POLITICAL AND ECONOMIC CRISES IN INTERNATIONAL POLITICAL ECONOMY

Editor
Prof. Dr. Arzu AL

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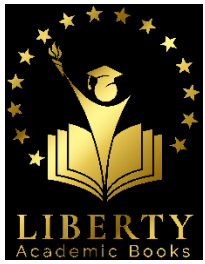

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PREFACE

This book emerged at a time when the international system has been shaken simultaneously at political, economic, and environmental levels. A succession of regional wars, increasingly fragile supply chains, the rise of economic nationalism, rapidly shifting energy and technology policies, and, in addition, the deepening climate crisis all of these developments reveal that global politics has become too multilayered and intertwined to be explained by old theoretical frameworks. This volume is the product of a shared intellectual effort to make sense of this complex transformation.

The book opens with the chapter *"Global Crises, National Interests and Geoeconomic Tensions: Transition from Liberal Order to Realist Governance"*, written by **Yusuf Girayalp ATAN** and **Arzu AL** This chapter provides the academic foundation for the volume, explaining why the liberal international order has begun to unravel, how multilateral institutions have lost influence, and under what conditions a new realist governance model one in which economic instruments move to the center of foreign policy has risen to prominence. It forms the conceptual backbone that runs throughout the entire book.

The following chapter, *"Climate Change as an Economic and Political Crisis in Nigeria"* by **Ahmed ATTAHIRU** shows that climate change is far more than an environmental concern. As demonstrated in the Nigerian context, it destabilizes the economy, social fabric, security landscape, and state capacity. The interplay between droughts, floods, migration, agricultural collapse, and local conflicts clearly reveals that climate change has become one of the most powerful "security threats" of the modern era.

Subsequent chapters examine key contemporary conflicts including the Russia-Ukraine war, the Azerbaijan-Armenia confrontation, the Iran-Israel tensions, and the India-Pakistan rivalry and demonstrate that wars today are fought not only on military fronts but also through energy corridors, trade routes, currency pressure, financial sanctions, technological rivalry, and supply chain disruptions. Each of these chapters illustrates, with concrete examples, how geopolitical competition has increasingly taken on a geoeconomic character.

In the later sections of the book, the focus turns to the United States, particularly under the second Trump administration, where economic instruments became the primary tools of foreign policy. Tariffs, investment restrictions, technology bans, and data policies all reveal that the line between economics and security has nearly disappeared.

Taken together, all chapters point to a clear conclusion:

The international system is drifting away from a cooperative liberal order and entering a new geoeconomic era built on competition, power, economic coercion, and strategic autonomy.

In this emerging reality where economic resilience, technological capability, energy security, and environmental vulnerability matter as much as military strength the classic boundaries of international relations have been fundamentally reshaped.

This book aims to serve as both a comprehensive resource and a reflection of the spirit of our time for students, researchers, academics, and policymakers. With its wide-ranging perspective from theory to practice, from great-power politics to local fragilities, from war economies to climate policy it offers a strong guide for anyone seeking to understand where global politics is headed.

Editor

Prof. Dr. Arzu AL

December 12, Türkiye

CHAPTER 1
GLOBAL CRISES, NATIONAL INTERESTS AND GEOECONOMIC TENSIONS: TRANSITION FROM LIBERAL ORDER TO REALIST GOVERNANCE

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INTRODUCTION

In recent years, the international system has entered a profound period of transformation shaped by the convergence of regional wars, institutional erosion, and escalating geopolitical tensions. This process has not only altered the architecture of global security but has also redefined economic governance, the role of institutions, and the foreign policy behavior of states. For decades, the liberal international order—built upon the principles of multilateralism, normative institutions, and economic interdependence—provided the dominant framework for international relations. Yet, as security-centered threats have multiplied and state-centric power calculations have gained prominence, the structural foundations of this order have steadily weakened.

The central concern of this study is to identify the structural causes behind the liberal order's disintegration and to interpret the concurrent rise of realist forms of governance that privilege power, sovereignty, and strategic competition over cooperation and institutional constraint. The wars and crises that have emerged in recent years—such as the Russia–Ukraine conflict, the Azerbaijan–Armenia confrontation, the Iran–Israel escalation, and the recurring clashes between India and Pakistan—are not isolated regional disturbances. Rather, they represent the visible expressions of a deeper paradigmatic shift in global politics, signaling the reassertion of realism as the organizing logic of international governance.

From this perspective, the study aims to offer both theoretical and empirical insights into the nature of the ongoing transformation. By focusing on the geoeconomic dimension of power politics, it examines how states increasingly employ economic tools—trade measures, investment regulations, and technology restrictions—as strategic instruments of foreign policy. This dynamic reflects a broader reinterpretation of classical realism, in which economic statecraft functions as a central mechanism of influence and control. The return of the Trump administration following the 2024 U.S. presidential elections has further accelerated this process, as renewed tariffs on China, the European Union, and various trade blocs, together with expanded investment and technology restrictions, have underscored the use of geoeconomic measures as tools of strategic rivalry.

The weakening of multilateral trade regimes and the instrumentalization of economic interdependence illustrate the erosion of liberal economic norms and the consolidation of realist governance in global economic relations.

Conceptually, the evolution of the international order can be understood through the interplay between the declining liberal framework and the resurgence of realist principles. While the liberal order rested on the foundations of multilateral cooperation and institutional legitimacy—embodied in organizations such as the United Nations, the World Trade Organization, and the International Monetary Fund—its stability has been undermined by growing insecurity and the prioritization of national interest. Realism, emphasizing the primacy of state power and the inseparability of security and economics, has regained both analytical and practical relevance in explaining contemporary global politics.

In this context, the notion of geoeconomics offers a crucial interpretive lens for understanding how economic capabilities are systematically mobilized for geopolitical objectives. As Robert Blackwill and Jennifer Harris define it, geoeconomics involves the strategic use of economic instruments to produce political effects. Similarly, Henry Farrell and Abraham Newman's work on the geopolitics of technological interdependence demonstrates how networks of connectivity and dependency can serve as sources of coercive leverage. These theoretical perspectives illuminate the mechanisms through which economic globalization has evolved from a liberalizing force into a domain of strategic competition.

Taken together, these developments suggest that the global order is undergoing a structural reconfiguration in which liberal norms of cooperation and interdependence are giving way to realist modes of governance grounded in power, autonomy, and geoeconomic rivalry. The contemporary international system thus appears to be evolving toward a multipolar configuration, where economic tools are increasingly weaponized and the logic of power politics extends beyond military conflict to encompass the very fabric of global economic relations.

1. THE FUNDAMENTAL PRINCIPLES OF THE LIBERAL INTERNATIONAL ORDER

Multilateralism has long been one of the defining pillars of the liberal international order. Over time, however, the concept has been interpreted differently by various actors, reflecting diverging views on its meaning and practice. For instance, Türkiye's foreign policy discourse increasingly portrays Western-centered multilateral frameworks as mechanisms of imposition rather than platforms for genuine cooperation. This critical stance suggests that Ankara does not reject the liberal order outright, but instead questions its conceptual foundations and seeks to articulate alternative forms of engagement (Börzel & Zürn, 2021).

Normative institutions such as the United Nations, the World Trade Organization, and the International Monetary Fund have traditionally been regarded as the structural backbone of global governance. For decades, they embodied the institutional expression of liberal norms and principles. Yet, recent developments—particularly within the European Union's trade policy—indicate a gradual erosion of unconditional commitment to these institutions. Although the EU continues to express formal adherence to WTO rules, its policy orientation increasingly reflects geostrategic calculations and interest-based pragmatism (Danzman & Meunier, 2023). A similar dynamic can be observed in the United States during the Trump administration, whose trade policies dealt a significant blow to the normative foundations of the WTO. The deliberate paralysis of the Appellate Body, in particular, raised questions about Washington's long-term commitment to liberal institutionalism (Ben-Achour, Shin & Carolipio, 2018).

Economic interdependence, another cornerstone of the liberal order, has also become a subject of intense debate regarding both its functionality and desirability. In the case of Türkiye, the recurring emphasis on "strategic autonomy" in official discourse reflects a gradual reorientation away from Western-centered economic linkages and toward the cultivation of alternative partnerships (Aydın-Düzgit, Kutlay & Keyman, 2025). More broadly, the liberal order's reliance on open markets and reciprocal dependence has come under increasing pressure amid the global rise of populism and growing dissatisfaction with democratic governance.

Such trends have weakened the domestic and international legitimacy of liberal economic frameworks, posing a serious challenge to their sustainability (Lake, Martin & Risse, 2021).

Taken together, these developments suggest that the normative, institutional, and economic pillars of the liberal international order are no longer uncontested. The reemergence of strategic considerations within multilateral and economic domains marks a shift away from the liberal vision of interdependence toward a more fragmented and realist-oriented international environment.

2. THE LOGIC OF REALIST GOVERNANCE

The gradual disintegration of the liberal international order has brought to the forefront a governance model grounded in the core principles of realism. Confronted with growing security threats and global instability, states have increasingly framed their foreign policies around power competition, geoeconomic strategy, and the pursuit of strategic autonomy. This reassertion of classical realist assumptions—adapted to contemporary conditions—demonstrates how power politics, state-centrism, and the interplay between security and economics are once again shaping the international system in decisive ways.

From the realist perspective, the anarchic nature of the international system compels states to engage in perpetual struggles for power and survival. In this logic, the state remains the central and most rational actor, while international norms and institutions exert influence only to the extent that they align with the interests of powerful states. As early realist thinkers such as Hans Morgenthau (1948) and Robert Gilpin (2001) emphasized, stable cooperation in world politics is possible only when the balance of interests and power is preserved. In contemporary practice, the growing state intervention in strategic industries, the retreat from open markets, and the resurgence of protectionist policies all signal the institutionalization of state-centric and power-oriented modes of governance (Babić, Herranz Surrallés, Rosén & Meunier, 2024).

Realist governance today is not confined to military strategy but extends deeply into the economic realm. States now employ geoeconomic instruments—trade, energy, technology, and investment—as direct tools of

foreign policy. Geoeconomics, in this sense, refers to the deliberate use of economic activity to achieve geopolitical ends. Major powers increasingly reorganize patterns of economic interdependence to safeguard national interests, seeking greater control over investments, supply chains, and technological flows (Oxford Economic Review, 2024). This convergence of economic and security domains illustrates the fading distinction between the two and underscores the multidimensional nature of contemporary strategic decision-making (Babić et al., 2024).

The relationship between security and economics, once treated as distinct spheres, is now understood—within realist thought—as intrinsically intertwined. States are no longer focused solely on promoting economic growth or prosperity; they increasingly view economic resources as vital components of national security. This is particularly evident in debates over energy dependence, digital infrastructure, and access to critical technologies. As Hsiung (2009) argues, economic power has become as strategically significant as military strength, signaling a transformation in the logic of global competition. Accordingly, realist governance has evolved into a model that produces power-based responses not only to military threats but also to economic vulnerabilities (Babić et al., 2024).

The theoretical relationship between geoeconomic strategy and realism can be examined across three main strands: economic realism, neoclassical realism, and structural realism. In classical realism, power was primarily defined in military terms, while economic capacity occupied a secondary position. However, Edward Luttwak's (1990) claim that "the logic of geoeconomics is replacing the logic of geopolitics" called for a reinterpretation of realism in light of the changing nature of power. Neoclassical realism provided a more flexible framework by integrating internal state capacities—such as institutional strength, economic resilience, and technological competence—with systemic pressures in shaping foreign policy (Wohlforth, 1993). Within this framework, geoeconomics emphasizes that power can be constructed not only through hard instruments but also through trade, investment, energy, and financial leverage.

Recent contributions have further deepened this synthesis. David Baldwin's (2020) focus on "economic state capacity" and Scholvin and Wigell's (2022) conceptualization of geoeconomics as a rule-shaping domain both demonstrate how economic instruments have become integral to realist forms of governance. In this light, the present study interprets the integration of geoeconomic tools into security logic as a contemporary manifestation of realism—one that reflects the structural adaptation of power politics to the economic realities of the twenty-first century.

3. THE CONCEPT OF GEOECONOMICS

Geoeconomics represents an updated and expanded interpretation of classical realism's understanding of foreign policy. The concept refers to the strategic use of economic instruments to achieve political and security objectives. Unlike traditional geopolitical approaches that emphasize military power and territorial control, geoeconomics highlights the growing significance of economic power in shaping state behavior. In the contemporary international system, competition among major powers extends far beyond the military domain, encompassing areas such as trade, investment, technology, and energy. This evolution underscores the extent to which geoeconomic thinking has become central to the formulation and execution of foreign policy.

When compared to geopolitics, geoeconomics offers a distinct yet complementary lens for understanding state strategy. Geopolitics focuses primarily on the projection of power through geography, territory, and military capability, whereas geoeconomics derives influence from economic interdependence, market access, and financial leverage. Rather than existing in opposition, these two frameworks often operate in tandem, shaping a hybrid strategic logic that defines statecraft in the twenty-first century. Increasingly, rising powers have demonstrated a preference for economic instruments—such as sanctions, export restrictions, infrastructure investment, and debt diplomacy—over direct military engagement as means of extending influence and securing strategic interests (Farrell & Newman, 2019).

The modern conception of geoeconomics thus reveals that economic tools are no longer confined to promoting development or prosperity; they are systematically employed as strategic levers of foreign policy.

Through mechanisms such as investment screening, control over supply chain dependencies, and the export of digital infrastructure, states transform economic relations into instruments of geopolitical power. This dynamic has become particularly visible in the strategic rivalry between the United States and China. Sanctions targeting technology firms, restrictions on high-tech exports, and regulatory measures against foreign investment in critical sectors all demonstrate how economic capacity has been redefined as an essential component of national power (Blackwill & Harris, 2016).

This strategic transformation in economic relations not only reconfigures patterns of interdependence but also incorporates the management of economic vulnerabilities into the core logic of foreign policy. As a result, the boundary between economic and security domains continues to blur, marking a decisive shift toward a world where power is increasingly exercised through markets, technologies, and networks rather than through conventional military means.

4. CONTEMPORARY DEBATES IN THE LITERATURE

One of the most influential contributions to the study of geoeconomics is the analysis developed by Robert Blackwill and Jennifer Harris, who define geoeconomics as the deliberate, coordinated, and long-term use of economic instruments by states to achieve strategic objectives in international politics (Blackwill & Harris, 2016). Their approach conceptualizes geoeconomics as a form of power projection that serves as an alternative to direct military intervention. In this view, economic tools—ranging from trade policy and investment controls to financial sanctions—function as instruments through which states can pursue geopolitical influence without resorting to force.

A complementary yet distinct perspective is offered by Henry Farrell and Abraham Newman (2019), who emphasize the structural asymmetries of economic interdependence in the digital era. They argue that global networks of data, technology, and finance have created new hierarchies of dependence, enabling powerful actors to weaponize these asymmetries for strategic purposes. In this context, flows of information, digital platforms, and technological infrastructures are no longer seen merely as economic assets but as integral components of national and international security.

The recent literature thus illustrates a growing convergence between realist theory and the study of geoeconomic governance. By situating economic interdependence within broader power relations, these analyses suggest that geoeconomics has evolved into a new paradigm of international governance—one that blends classical realist insights about power and security with the structural realities of a globalized and digitized economy.

5. LITERATURE REVIEW

In recent decades, the discipline of international relations has engaged in extensive theoretical and empirical debates concerning the sustainability of the liberal order, the resurgence of realism, and the geoeconomic transformations shaping global politics. This section aims to strengthen the theoretical foundations of the study by reviewing key discussions surrounding the crisis of the liberal international order, the contemporary revival of realism, emerging approaches to geoeconomic governance, and the structural transformations unfolding within the international political economy.

The crisis of the liberal order has been one of the most prominent themes in recent scholarship. The liberal international order that emerged after the Cold War was built upon multilateral institutions, open market economies, and democratic norms. Yet, by the twenty-first century, both its normative power and structural coherence had come under strain. Fareed Zakaria (2019) argues that liberalism has become increasingly incapable of competing with authoritarian models, attributing this weakness to internal political crises within the West and its exclusionary foreign policies. While G. John Ikenberry (2018) acknowledges that the liberal order is in decline, he contends that it has not collapsed entirely but is instead undergoing a profound process of revision. Joseph Nye (2020) similarly notes that the erosion of normative authority has expanded the space for power-based politics, paving the way for renewed great-power competition.

The return of realism has accompanied the weakening of liberal institutions and the intensification of global crises. John Mearsheimer (2018) maintains that the international system is inherently anarchic and that states, seeking to ensure their survival, inevitably strive to maximize power.

Stephen Walt (2019) similarly argues that realism remains the most robust explanatory framework for understanding international behavior, particularly by exposing the limits of cooperation and distinguishing itself from liberal idealism. Together, these perspectives provide a compelling basis for interpreting the current global environment, in which states increasingly prioritize national interest and security over normative commitments.

The concept of geoeconomic governance represents an important extension of realist thought, reinterpreting traditional foreign policy strategies through the systematic use of economic tools. David Baldwin (1985) highlights that states do not rely solely on military power but also on economic inducements and sanctions as means of achieving strategic objectives. Scholvin (2016) links geoeconomics to the positioning of states within global value chains, while Edward Luttwak (1990) famously conceptualizes it as "the logic of conflict in the grammar of commerce." These approaches collectively underscore the growing centrality of economic statecraft in contemporary international relations, where states increasingly seek to transform economic dependencies into sources of strategic advantage.

Parallel to these developments, the structural transformation of the international political economy has emerged as a focal point of recent scholarship. As globalization becomes more fragile, economic nationalism intensifies, and international institutions face crises of legitimacy, scholars have begun to identify a paradigmatic shift at the systemic level. The structuralist tradition initiated by Susan Strange (1996) provides an analytical foundation for this transformation by examining the underlying power structures that govern international economic relations. More recent contributions draw attention to the expanding role of the state in the economy, the strategic reconfiguration of industrial policy, and the reorganization of regional supply chains in response to geopolitical concerns (Hopewell, 2021; Farrell & Newman, 2022). Together, these trends suggest that liberal globalization is giving way to a more fragmented, multipolar, and strategically managed global economy.

This study does not merely align itself with one side of these theoretical divisions but seeks to make an original contribution by analyzing the conceptual fault line between realism and liberalism through the lens of

geoeconomics. For instance, Mearsheimer (2001) explains that in an anarchic system, states are compelled to pursue power maximization as a survival strategy, whereas Nye (2004) contends that interdependence and soft power make cooperation both feasible and desirable. By examining empirical cases where economic instruments are deployed for foreign policy objectives, this study demonstrates that realist forms of governance increasingly prevail over institutional liberalism. Thus, rather than merely applying existing theories, the analysis seeks to reveal their limitations by offering a case-based framework that bridges theoretical inquiry and practical dynamics in the evolving global order.

5. METHODOLOGY

This study adopts the **comparative case study** method in order to examine how the structural transformation of the international system has unfolded within the framework of realist governance. The method allows for a nuanced understanding of how complex political and economic processes take shape across different contexts, while also enabling the derivation of theoretical insights from empirical evidence. By combining qualitative analysis with contextual comparison, the approach facilitates an exploration of both the specific characteristics of each case and the broader structural patterns that link them.

Case Selection Criteria

The cases included in this analysis—Russia–Ukraine, Azerbaijan–Armenia, Iran–Israel, and India–Pakistan—were selected on the basis of three principal criteria:

- Presence of sustained geopolitical rivalry: Each case represents a long-standing pattern of security tensions and regional power competition that has persisted over time, reflecting the enduring nature of strategic conflict in the international system.
- Use of economic instruments as tools of foreign policy: In every case, geoeconomic strategies are observable either in direct forms—such as sanctions, energy supply restrictions, or embargoes—or in indirect

forms, including financial pressure, investment barriers, and the weaponization of trade relations.

- Impact on regional and global systems: The selected conflicts have produced multilayered consequences that extend beyond their immediate locales, influencing international security, energy supply chains, trade routes, and the effectiveness of institutional actors at both regional and global levels.

These criteria provide a coherent basis for applying John Stuart Mill's "method of difference", which facilitates systematic comparison across cases that share similar independent variables but diverge in specific outcomes. Each case thus offers distinctive empirical insights into the interaction between conflict dynamics and the use of economic instruments as mechanisms of governance. Together, they illuminate how realist modes of statecraft operate across varying geopolitical and geoeconomic environments, contributing to a broader understanding of the ongoing transformation of global order.

Data Sources

This study relies exclusively on secondary data. Within this framework, several categories of sources have been systematically reviewed and analyzed:

- Strategic reports published by leading international think tanks such as the *Brookings Institution*, *RAND Corporation*, and the *Institute for the Study of War (ISW)*;
- Peer-reviewed academic articles from journals specializing in international relations, political economy, and security studies;
- Reputable media analyses offering economic and geopolitical insights, including those from *The Financial Times*, *Reuters*, and *Foreign Policy*;
- Assessment and policy documents released by intergovernmental organizations such as the *United Nations (UN)*, the *North Atlantic Treaty Organization (NATO)*, and the *International Monetary Fund (IMF)*.

By integrating these diverse sources, the study aims not only to strengthen its theoretical foundations but also to provide an empirically grounded account of the multidimensional nature of geoeconomic transformation.

This approach enables a comprehensive understanding of how economic, political, and institutional dynamics intersect within the evolving framework of realist governance in the international system.

6. CASE ANALYSES: THE RISE OF GEOECONOMIC RIVALRY

Following the theoretical discussion on the disintegration of the liberal international order and the rise of geoeconomic governance, this section presents the empirical reflections of these transformations. It investigates how realist governance has become institutionalized through geoeconomically oriented tools and how states have aligned their economic capacities with foreign policy objectives. The selected case studies—the Russia–Ukraine War, the Azerbaijan–Armenia Conflict, the Iran–Israel Tensions, and the India–Pakistan Rivalry—illustrate the intersection between geopolitical competition and the strategic use of economic instruments. Collectively, these cases demonstrate that geoeconomic rivalry is not confined to regional politics but has evolved into a phenomenon capable of reshaping the very structure of global governance. Each case focuses on different dimensions of geoeconomics—such as energy security, trade routes, monetary policy, and technology transfer—thereby enabling the empirical testing of the study's theoretical propositions.

6.1 The Russia–Ukraine War

The Russia–Ukraine War represents far more than a conventional military conflict; it constitutes a multidimensional crisis that has profoundly reshaped the geopolitical, geoeconomic, and financial architecture of the international system. NATO's eastward expansion, disruptions in global energy markets, and Russia's attempts to position the ruble as a regional currency all underscore how the war's impact extends well beyond the battlefield into the spheres of economic and monetary power.

NATO Expansion and the Security Dilemma

Ukraine's growing proximity to NATO membership was perceived by Russia as a direct security threat, reigniting the classical security dilemma.

NATO's enlargement intensified Moscow's sense of encirclement, prompting countermeasures that were, in turn, perceived as threatening by NATO member states. This mutual cycle of fear and reaction produced a self-reinforcing dynamic of escalation—a "vicious circle" that has long been recognized in realist security theory (Glaser, 1997; George & Sandler, 2022). The war thus reflects the enduring structural logic of realism, wherein power accumulation by one actor generates insecurity in others, ultimately heightening the probability of conflict.

Energy Markets and Sanctions

In the post-2022 period, the crisis of European dependence on Russian natural gas became a central dimension of the international sanctions regime. Western powers, led by the European Union and the United States, imposed sweeping restrictions on Russian energy exports, including price caps, logistical constraints, and sanctions targeting critical supply chains. These measures triggered global volatility in energy prices and disrupted the balance of supply and demand (Hopewell, 2022; CNAS, 2024).

Energy sanctions, however, have functioned not only as economic constraints but also as strategic instruments of coercion. In response, Russia developed indirect channels to sustain its energy exports, utilizing alternative trade routes and intermediary partners to circumvent embargoes (Oxford Economic Review, 2024). The weaponization of energy thus became a defining feature of the conflict, demonstrating how economic interdependence can be transformed into a domain of strategic confrontation.

The Ruble as a Regional Currency

Another critical dimension of Russia's geoeconomic strategy has been its effort to elevate the ruble into a regional transaction currency as part of a broader attempt to achieve financial autonomy. Following restrictions on trade denominated in dollars and euros, Moscow introduced a series of policies requiring the use of the ruble in export contracts and encouraging partner states to settle energy imports in the Russian currency. By the end of 2024, ruble-denominated exports accounted for over 50 percent of Russia's total trade, rising to 56.2 percent by April 2025 (International Finance Journal, 2025).

This shift signals an emerging strategy of monetary sovereignty, whereby Russia seeks to reduce its vulnerability to Western financial systems and sanctions. In doing so, the ruble's regionalization exemplifies a broader trend in global geoeconomics: the fragmentation of international financial order and the gradual weakening of dollar and euro hegemony in specific regional contexts.

6.2 The Azerbaijan–Armenia Conflict

The conflict between Azerbaijan and Armenia over Nagorno-Karabakh is not merely an ethnic or territorial dispute; it constitutes a multilayered struggle shaped by regional power dynamics, energy corridors, and geoeconomic interests. Beyond its military dimension, the conflict reflects the intersection of strategic competition and economic statecraft in the South Caucasus—a region where geography, resources, and infrastructure converge as instruments of influence. The involvement of regional actors such as Türkiye, Russia, and Iran further situates this confrontation within a complex geopolitical framework. Energy security, transportation routes, and infrastructural connectivity have all emerged as decisive elements of geoeconomic rivalry.

Energy Corridors and Transit Competition

The South Caucasus occupies a critical geographic position as a transit hub for Caspian energy resources destined for European markets. The Baku–Tbilisi–Ceyhan (BTC) oil pipeline and the Southern Gas Corridor, both traversing Azerbaijan, serve not only as conduits of energy but also as vectors of geopolitical influence. Armenia's exclusion from these routes and Azerbaijan's integration with Western-oriented energy policies have enhanced the strategic significance of economic infrastructure in the conflict. Türkiye's strong political and military support for Azerbaijan has, in turn, fostered a geoeconomic alliance aimed at safeguarding these projects and reinforcing regional connectivity (Kinnunen, 2022; Cornell, 2021). The resulting configuration underscores how energy networks have become instruments of power projection, linking economic capacity with geopolitical strategy.

The Zangezur Corridor Debates

One of the most contentious outcomes of the 2020 Nagorno-Karabakh ceasefire agreement has been the debate surrounding the proposed Zangezur Corridor, which envisions a transportation route connecting mainland Azerbaijan with the Nakhchivan Autonomous Republic and, ultimately, with Türkiye and Central Asia. This project carries both geopolitical and geoeconomic implications. For Azerbaijan, it represents a means of consolidating territorial continuity and deepening regional trade integration. Armenia, however, perceives the corridor as a potential threat to its sovereignty and territorial integrity, while Iran expresses concern that the initiative could establish a geoeconomic axis that marginalizes its regional role (Hakobyan, 2023). The Zangezur Corridor thus exemplifies how transnational infrastructure projects can reshape post-conflict peace processes, transforming economic connectivity into a new arena of strategic negotiation.

Regional Powers and Economic Influence

Even actors not directly engaged in the hostilities—most notably Russia and Iran—have sought to preserve their influence through the calibrated use of economic instruments. Russia, despite its formal security commitments to Armenia through the Collective Security Treaty Organization (CSTO), continues to maintain energy partnerships with Azerbaijan, reflecting a pragmatic approach to balancing its regional interests. Iran, for its part, has pursued railway initiatives and trade agreements with Armenia as part of a broader effort to sustain equilibrium in the South Caucasus (Shiriyev, 2023). These dynamics reveal how geoeconomic tools increasingly blur the boundaries between alliance politics and competitive statecraft.

Ultimately, the Azerbaijan–Armenia conflict demonstrates that realist governance in the contemporary era operates through complex, multidimensional relationships in which economic and geopolitical interests are deeply intertwined. The South Caucasus thus serves as a telling illustration of how regional rivalries are being redefined not only by territorial or military considerations but by the strategic mobilization of infrastructure, energy, and trade as instruments of national power.

6.3 The Iran–Israel Tensions

The armed confrontation between Iran and Israel from 13 to 24 June 2025 emerged as one of the most consequential crises of recent years, distinguished by its intertwined military and geoeconomic dimensions. When examined through the lenses of nuclear capability, energy security, and regional power competition, this conflict provides a contemporary example of how realist governance and geoeconomic instruments have become deeply interwoven in international affairs.

On 13 June 2025, Israel launched a series of airstrikes targeting Iran's nuclear facilities in Fordow, Natanz, and Isfahan, with the declared objective of constraining Iran's uranium enrichment capacity (Institute for the Study of War, 2025). In retaliation, Iran carried out ballistic missile and drone attacks on Tel Aviv, Haifa, and their surrounding areas, rapidly escalating the confrontation into a regional security crisis with global implications (RAND Corporation, 2025).

The geoeconomic repercussions of these clashes were most immediately felt in global energy markets. Within a single week, Brent crude oil prices rose by 7 percent, while tanker insurance premiums surged amid heightened security risks in and around the Strait of Hormuz (Reuters, 2025). Publications such as The Financial Times and The Guardian reported that the resulting energy supply crisis evolved into a "geoeconomic shock" that rippled through global markets far beyond the Middle East (Financial Times, 2025; Guardian, 2025). Analyses from think tanks including Columbia SIPA and the Brookings Institution emphasized that the deliberate targeting of energy infrastructure effectively integrated the energy sector into military strategy, exacerbating existing geoeconomic vulnerabilities (Brookings Institution, 2025).

A RAND Corporation assessment characterized the June 2025 hostilities as a limited war, conducted under conditions of close U.S.–Israeli military coordination (RAND Corporation, 2025). Experts at Brookings similarly argued that the confrontation produced multidimensional consequences—not only military, but also diplomatic, energy-related, and infrastructural—revealing the extent to which economic and strategic considerations have become inseparable (Brookings Institution, 2025).

The June 2025 Iran–Israel conflict thus stands as a striking case illustrating how economic instruments can be deployed as strategic tools of foreign policy within a framework of power politics. The abrupt volatility in global energy markets demonstrated that military operations now pose direct threats to economic security, underscoring the emergence of geoeconomic governance as a defining paradigm for understanding contemporary global crises.

6.4 The India–Pakistan Conflict

Between 7 and 10 May 2025, a deadly terrorist attack in Pahalgam triggered one of the most severe security crises between India and Pakistan in recent decades. In response to the incident, India launched "Operation Sindoor," a series of missile strikes targeting nine locations inside Pakistan (Stimson Center, 2025). Pakistan retaliated with drone and missile attacks on Indian border areas, resulting in localized clashes along the frontier (Global Conflict Tracker, CFR, 2025). The confrontation, though limited in duration, represented the most intense escalation between the two nuclear-armed neighbors in years (Stimson Center, 2025; CFR, 2025).

The regional geoeconomic impact of the crisis was immediate. Pakistan temporarily closed its airspace, imposed trade restrictions, and prompted major credit rating agencies such as Moody's to reassess regional risk exposure. Moody's noted that while the episode tested India's economic resilience, the country's credit standing remained stable (Moody's, 2025). On the diplomatic front, India pursued an active strategic communication campaign, framing Pakistan as a state sponsor of terrorism in international forums (Financial Times, 2025). In turn, Pakistan sought to preserve its autonomy over oil, energy, and financial sectors, adopting countermeasures that aligned economic sovereignty with national defense (Washington Post, 2025). Both countries, in effect, integrated economic instruments into the logic of foreign policy, transforming the crisis into a contest of geoeconomic statecraft.

Beyond military coordination, the conflict extended into the economic and infrastructural domains. Border trade routes were temporarily shut down, while control over water resources and airspace operations became components of strategic leverage.

These measures exemplify how realist governance—grounded in strategic autonomy and economic security—materializes through concrete geoeconomic practices (Zoo al-Taher & Stimson Center, 2025).

The May 2025 India–Pakistan crisis thus provides a compelling and contemporary illustration of the study's core argument. The conflict's scope transcended the military realm, encompassing economic strategies linked to trade routes, airspace management, energy supplies, and water security. Both states employed economic coercion not as secondary policy instruments but as central mechanisms of national strategy. This shift demonstrates a broader departure from the liberal order's principles of economic interdependence and cooperative engagement, marking a transition toward national interest–driven, multidimensional crisis management.

Much like the Iran–Israel and Russia–Ukraine confrontations, the India–Pakistan case underscores that power politics now extends well beyond the battlefield, embedding itself within economic, infrastructural, and financial arenas. It stands as a structural indicator of the ongoing transformation toward a realist governance paradigm, in which geoeconomic competition has become an indispensable dimension of global security dynamics.

7. THE RISE OF ECONOMIC INSTRUMENTS IN U.S. FOREIGN POLICY

Following the return of the Trump administration after the 2024 U.S. elections, Washington's foreign policy entered a new phase in which economic tools became not merely instruments of trade regulation but strategic levers of geopolitical and security policy. This orientation reflects a deliberate institutionalization of the geoeconomic dimension of realist governance, in which power is exercised through economic interdependence and coercive leverage. Tariffs, technology embargoes, and investment restrictions have thus evolved into mechanisms of strategic influence—targeted not only at China but also at key U.S. allies in the European Union.

Tariffs and Technology Embargoes

In 2025, the administration introduced universal tariffs ranging from 10 to 25 percent, primarily affecting strategic industries such as steel, automotive manufacturing, and semiconductors (Economic Policy of the Second Trump Administration, 2025). While initially presented as measures to address trade imbalances, the tariffs also imposed significant economic costs on major European exporters, including Germany, France, and Italy. Concurrently, the United States imposed restrictions on data transfers and artificial intelligence hardware originating from Europe, accelerating a security-driven fragmentation of transatlantic technology supply chains (Financial Times, 2025). These developments indicate a structural shift in U.S. economic diplomacy—from liberal market coordination toward strategic decoupling based on national security imperatives.

Investment Restrictions and the China–EU Nexus

A presidential executive order issued in February 2025 further constrained Chinese investment in critical sectors of the U.S. economy, including advanced manufacturing, digital infrastructure, and energy (US Sanctions Against China, 2025). Simultaneously, ongoing investment negotiations with the European Union were suspended, signaling a broader retreat from multilateral economic engagement. The European Commission responded by reviving its discourse on “strategic autonomy,” emphasizing the need to reduce dependence on the United States in defense and energy sectors (FT News Briefing, 2025). This episode marked a clear inflection point in transatlantic relations, illustrating how U.S. economic nationalism had begun to reshape both global governance patterns and intra-Western strategic alignment.

Economic Leverage and European Security

The Trump administration also integrated economic pressure into its European security policy. Reviving long-standing debates over burden-sharing within NATO, Washington demanded that Germany and other European members increase defense expenditures or face potential reductions in U.S. military commitments.

These statements not only reignited concerns over NATO's internal cohesion but also blurred the boundary between economic and defense diplomacy (Washington Post, 2025). The administration's rhetoric demonstrated that trade and security could function as interlinked instruments of leverage, illustrating a broader trend in which economic statecraft has become an extension of foreign and defense policy (Brookings Institution, 2025).

Neo-Protectionism and the National Security Paradigm

The Trump administration's approach extends beyond conventional protectionism; it embodies what might be termed "economic nationalism"—a paradigm in which economic autonomy and industrial capacity are redefined as pillars of national security. A White House directive issued in April 2025 explicitly identified *economic independence* and *productive strength* as "core elements of national security," legitimizing tariffs and investment screenings as tools to reinforce strategic sovereignty (White House Fact Sheet, 2025). Within this framework, the discourse of "trade" gave way to that of "power balance", marking a conceptual realignment in which economic instruments are not merely adjuncts to diplomacy but central mechanisms of state power and strategic competition.

8. FINDINGS AND DISCUSSION

The theoretical framework and case analyses presented in this study demonstrate that the ongoing transformation of the international system is not a temporary disruption but a structural reconfiguration shaped by geoeconomic competition. The findings indicate a steady erosion of the foundational pillars of the liberal international order—multilateralism, institutional norms, and economic interdependence—and their gradual replacement by a state-centered, power-driven model of realist governance underpinned by geoeconomic instruments.

The Expansion of Power Politics into the Economic Realm

Traditionally confined to military and diplomatic arenas, power politics has increasingly migrated into the economic domain.

The Trump administration's deployment of tariffs, technology embargoes, and investment controls was not limited to protecting trade interests; rather, these measures were pursued within a broader framework of national security and strategic rivalry (York & Durante, 2025; White House Fact Sheet, 2025). Similarly, in the Iran–Israel and India–Pakistan cases, the deliberate targeting of energy infrastructure and cross-border trade demonstrated how economic capabilities have evolved into instruments of conflict and deterrence (Brookings Institution, 2025; Stimson Center, 2025). The economy, in this sense, has become an extension of state power, serving both coercive and defensive purposes.

The Weakening of Institutional Liberalism

Across all examined cases, normative international institutions—such as the United Nations, the World Trade Organization, and the International Monetary Fund—were shown to have limited influence in mitigating crises or constraining state behavior. In the aftermath of Russia's invasion of Ukraine, for instance, the UN's diplomatic effectiveness remained minimal, while state-led measures such as sanctions, energy restrictions, and financial isolation dominated the international response (Reuters, 2025; ISW, 2025). This reveals that the erosion of institutional liberalism is no longer merely rhetorical but has manifested at the operational level, signaling a deeper loss of legitimacy and capacity among the institutions that once underpinned global governance.

The Quest for Strategic Autonomy

The case studies further reveal an expanding drive among states to achieve strategic autonomy by reducing geoeconomic dependencies. The European Union's emphasis on "technological sovereignty" vis-à-vis the United States, China's promotion of ruble–yuan trade mechanisms, and India's integration of border security with trade policy all exemplify this trend (Financial Times, 2025; RAND Corporation, 2025). Strategic autonomy now extends beyond traditional sectors such as defense or energy; it increasingly encompasses digital infrastructure, finance, and data governance, reflecting a broader redefinition of state sovereignty in geoeconomic terms.

The Geoeconomic Foundations of Multipolarity

Finally, the crises and policy shifts analyzed in this study suggest that the international system is evolving toward a multipolar, competitive, and fragmented configuration. Yet this new multipolarity is not solely determined by military balances of power; it is being constructed through economic capacity, regional trade networks, and the integration of technological and industrial systems—a form of geoeconomic multipolarity (Scholvin & Wigell, 2022; Baldwin, 2020). Within this emerging order, economic instruments have ceased to function merely as auxiliary tools; they have assumed order-constituting significance, occupying a central place in foreign policy and global governance.

In sum, the findings affirm that the contemporary international landscape is characterized by a shift from liberal interdependence to realist interdependence—a paradigm in which the pursuit of power, security, and autonomy increasingly unfolds through economic means.

CONCLUSION AND EVALUATION

This study has demonstrated that contemporary global crises and geopolitical tensions are not isolated disruptions but manifestations of a structural transformation within the governance architecture of the international system. The foundational principles of the liberal international order—multilateralism, normative institutions, and economic interdependence—are undergoing significant erosion under the combined pressures of security-driven rivalries and geoeconomic competition. In their place, a new configuration of realist governance has emerged, characterized by state-centered calculations of interest and the strategic fusion of power politics with economic instruments.

The conflicts examined—Russia–Ukraine, Iran–Israel, Azerbaijan–Armenia, and India–Pakistan—illustrate not only patterns of regional instability but also the rise of a global order in which economic strategies have become integral components of foreign policy. Developments across domains such as energy, technology, trade corridors, and investment flows reveal that contemporary conflicts are increasingly defined by economic power struggles rather than purely military confrontations.

These dynamics blur the conventional divide between security and economics, underscoring the growing necessity for interdisciplinary analysis in international relations.

Particularly since 2024, the foreign policy of the second Trump administration has exemplified the integration of economic instruments into explicitly geostrategic objectives. The United States' use of trade tariffs, investment restrictions, and technology controls—targeting not only China but also European allies—has weakened the flexibility of the multilateral system and prompted actors such as the European Union to pursue greater strategic autonomy. This shift signifies a broader transformation from normative centrality to interest-based governance, where the logic of competition supersedes that of cooperation.

The overarching conclusion of this study is that current crises do not represent temporary anomalies; rather, they constitute evidence of a systemic reorganization of the international order around the principles of realist governance and geoeconomic power. The accelerating use of economic tools as mechanisms of statecraft reflects the consolidation of a world system driven by national interest, strategic leverage, and power asymmetry.

In doing so, this research contributes both theoretically and empirically to the literature on international political economy, particularly regarding structural transformation, state strategy, and multipolarity. While existing scholarship often treats liberalism and realism as normative opposites, the present analysis bridges these paradigms empirically by examining how geoeconomic practices expose the operational limits of institutional liberalism. The findings suggest that global governance is no longer sustained by cooperative ideals but by the strategic management of economic interdependence—a defining feature of the emerging realist era in world politics.

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CHAPTER 2
CLIMATE CHANGE AS AN ECONOMIC AND POLITICAL CRISIS IN NIGERIA

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INTRODUCTION

Climate change has emerged as one of the most profound challenges confronting Nigeria, presenting not only environmental hazards but also far-reaching economic and political crises. As Africa's most populous country and largest economy, Nigeria faces multidimensional climate risks including desertification in the north, flooding and sea level rise in the south, and the shrinking of Lake Chad in the northeast. These hazards interact with preexisting structural vulnerabilities such as oil dependency, poverty, weak infrastructure, and fragile governance, producing severe implications for livelihoods, security, and fiscal stability. Economically, climate change undermines agriculture, fisheries, and forestry, sectors that employ millions of Nigerians, while flooding and extreme weather damage infrastructure and disrupt markets. Oil and gas, the mainstay of Nigeria's economy, are increasingly threatened by both physical risks and declining global demand driven by the energy transition. Public health costs, food inflation, and adaptation expenditures further strain the economy, with projections indicating potential GDP losses of up to 30 percent by 2050. Politically, climate change intensifies farmer herder conflicts, exacerbates insurgency in the Lake Chad region, fuels migration, and strains governance capacities. Climate justice dimensions are evident in the disproportionate impacts on women, children, and marginalized communities. Nigeria's position in global climate politics reflects tensions between its vulnerability to climate shocks and its dependence on fossil fuel revenues, complicating its energy transition commitments under the Paris Agreement. This chapter argues that climate change represents an existential crisis for Nigeria, threatening both development and stability. It emphasizes the urgent need for integrated adaptation, mitigation, and governance reforms, alongside a just energy transition, to safeguard livelihoods, strengthen resilience, and ensure sustainable national development.

Climate change has emerged as one of the defining challenges of the twenty first century, disrupting ecosystems, undermining economies, and threatening social and political stability worldwide. Nowhere are these dynamics more apparent than in Nigeria, Africa's most populous nation and largest economy, where climate change constitutes far more than an environmental concern.

It is an economic and political crisis that threatens the very foundations of national development, social cohesion, and governance. Nigeria's geographic position and ecological diversity make it particularly vulnerable to climate risks. From the advancing desertification in the arid Sahelian north to the increasing flooding and sea level rise affecting the humid rainforests and mangrove swamps of the south, the country faces a wide spectrum of interconnected hazards including rising temperatures, erratic rainfall, droughts, land degradation, and biodiversity loss (Intergovernmental Panel on Climate Change [IPCC], 2021).

These hazards intersect with Nigeria's deep structural vulnerabilities. The country remains heavily dependent on oil revenues, which constitute over 80 percent of government export earnings, leaving the economy exposed to both environmental and market shocks. Widespread poverty, entrenched food insecurity, inadequate infrastructure, and fragile political institutions further magnify the destabilizing effects of climate change. Crucially, environmental stresses amplify preexisting conflicts and grievances, such as farmer herder clashes in the Middle Belt, violent insurgencies in the northeast linked to the shrinking Lake Chad Basin, and resource tensions in the Niger Delta (United Nations Development Programme [UNDP], 2021). Climate change thus operates simultaneously as a direct driver of economic disruption and as an indirect multiplier of political instability.

Economically, the impacts are profound and multidimensional. Agriculture, which employs more than one third of Nigeria's labor force, is increasingly undermined by erratic rainfall, recurrent droughts, and flooding that destroy crops and livestock. Climate projections indicate significant reductions in staple crop yields, including maize, sorghum, millet, and rice, thereby threatening food security and rural livelihoods (World Bank, 2022). Fisheries, particularly in the Lake Chad Basin and coastal zones, are collapsing due to warming waters, reduced freshwater inflows, and habitat loss. Simultaneously, oil infrastructure in the Niger Delta, the backbone of the national economy, is threatened by flooding, sea level rise, and environmental degradation, while global decarbonization efforts accelerate the decline in fossil fuel demand.

Fiscal stability is further weakened as climate adaptation costs mount, even as oil revenues the lifeblood of the federal budget are projected to decline sharply in coming decades. Nigeria thus faces the twin economic challenges of managing immediate climate damages while transitioning away from hydrocarbon dependency.

Politically, climate change aggravates existing tensions and governance pressures. Desertification and drought have displaced millions in northern states, fueling migration to urban centers and intensifying competition over farmland and water resources. Farmer herder conflicts, which have escalated in recent decades, are increasingly recognized as climate-linked disputes over dwindling natural resources (Okoli & Atelhe, 2021). The shrinking of Lake Chad, which has lost over 90 percent of its surface area since the 1960s, has devastated regional livelihoods, undermined food systems, and created fertile ground for insurgent groups such as Boko Haram (International Crisis Group, 2021). Coastal flooding and saltwater intrusion threaten Nigeria's megacities, particularly Lagos, with significant implications for housing, transport, and industrial infrastructure. These dynamics erode state legitimacy, weaken governance, and exacerbate insecurity, while also undermining Nigeria's ability to exercise effective regional leadership in West Africa.

The chapter conceptualizes climate change in Nigeria as an existential crisis situated at the nexus of environment, economy, and politics. It interrogates the multiple ways climate risks intersect with development trajectories, livelihoods, governance challenges, and security threats. The discussion is organized into 14 substantive sections. Section two provides an overview of climate change in Nigeria, including historical trends and projections. Section three explores the economic dimensions, highlighting the implications for agriculture, industry, infrastructure, and fiscal policy. Section four examines the effects on political stability, including governance strains and the dynamics of conflict. Section five situates climate change as a security threat, drawing on case studies from the Middle Belt, Lake Chad, and the Niger Delta. Section six considers governance challenges, particularly the institutional and policy weaknesses that constrain Nigeria's adaptation responses.

Section seven addresses justice and equity dimensions, emphasizing the disproportionate burdens borne by marginalized communities, women, and youth. Section eight situates Nigeria within global climate negotiations and examines tensions between its dependency on oil revenues and its vulnerability to climate shocks. Section nine presents detailed case studies of climate-driven crises across the federation. Section ten analyzes the economic costs and long-term projections of climate change, while section eleven investigates the broader political economy of climate vulnerability. Section twelve outlines policy pathways and strategies for building resilience, followed by a conclusion in section thirteen and a comprehensive reference list in section fourteen.

By combining empirical data, case studies, and theoretical insights, the chapter demonstrates that climate change is not a peripheral issue for Nigeria but a central crisis that cuts across all dimensions of governance and development. It argues that the country requires urgent and transformative responses, including the diversification of its economy, investment in climate-resilient agriculture and infrastructure, strengthened institutions, and a just energy transition aligned with global commitments. Ultimately, climate change represents a test of Nigeria's capacity to adapt, govern effectively, and secure sustainable development in the twenty first century.

1. CLIMATE CHANGE IN NIGERIA: AN OVERVIEW

Climate change in Nigeria poses significant environmental, social, and economic challenges, manifested through rising temperatures, erratic rainfall patterns, and frequent extreme weather events. These changes have intensified desertification in the north, flooding in the south, and declining agricultural productivity across the country. Addressing climate change in Nigeria requires coordinated policy action, sustainable land management, and increased public awareness to build national resilience.

Climate Profile of Nigeria

Nigeria, covering an area of approximately 923,768 square kilometers, is Africa's most populous nation and a country of immense ecological diversity. Its geography stretches from the humid Atlantic coast in the south through dense tropical rainforests, fertile Guinea and Sudan savannahs, and semi-arid

Sahelian plains before reaching the arid desert margins in the far north (Nigerian Meteorological Agency [NIMET], 2022). This ecological gradient creates a mosaic of climate zones, each with unique vulnerabilities to global climate change.

The country's climate is largely influenced by the seasonal movement of the Intertropical Convergence Zone (ITCZ), which determines rainfall distribution. The interaction between the moist southwesterly monsoon winds from the Atlantic Ocean and the dry northeasterly Harmattan winds from the Sahara Desert generates marked wet and dry seasons (Adefolalu et al., 2020). Annual rainfall varies dramatically across regions, exceeding 3,000 millimeters in the Niger Delta and coastal zones, averaging between 1,200 and 1,600 millimeters in the Middle Belt, and dropping below 500 millimeters in the semi-arid northeastern Sahel (NIMET, 2022).

Temperature regimes also reflect Nigeria's latitudinal spread. While coastal zones enjoy moderate tropical temperatures, the northern states experience hot and dry conditions, with average maximums often surpassing 40°C during the peak of the dry season. This variability in climatic conditions underscores Nigeria's heightened exposure to diverse climate-related stresses, ranging from flooding and sea level rise in the south to desertification and drought in the north.

Nigeria's ecosystems including mangroves, rainforests, savannahs, and semi-arid plains are critical to livelihoods and biodiversity. However, these ecosystems are increasingly fragile under climate stress, with consequences for agriculture, energy production, water availability, and health outcomes (Akinsanola & Zhou, 2019).

Evidence of Climate Change in Nigeria

Robust scientific evidence demonstrates that climate change is no longer a distant threat for Nigeria but a present and intensifying reality. According to the World Bank (2021), Nigeria has experienced an average warming of 1.6°C since 1901, outpacing global averages. Projections suggest a further increase of between 2.0°C and 2.9°C by mid-century under moderate emissions scenarios, with potentially catastrophic effects on agriculture, water resources, and health.

Rainfall variability has become one of the most visible indicators of climate disruption. The north is experiencing prolonged dry spells and recurrent droughts, reducing crop yields and exacerbating water scarcity. Conversely, the south faces shorter but more intense rainy seasons, which have led to devastating floods. The 2012 nationwide floods, for example, displaced more than seven million people and caused damages estimated at $16.9 billion, underscoring the scale of economic vulnerability (Nkwunonwo et al., 2020).

Sea level rise poses particularly acute risks to Nigeria's densely populated coastal cities such as Lagos, Port Harcourt, and Warri. The Intergovernmental Panel on Climate Change (IPCC, 2021) warns that a one-meter rise in sea level could displace more than two million people in the Niger Delta, submerge farmland, inundate critical oil infrastructure, and disrupt the livelihoods of fishing communities. Saltwater intrusion into freshwater systems further threatens agricultural productivity and potable water supplies.

Desertification is advancing at alarming rates in the northern states of Borno, Yobe, Sokoto, Katsina, and Jigawa, with over 351,000 hectares of arable land lost annually to desert encroachment (Federal Ministry of Environment, 2020). This loss diminishes agricultural productivity, reduces grazing land for pastoralists, and forces communities into cycles of poverty and migration.

Nigeria is also witnessing an increase in extreme weather events such as heatwaves and windstorms. These events have cascading impacts on human health, infrastructure, and productivity. For instance, heat stress has been linked to rising incidences of vector borne diseases like malaria and cholera outbreaks following floods (Ebele & Emodi, 2020). The combined effects of warming, rainfall variability, flooding, and land degradation underscore the urgent need for national adaptation and mitigation efforts.

Regional Variations

The impacts of climate change in Nigeria are unevenly distributed across regions, reflecting ecological, socioeconomic, and political differences.

In the **Northern regions**, desertification, recurrent droughts, and heatwaves are eroding the foundations of agriculture and pastoralism. Livestock losses due to reduced grazing land and water scarcity are widespread.

The Lake Chad Basin, once a vital freshwater resource, has shrunk by over 90 percent since the 1960s, displacing fishing communities and fueling insurgency and cross border conflicts (International Crisis Group, 2021). These climate stresses have created migration pressures, pushing vulnerable populations southward in search of arable land and livelihoods.

The **Middle Belt**, Nigeria's agricultural heartland, is increasingly the epicenter of farmer herder violence. Climate induced migration of pastoralists from the north into farming communities intensifies land competition, triggering violent clashes. These conflicts have claimed thousands of lives and displaced millions, illustrating the interplay between environmental change and governance fragility (Okoli & Atelhe, 2021).

In the **Southern regions**, especially the Niger Delta and coastal areas, flooding, coastal erosion, and sea level rise are the dominant threats. Lagos, a megacity of over 20 million people, is considered one of the most climate vulnerable cities in the world. Seasonal flooding regularly displaces thousands of residents, disrupts transport networks, and damages homes and businesses (Adelekan, 2021). Coastal erosion also threatens oil infrastructure, jeopardizing the economic base of the country.

These regional variations highlight the multi-scalar nature of climate change in Nigeria. While northern states battle advancing desert sands, southern communities confront rising seas and recurrent floods. Urban centers face infrastructural collapse, while rural communities experience food insecurity and resource scarcity. Addressing this crisis requires locally tailored adaptation strategies embedded within a comprehensive national framework that integrates climate science, governance reforms, and community participation (UNDP, 2021).

2. ECONOMIC DIMENSIONS OF CLIMATE CHANGE IN NIGERIA

The economic impact of climate change in Nigeria is profound, affecting key sectors such as agriculture, fisheries, energy, and infrastructure. Reduced crop yields, damage to coastal assets, and increased health expenditures from climate related diseases strain national productivity and income.

Consequently, climate change threatens to exacerbate poverty and inequality unless adaptive economic policies and green investment strategies are effectively implemented.

Impacts on Agriculture and Food Systems

Agriculture remains central to Nigeria's economy, employing 36 percent of the labor force and contributing roughly one quarter of GDP (National Bureau of Statistics [NBS], 2023). The sector is extremely climate sensitive, relying heavily on rainfall for irrigation. Droughts, floods, and erratic rainfall undermine crop yields, reduce livestock productivity, and exacerbate food insecurity.

The 2012 floods provide a stark example: over 500,000 hectares of farmland were destroyed, displacing millions and causing losses estimated at USD 16.9 billion (National Emergency Management Agency [NEMA], 2013). Projections suggest that climate change could reduce yields of maize, rice, and sorghum by 10–25 percent by 2050 (Food and Agriculture Organization [FAO], 2021). Fisheries are similarly threatened by rising temperatures and declining water levels in Lake Chad, undermining a vital source of protein and livelihoods for millions.

Food inflation reflects these pressures. Droughts in the north and floods in the south constrain grain supplies, contributing to food inflation of 24 percent in 2023 (NBS, 2023). With Nigeria's population projected to reach 400 million by 2050, climate induced agricultural decline poses severe risks to food security, rural poverty, and political stability.

Oil and Gas Economy under Climate Pressure

Nigeria's economy is heavily dependent on oil and gas, which account for over 70 percent of government revenue and 90 percent of foreign exchange earnings (Central Bank of Nigeria [CBN], 2022). Climate change threatens this sector through physical risks and global energy transitions.

Flooding and sea level rise in the Niger Delta increasingly disrupt oil infrastructure. In 2022, widespread floods halted production in parts of Bayelsa and Rivers states, reducing national output and exacerbating fiscal shortfalls (NEMA, 2022).

Beyond physical risks, the global transition toward renewable energy poses existential threats to Nigeria's oil economy. As countries commit to net zero targets, demand for fossil fuels is projected to decline sharply by midcentury (International Energy Agency [IEA], 2021). For a country reliant on oil rents for fiscal stability, this represents a profound structural challenge.

Infrastructure Damage and Adaptation Costs

Climate change imposes mounting costs on Nigeria's infrastructure. Floods regularly damage roads, bridges, electricity installations, and housing. The World Bank (2022) estimates annual flood related damages at USD 1.5 billion. The Lagos floods of 2022 submerged major highways, halted transportation, and damaged thousands of homes, illustrating urban vulnerability.

Adaptation costs are projected to reach USD 100 billion by 2050 (Federal Ministry of Environment, 2021). These include investments in resilient infrastructure, early warning systems, flood defenses, and climate smart agriculture. With Nigeria already facing fiscal constraints and rising debt, financing adaptation presents major economic and governance challenges.

Trade, Markets, and Inflation

Climate shocks disrupt trade flows, destabilize markets, and fuel inflation. Erratic rainfall reduces agricultural surpluses available for domestic and regional markets, undermining Nigeria's role as a grain supplier in West Africa. Flood induced road closures impede the movement of goods, raising transport costs and market volatility. For a population already burdened by high poverty levels, climate induced price volatility threatens social stability.

Employment and Poverty Dynamics

Employment and poverty dynamics are deeply intertwined with climate change. Agriculture, fisheries, and forestry employ millions of Nigerians but are increasingly precarious. Reduced agricultural productivity forces rural youth to migrate to cities, where they often join the informal sector with limited prospects. Climate induced poverty could push an additional 20 million Nigerians into extreme poverty by 2050 (World Bank, 2021).

This not only undermines social welfare but also erodes the human capital necessary for national development.

3. CLIMATE CHANGE AND POLITICAL STABILITY

Climate change in Nigeria is not only an environmental or economic phenomenon but also a profound political challenge. As climatic stresses deepen, they destabilize fragile governance systems, heighten competition over resources, and exacerbate preexisting ethnic, religious, and regional divisions. The consequences are particularly evident in farmer herder conflicts, insurgency in the Lake Chad Basin, and the overall strain on governance institutions.

Farmer Herder Conflicts

Farmer herder conflicts epitomize how climate change magnifies political instability. For centuries, pastoralists from the arid north migrated seasonally to graze cattle on more fertile southern lands. This relationship was historically managed through customary institutions and reciprocal arrangements. However, desertification and declining pastureland in the north, driven by rising temperatures and reduced rainfall, are forcing herders to migrate southward permanently. As they settle in farming communities, competition for land, water, and fodder becomes increasingly violent (Okoli & Atelhe, 2020).

The Middle Belt states of Benue, Plateau, and Taraba have become epicenters of these clashes, often referred to as Nigeria's "new frontline of insecurity." According to the International Crisis Group (2021), these conflicts now claim more lives annually than the Boko Haram insurgency. Crops are destroyed by grazing cattle, water sources are polluted, and retaliatory attacks between communities escalate into cycles of violence. Climate change is not the sole driver; ethnic tensions, religious differences, small arms proliferation, and weak state presence all interact with environmental stressors. Yet the intensification of conflict is closely tied to the shrinking ecological space available for both pastoralists and farmers.

The violence has profound political implications. It polarizes communities along ethno religious lines, weakens intercommunal trust, and fuels perceptions of state bias, particularly when security forces are accused of favoritism. In some states, militias have emerged to defend local farming populations, while herder groups organize for protection, further militarizing the conflict. The inability of the federal government to provide lasting solutions undermines public confidence and delegitimizes political institutions.

Climate Induced Insurgency in the Lake Chad Region

The Lake Chad Basin offers a stark example of how ecological collapse interacts with insecurity. Once one of Africa's largest freshwater bodies, Lake Chad has shrunk by more than 90 percent since the 1960s due to reduced rainfall, overuse, and rising temperatures (United Nations Development Programme [UNDP], 2021). Communities dependent on fishing, farming, and pastoralism have seen their livelihoods devastated. This ecological disaster created fertile ground for socioeconomic grievances, unemployment, and poverty.

Boko Haram, Nigeria's most notorious insurgent movement, capitalized on these grievances. The group exploited the desperation of young men who had lost access to livelihoods, offering them income, food, and a sense of identity. As UNDP (2021) notes, many recruits cited economic deprivation and lack of opportunity as key motivations for joining extremist groups. Climate change thus did not cause Boko Haram but acted as a powerful risk multiplier, eroding resilience and enabling extremist narratives to gain traction.

The insurgency has displaced more than three million people across Nigeria, Chad, Niger, and Cameroon, creating one of the world's most severe humanitarian crises (Internal Displacement Monitoring Centre, 2022). Climate related migration continues to fuel tensions in host communities, while military operations are hampered by challenging terrain and weather conditions. The Lake Chad case demonstrates how environmental degradation, when combined with weak governance and poverty, can destabilize entire regions and spill across national borders.

Governance Strain

The political system in Nigeria faces mounting strain as climate-induced conflicts, disasters, and migration outpace institutional capacity.

Federal and state governments are often reactive rather than proactive, responding only after crises erupt. Disaster management agencies are underfunded, understaffed, and poorly coordinated, leading to delayed and inadequate relief. The 2012 and 2018 nationwide floods revealed how emergency responses were slow and fragmented, leaving affected populations disillusioned (Ebele & Emodi, 2020).

Moreover, governance legitimacy is eroded by corruption and politicization. Funds earmarked for ecological management and climate adaptation are frequently misallocated, siphoned off, or distributed along political patronage networks (Transparency International, 2022). Communities experiencing repeated floods or desertification often accuse political elites of neglect, reinforcing narratives of marginalization and exclusion.

Climate induced pressures also complicate federalism in Nigeria. Resource disputes between states, demands for security autonomy, and calls for restructuring are intensified by the uneven distribution of climate impacts. For example, northern leaders emphasize desertification and poverty alleviation, while southern leaders prioritize coastal protection and oil infrastructure. This divergence complicates national consensus-building and hinders cohesive climate policy.

Ultimately, climate change strains not only Nigeria's capacity to manage environmental risks but also its very system of governance. By magnifying conflict, fueling insurgency, and exposing state weaknesses, climate change has become a central driver of political instability in the country.

4. CLIMATE CHANGE AS A SECURITY THREAT

The notion of security in Nigeria has historically been understood in military terms, centered on territorial integrity and protection from insurgency. However, climate change reframes security through the lens of environmental and human security. Environmental security emphasizes the protection of ecosystems and resources essential for human survival, while human security focuses on ensuring access to food, water, health, and shelter (Barnett, 2020).

In Nigeria, climate change undermines both, creating cascading threats that challenge the capacity of the state.

Climate induced food insecurity in the north has contributed to widespread malnutrition, with the United Nations Children's Fund (UNICEF, 2022) estimating that 17 million Nigerians face acute hunger in 2023. Rising temperatures and erratic rainfall increase water scarcity, particularly in northern states, heightening tensions over boreholes and rivers. Health risks such as malaria and cholera spread as climatic conditions shift, overwhelming fragile public health systems.

Climate change functions as a conflict multiplier rather than a direct cause of violence. Droughts and desertification push pastoralists southward, sparking clashes with farmers. Floods displace communities, leading to disputes over resettlement and relief distribution. Declining fish stocks in Lake Chad intensify competition among fishing communities, some of whom align with armed groups. These dynamics exacerbate preexisting ethnic, religious, and political divisions (Krampe, 2021). For instance, in 2020, violent clashes between Tiv farmers and Fulani herders in Benue and Nasarawa states left hundreds dead, with analysts attributing intensification of violence partly to climate induced migration pressures (International Crisis Group, 2021). This illustrates how climate change magnifies structural weaknesses in Nigeria's governance system, fueling a cycle of insecurity.

The Nigerian military increasingly confronts climate related security challenges. Floods regularly disrupt military logistics and operations, while desertification complicates surveillance in the northeast. The armed forces are deployed for disaster relief during major floods, stretching already limited resources. Furthermore, climate induced insurgencies like Boko Haram require both military and developmental responses, underscoring the need for security institutions to integrate climate resilience into planning (Ezeani, 2022).

Governance Challenges in Responding to Climate Change

Nigeria has developed several climate policies, including the National Climate Change Policy (2021) and the Climate Change Act (2021), which establishes a National Council on Climate Change.

These frameworks aim to coordinate mitigation and adaptation strategies, ensure low carbon development, and align Nigeria with its Nationally Determined Contributions (NDCs) under the Paris Agreement (Federal Government of Nigeria, 2021). However, institutional capacity remains weak. Implementation suffers from inadequate funding, poor interagency coordination, and corruption. State and local governments, responsible for much on-the-ground adaptation, often lack technical expertise. Moreover, climate policy is frequently overshadowed by immediate economic and security crises, limiting political prioritization (Akinbami et al., 2022).

Nigeria's federal system complicates climate governance. While the federal government formulates national policy, implementation depends on states with diverse priorities and capacities. For instance, Lagos has pioneered climate adaptation with flood early warning systems and drainage improvements, while many northern states lag behind in desertification control (Adelekan, 2021). This unevenness creates spatial inequalities in vulnerability and resilience.

Corruption undermines climate finance. Funds allocated for ecological restoration, renewable energy projects, or disaster relief are often mismanaged or diverted. Transparency International (2022) ranked Nigeria among the most corrupt countries, with significant leakage of environmental funds. This not only limits adaptation but erodes trust in government, reducing citizen willingness to engage in climate programs.

Climate Justice and Equity Issues

Climate change disproportionately affects Nigeria's poorest and most marginalized populations. Rural farmers and pastoralists, women, children, and internally displaced persons (IDPs) bear the brunt of impacts. Women, who constitute the majority of smallholder farmers, face barriers in accessing land, credit, and extension services, making adaptation difficult (Ozor & Umunakwe, 2020). Children suffer health risks from malnutrition, water scarcity, and disease outbreaks.

Regional disparities in climate impacts mirror Nigeria's socioeconomic divides.

Northern states face desertification and drought, southern states face flooding and sea level rise, while the Middle Belt is plagued by farmer herder conflicts. These inequalities risk fueling regional grievances, with some northern elites framing desertification as evidence of federal neglect (Mustapha, 2021).

Climate change also raises intergenerational justice concerns. Current reliance on oil rents and inadequate investment in renewable energy saddle future generations with ecological degradation, stranded assets, and debt. Young Nigerians, who already face high unemployment, may inherit a diminished economy and degraded environment unless decisive action is taken (UNDP, 2021).

5. NIGERIA IN GLOBAL CLIMATE POLITICS

Nigeria is a signatory to the Paris Agreement and submitted updated NDCs in 2021, pledging a 20 percent unconditional reduction in greenhouse gas emissions by 2030, and up to 47 percent conditional on international support (Federal Government of Nigeria, 2021). The country also committed to achieving net zero emissions by 2060. These targets, however, are complicated by continued reliance on oil revenues.

Nigeria's position in global climate diplomacy is marked by contradictions. On the one hand, it seeks climate finance and technology transfer as a vulnerable developing country. On the other, it resists rapid fossil fuel divestment, arguing for a just transition that accommodates development needs. Nigerian officials have emphasized that the country cannot abruptly abandon oil, which underpins fiscal stability (IEA, 2022). Nigeria also plays a leadership role in regional climate initiatives, including the Great Green Wall program to combat desertification across the Sahel. However, limited funding and weak implementation constrain impact. As the largest economy in West Africa, Nigeria's ability to demonstrate effective climate action is crucial for regional stability (African Union Commission, 2022).

The Shrinking of Lake Chad; once Africa's largest inland water body, has shrunk by 90 percent since the 1960s, devastating livelihoods for over 30 million people across Nigeria, Niger, Chad, and Cameroon.

In Nigeria, communities in Borno and Yobe states face collapsing fisheries, reduced farmland, and forced migration. This ecological disaster has fueled recruitment into Boko Haram and contributed to regional instability (Onuoha, 2020). *The 2012 and 2022 Floods;* the floods of 2012 and 2022 highlight Nigeria's vulnerability to extreme weather.

In 2012, 363 people were killed and over 2 million displaced, with damages estimated at USD 16.9 billion (NEMA, 2013). In 2022, flooding across 33 states displaced 1.4 million people, killed 612, and destroyed 110,000 hectares of farmland (NEMA, 2022). These disasters reveal weaknesses in urban planning, drainage infrastructure, and early warning systems. Farmer *Herder Violence in the Middle Belt*; the Middle Belt states have witnessed escalating violence between farmers and herders, exacerbated by desertification, population growth, and weak governance. In Benue State, over 1,600 people were killed in 2018 alone (International Crisis Group, 2021). Climate change intensifies this crisis by accelerating resource scarcity, migration, and land competition.

Economic Costs and Projections

Climate change is projected to reduce Nigeria's GDP by 6–30 percent by 2050 under high emissions scenarios, equivalent to losses of USD 100–460 billion (World Bank, 2021). Agriculture, fisheries, and forestry will bear the greatest losses, while floods and heatwaves will damage urban infrastructure.

By 2050, climate change could reduce agricultural employment by 20 percent, displacing millions of rural workers (FAO, 2021). Migration to cities will strain urban infrastructure, housing, and labor markets. Without adaptation, poverty levels could rise sharply, reversing decades of progress.

Climate induced health burdens will also impose economic costs. Rising malaria incidence, heat related illnesses, and waterborne diseases could reduce labor productivity and increase healthcare expenditures. The World Health Organization (WHO, 2021) projects that climate change will increase health related costs in Nigeria by USD 5 billion annually by 2030.

Political Economy of Climate Change in Nigeria

Nigeria's oil dependency shapes its political economy. Rentier politics, characterized by the distribution of oil rents to elites and patronage networks, limits incentives for economic diversification. Climate change and the global energy transition threaten this rentier model, creating risks of fiscal collapse and political instability (Okonjo-Iweala, 2021). Corruption undermines climate action.

Funds allocated for ecological projects, such as the Great Green Wall or flood control, are often misappropriated. This weakens public trust and perpetuates vulnerability. Climate change thus intersects with governance failures, producing a vicious cycle of underdevelopment and insecurity (Transparency International, 2022). Nigeria receives climate finance from international donors, but this raises sovereignty concerns. Some elites perceive conditionalities as external interference, while others use aid flows to reinforce patronage. These dynamics complicate efforts to ensure effective and equitable climate governance (Akinbami et al., 2022).

Policy Pathways for Addressing Climate Change

Adaptation Strategies; adaptation must be prioritized to protect livelihoods and reduce vulnerability. Climate smart agriculture, drought resistant crops, irrigation systems, and flood defenses are crucial. Early warning systems, reforestation, and urban drainage improvements can mitigate disaster risks. *Mitigation Strategies;* nigeria must also pursue mitigation, particularly through renewable energy. Expanding solar, wind, and hydropower could reduce emissions and create jobs. The government has initiated the Solar Power Naija program, aiming to provide electricity to 25 million Nigerians through decentralized solar systems (Federal Government of Nigeria, 2021).

Governance Reforms; institutional reforms are necessary to strengthen climate governance. These include enhancing coordination between federal and state governments, increasing transparency in climate finance, and mainstreaming climate considerations across sectors. Anti-corruption measures are essential for ensuring funds reach vulnerable populations.

Just Energy Transition; a just transition from oil to renewable energy is critical.

This requires diversifying the economy, retraining oil sector workers, and investing in green industries. Without a managed transition, the decline of oil rents could destabilize Nigeria's economy and politics.

CONCLUSION

Climate change represents one of the serious challenges to Nigeria's economic, political, and social stability. The evidence presented throughout this chapter underscores that the country's vulnerability stems not only from its geographical exposure to desertification, flooding, and rising temperatures but also from its deep structural dependence on climate sensitive sectors and fossil fuel revenues. Agriculture, fisheries, and energy, the pillars of Nigeria's economy, are already experiencing disruptions that threaten livelihoods, food security, and fiscal sustainability. Climate driven declines in productivity, coupled with mounting adaptation costs and global energy transitions, signal an urgent need for transformative economic diversification and investment in resilience.

The consequences of climate change extend beyond economic loss; they reshape the political and social landscape of Nigeria. As the environment deteriorates, competition over scarce resources intensifies, fueling farmer herder conflicts, deepening poverty, and magnifying insecurity in the Lake Chad Basin and other regions. Weak institutional capacity, governance inefficiencies, and corruption further undermine the state's ability to respond effectively to these interlocking crises. Without decisive reforms, climate change could exacerbate inequality, accelerate migration, and erode public trust in government institutions, threatening the very foundations of national stability.

Moving forward, Nigeria's response must be anchored in integrated strategies that align environmental sustainability with economic transformation. This entails mainstreaming climate adaptation into national development planning, strengthening institutions at federal and state levels, and ensuring transparency in climate finance. A just energy transition, one that balances global decarbonization goals with domestic development needs, is imperative.

Investments in renewable energy, climate smart agriculture, and resilient infrastructure will not only mitigate future losses but also open pathways for green employment and innovation. Ultimately, addressing climate change is not a peripheral task but a central pillar of Nigeria's quest for sustainable development, peace, and prosperity in the 21st century.

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CHAPTER 3
TECHNOLOGY, INEQUALITY AND DIGITAL ECONOMY IN CRISIS CONTEXTS: POLICY CHALENGES AND OPPORTUNITIES

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INTRODUCTION

The historical periods of crisis have always increased the rate of technological change and changed the formations of the political economy. The COVID-19 pandemic, worldwide economic upheavals and climate-related crises have highlighted the critical role of digital infrastructures to economic resilience, service provision and social endurance. During periods of systemic stress, societies tend to move quickly on to digital substitutes: payments go online, supply chains are rearranged via platforms, and knowledge work gets redistributed over virtual space. These changes are however not neutral. They reproduce and in most instances intensify ancient inequalities in income, geography, gender and institutional capacity. As an example, although lockdowns due to the pandemic boosted the rise in digital commerce and remote work, it also increased the gap between those who already have access to a stable internet connection, affordable device availability, and digital literacy to engage in it. Equally, financial crises have driven the use of cryptocurrency and mobile banking in certain areas, where they are typically not properly regulated, leaving vulnerable groups vulnerable to fluctuations and fraud. The digital transformation of the global political economy presents one of the concentrated power of digital infrastructures, platform ecosystems, and rules of data governance with a few corporations and states. Such centralization poses a danger of developing techno-dependency, especially on the part of the Global South, which may often lack sovereign infrastructures, enforceable regulatory frameworks and bargaining power in the world digital markets. This chapter reviews the dialectical co-relationship between technology, inequality, and the crisis of digital economy. It proceeds in three moves. It places digital crisis responses in contexts of larger theories of political economy, inequality, and technological change, first. Second, it examines the trends of crisis-led digital transformations platform, finance, and labour. Third, it investigates the policy dilemmas that arise in regulating digital economies in the context of uncertainty and asymmetry and then moves to specific case examples. The concluding part gives suggestions on the inclusive, accountable, and resilient digital governance during crisis times.

1. THEORETICAL FRAMING: POLITICAL ECONOMY OF TECHNOLOGY AND INEQUALITY

The perspective of international political economy, (IPE), sees crisis not as a disruption of economic activity; it is a point of revelation and reflexivity of structural relations of power, production, and distribution. Technology has two functions in this framing: as an economic facilitator of continuity and adjustment, and as a governance tool that reallocates power among states, corporations, and citizens. The digital economy especially in the crisis conditions is an expression of three overlapping dynamics. First, it discloses the asymmetries of structure access and capacity. As an example, advanced economies deploy sovereign cloud infrastructures, AI-based analytics, and powerful digital welfare systems, on the other hand, many states in the Global South rely on external platforms to deliver basic services. This dependency strengthens the trends of digital colonialism, where infrastructures, data and skills are owned and governed externally. Second, the concentration of platform power is present in technological changes in crises. The infrastructures of exchange are dominated by large technology companies including international e-commerce giants and intermediaries of fintech. They do not just find themselves in value chains but even politically: by possessing digital payments, communications infrastructures, or logistics systems, they are able to influence how countries react to emergencies. In this meaning, platform power is market dominance as well as infrastructural governance (Srnicek, 2017; Luitse, 2024). Third, the dual logic of inequality in digital economies are heightened by crises. On the one hand, there is the prospect of decreasing exclusion with the help of digital public goods (e.g., mobile money in the hands of the unbanked, telemedicine in the case of health emergencies). On the other is the exaggeration of divides in which access is not uniform, where digital labor is precarious, and algorithmic governance disproportionately imposes on marginalized people. Technology, so to speak, does not eradicate inequality, it reallocates it to other forms, frequently by strengthening the existing orders of gender, race, classes, and locations (Couldry and Mejias, 2019). The IPE theory is useful in putting these dynamics into larger contexts of sovereignty, dependency and structural inequality.

States are trying to maintain digital sovereignty through control of the platforms, developing infrastructure and striking data governance regimes. However, the asymmetries of the crisis manifest in these ways: the European Union is progressing in the direction of a holistic framework, including the Digital Services Act and AI Act, but numerous states lack the institutional capacity to raise regulation of digital markets, which makes them susceptible to techno-dependency (Rizwan Arda, 2024). It is also important that there is the distribution of infrastructural power. Over 70 percent of the world data centers and cloud facilities are located in North America, Europe, and some regions in East Asia (AInvest News, 2025). Such physical geographic consolidation implies that much of the crisis-time resilience of the Global South is reliant on infrastructures that are physically situated in other locations. Dependency can, therefore, be not only technical: it restricts the freedom of states to protect information, control the digital economies, or solve their own recovery plans. Last, there is also discursive power, which is the stories that make digital economies in times of crisis. Technology is often depicted as something transformative and inclusive, and the structural inequalities of its use are hidden. Digital resilience or innovation-led recovery discussions tend to praise rapid digital adoption and underestimate exclusion, surveillance threats, and precarity of labour. Theoretical framing therefore involves critical interest in legitimization of crises to make swift adoption of technology without adequate protection. In a nutshell, the political economy of technological inequality is worsened during times of crisis. They quicken the pace of digital adoption and solidify asymmetries of access, infrastructure and governance. The use of technology during crises is, not just, a technology of neutral adaptation but a terrain of power, dependence and redistribution

2. METHODS AND SOURCES

This chapter used a wide and interdisciplinary corpus of materials which capture the ways in which digital technologies, economic infrastructures and governance frameworks have worked in the course of the recent crisis periods. The materials include three major strands:

Firstly, scholarly literature and systematic reviews. Scholarly work in the international political economy, development studies and digital governance can offer a conceptual basis to understand the relationship between technology and inequality during crisis. The value of the opportunities and the structural risk of crisis-driven digitalization is emphasized in recent discussions of digital inclusion (James, 2023), fintech adoption (Ozili, 2022), as well as platform labor (De Stefano and Wouters, 2023). The uneven digital participation by the basis of income, gender, and geography is empirically evidenced by comparison studies of digital divides during the COVID-19 pandemic (Van Dijk, 2021; Robinson et al., 2022).

Secondly, institutional and policy documents. The empirical basis is made up of reports provided by the World Bank, the International Monetary Fund, the OECD and UN agencies. According to the World Bank, the World Development Report 2021: Data for Better Lives gives evidence on the role of data infrastructures in resilience and inequality. The IMF crisis briefs (20222024) are tracking the macroeconomic impacts of fintech use and digital currency in weak economies. Equally, the African Union and the UN Economic Commission in Africa (UNECA) have also created toolkits on digital governance and regional approaches to developing digital sovereignty during the post-pandemic recovery (UNECA, 2023).

Thirdly, grey literature and industry data. NGO recommendations, corporate white papers, and practitioner reports provide information on platform concentration, the adoption of digital finance, and labour dynamics. As an example, the Mobile Economy Reports prepared by GSMA give some figures on the mobile money uptake in Africa and Asia. The findings described by McKinsey in Digital Adoption in Crisis Recovery (2021) and the World Economic Forum in Future of Jobs Report (2023) are consultancy outputs that illustrate the views of the private sector regarding crisis-time digital acceleration. Civil society (e.g. Alliance for Affordable Internet, Access Now) practitioner sites articulate civil society issues of digital rights, surveillance and inequality in times of crisis governance.

This is a synthetic approach and not statistical. The chapter is built by synthesising academic commentaries, institutional accounts and practitioner insights to create a cohesive view that encompasses conceptual debates with empirical evidence. It is not restricted to the economic indicators (e.g., the impact of digital sectors on GDP) but also governance, labour and rights aspects of digital transformation enable crisis settings. Insofar as possible, the discussion is based on comparative case evidence. The examples of the development of the digital economies under pressure are given by the COVID-19 pandemic, financial crises in the emerging economies, and crises caused by climate. The following cases are not formative but illustrate how technological acceleration, disparity, and dilemmas tend to reappear in terms of governance. Along with the structure of critical IPE research, the chapter also highlights the political-economic asymmetries inherent in digital infrastructures: who owns them, who controls them, who gains, and who is excluded. Such a methodological position guarantees that technology is examined not as a tool and it is rather the built-in framework in the relationship of inequality in the world.

3. CRISIS-DRIVEN DIGITAL TRANSFORMATIONS

Crises frequently act as accelerators of technological change. When traditional infrastructures are disrupted, digital substitutes often expand at unprecedented speed. The COVID-19 pandemic, global financial disruptions, and climate-related emergencies illustrate how digital platforms, financial technologies, and remote work infrastructures have been adopted as crisis-response mechanisms (O'Toole et al., 2020). These crises not only prompted rapid digitalization across sectors but also reshaped organizational behaviour, consumer habits, and labor practices worldwide (Avalos et al., 2023). However, these transformations reveal not only innovation and resilience but also persistent inequalities, including uneven digital access, increased market concentration among tech giants, and growing insecurity in platform-based employment (International Labour Organization [ILO], 2022). Such dynamics highlight the dual nature of technological acceleration, driving progress while deepening socio-economic divides that demand critical policy responses.

Technological change is often catalysed by crises. Digital alternatives tend to grow at a rate unparalleled when the conventional infrastructures are affected.

The COVID-19 pandemic, worldwide financial imbalances, and climate emergencies are examples of how digital platforms, financial technologies, and remote working infrastructures have been flexed into use as crisis-response mechanisms. However, these changes bring to light not only innovation and resilience but also disparate access, concentration in the market, and insecurity of labour.

Digital Acceleration within the Industry

Among the most visible changes in crisis situations is the fast spread of online platforms. Applications of e-commerce, telemedicine, online education, and delivery increased exponentially under lockdowns during the pandemic. Consumer behaviour shifted to online marketplaces in the majority of the countries, and shopping platforms, including Amazon, Alibaba, and Jumia, increased their influence (UNCTAD, 2021). On the same note, remote consultations were supported by digital health platforms and learning management systems maintained the continuity of education. There are two effects, structural of this expansion. To begin with, platforms have now emerged as an indispensable infrastructure to national economies that no longer reside on the outer boundaries of economic survival but form the core of it. Second, the global platform corporations have been increasing in dominance. Small digital innovators and local business found it challenging to stay up to date with the scale, logistics, and data advantages of multinational actors. The result of this consolidation strengthened the dependency on platforms, where national economies were dependent on external digital infrastructure to provide the necessary services (Srnicek, 2017). Platform vulnerabilities were also brought to the fore courtesy of crisis. Inaccurate information on social media sites complicated the way people responded to the pandemic, and algorithmic delivery frameworks focused on profitability rather than fairness in the distribution of services. The ambiguous nature of platforms as sources of resilience and sources of novel risks became a halo characteristic of digitalization during crisis periods.

GAPS Digital Financial Inclusion

The historical parallels of the financial crisis and health crises have triggered the implementation of digital financial technologies. Sub-Saharan Africa Mobile money systems, such as, proved to be lifelines in the household due to the COVID-19, as they managed to transfer and receive remittances without physical contact to access banks where physical banking was not available (GSMA, 2022). On the same note, cryptocurrencies were adopted more in areas where there was inflation like Argentina, Nigeria and Turkey; people needed an alternative to the depreciating currencies (Chainalysis, 2023). But inclusion gaps were also created by digital finance. Mobile banking access was still gender, income, and geographically stratified. Identification, literacy, or possession of the device were not consistent across women, rural populace, and informal workers, thus disadvantaging them (Suri and Jack, 2016). Cryptocurrencies added volatility and fraud exposure especially in regulatory black holes. CBDCs ran in China, Nigeria, and the Bahamas, demonstrated the potential of state-style financial resilience and dangers of monitoring and coercive financial control (Auer et al., 2022). Such dynamics highlight the contradiction of digital finance in crisis situations: on the one hand, it increases access to financial instruments; on the other hand, it strengthens the structural imbalance and creates a new problem of regulation.

Remote Work, Automation and Labour Inequalities

The most significant crisis-related change in the labour-market, perhaps, has been the remote-work diffusion and automation. The COVID-19 crisis pushed millions of workers to work at home and perform digital work, facilitated by videoconferencing, collaborative tools and cloud-based solutions. Among high-skilled workers in the finance, IT and professional services industry, the transition saved the wages and hastened the digitalization. The advantages of remote work were, however, unevenly spread. The poor and informal workers who were clustered in the retail, agricultural and manufacturing industries had no choice to digitalize their labor. They instead suffered disproportional loss of jobs, precarity, and lockout (ILO, 2021). A new source of income through the emergence of gig platforms like Uber, Deliveroo and Upwork, put insecure, algorithmically mediated labour in place, as well.

There was also important progress in the field of automation in times of crisis, with companies experiencing shortages of labor supply or losing supply due to crisis, investing in robotics and AI-driven operations. Although it enhanced the resilience of firms, it increased the concern of displacing jobs, mismatch of skills and polarizing between the digital and non-digital workforce (Brynjulfsson and McAfee, 2014). The work aspect of crisis-based digital transformation is thus exposed as a twofold path: increased flexibility and possibility to the digitally connected, increased precarity to those left out or made subordinate to platform and automated work regimes.

4. INEQUALITY IN THE DIGITAL ECONOMY

The digital changes that were released in the times of crisis are unevenly distributed. On the contrary, they reveal and, in many instances, increase structural inequalities between and within societies. The three major axes on which inequality occurs are access to infrastructure, platform controls, and data governance.

Access, Affordability, and Infrastructure Divides

Access to digital infrastructures is the most obvious face of inequality. Penetration of internet, high internet speed and affordability of the devices differ drastically with the regions. Although more than 90 percent of households in high-income nations have access to reliable connectivity, a third of households in Sub-Saharan Africa have consistent access to broadband (ITU, 2023). Urban/rural differences also exist even in countries where people in the rural areas pay a greater price to receive lower quality of connection. Disparities are magnified by crisis. The lack of connection also left households that lacked connectivity off of remote education, telemedicine, and digital labour markets during the COVID-19 pandemic. Children in low-income families lost a lot in learning, and workers who could not switch to digital versions of labour found themselves unemployed. The digital divide was therefore translated into recreation of socioeconomic disparities. Owning of devices also acts as a hindrance. Smartphones, laptops, and safe ways of payment are still out of the pocket of most households especially women and marginalized groups.

Affordability gaps imply that, in crisis-related contexts, digital economies tend to further consolidate prior privilege: those already integrated into formal economies enjoy it, while marginalized groups experience an even greater marginalization.

Market Concentration and Power of the Platform

On top of access, inequality of the digital economy is a result of platform power concentration. The e-commerce, cloud, and digital payment infrastructures in the world are dominated by a few corporations Amazon, Microsoft, Google, Alibaba, and Tencent. Their power position is reinforced at the time of crisis when demand of digital services skyrockets, and small competitors cannot adapt to it. This level creates dependencies of some kinds. The operation of the platforms is externally regulated, which makes national governments, small businesses, and consumers depend on them. As an example, the use of cloud assets that are owned by foreign companies negatively impacts the control of digital sovereignty, and the reliance on international logistics networks influences the formation of local supply chains. Concentration in the market also helps to extract rents, with the platforms gaining an opportunity due to the network effect and monopoly of data to extend its dominance (Srnicek, 2017). The imbalance is not tied to economics alone, but to politics as well. Platforms affect both crisis communication and public health messaging, as well as financial flows. The nature of information that is circulated, the businesses that flourish and the workers that are paired with opportunities are all the results of their algorithmic governance structures. This power of infrastructure reinforces inequalities of those in charge of platforms and those who are processed (Couldry and Mejias, 2019).

Digital Rights and Data Governance

Another data inequality axis is its governance. The crises leave enormous amounts of digital data behind them, such as health records and financial transactions, mobility data, and online communications. Although such data are useful in crisis management (e.g., by monitoring the spread of diseases, tracking financial flows), ownership and use is disproportionately distributed.

Advanced analytic capabilities are used to extract, store and monetize crisis information by corporations and states without a lot of informed consent or equitable benefits sharing. The vulnerable group, including migrants, non-formal workers, and households with low income, are the sources of data but with no control over how their data is used. In other settings, the emergency data collection allowed surveillance and repression, where crisis reasons prevail over privacy considerations (Access Now, 2021). A lack of strong data governance mechanisms, especially in the Global South, increases the reliance of these countries on outside agents to provide crisis analytics. International agencies and commercial entities offer platforms where monitoring and response can be established but in the process, they monopolize control of information related to crisis. This asymmetry establishes a different version of data colonialism (Couldry and Mejias, 2019), in which extracted data on the vulnerable groups enriches the systems of other actors instead of empowering the local population.

5. POLICY CHALLENGES IN CRISIS CONTEXTS

The growth of digital economies during a crisis opens up deep governance challenges. Technology improves resilience and innovation, but at the same time, it reveals regulatory asymmetries, undermining workers and other vulnerable groups, and creates privacy and security threats. Three policy issues can be singled out as being acute.

Techno-Dependency and Regulatory Asymmetries

Crises exert magnified inequalities in regulatory capacity. In the case of advanced economies, like the European Union, regulatory frameworks have been established to regulate digital markets, including the Digital services act, digital markets act, and future AI act. Such tools create responsibility to platforms, encourage competition and safeguard consumers. In comparison, a lot of states in Global South do not have similar structures. Consequently, they have to be reliant on external platforms and infrastructures and have little control over local standards.

This form of techno-dependency compromises sovereignty since the role of national governments becomes to adapt to international rule which is established by international companies or external authorities (AInvest, 2025). Crisis responses are also subject to regulatory asymmetries. An example is how national capacities to force compliance would determine the ability to control misinformation in digital spaces during pandemics. In these areas where such capabilities are not strong, disinformation spreads and comes at the cost of neglecting or frustrating public confidence and emergency management. The asymmetrical topography of the digital regulation thereby perpetuates the inequality in resilience and governance globally.

Social Protection and Digital Worker Rights

Crisis increases the emergence of digital work, which reveals significant policy gaps in social protection. Gig workers, remote freelancers and platform based workers usually do not have access to labour rights, collective bargaining and social security. As platforms offer income opportunities in moments of disruption, they impose risks on workers, who incur the expenses of precarity, algorithmic governance, and lack of benefits (De Stefano, 2016). The policy reactions have been lagging behind. Coverage was also uneven and short-lived as some governments tried to extend social protection to gig workers during COVID-19 (ILO, 2021). Attempts to codify digital labour, in the form of minimum wage guarantees, health insurance, or portable benefit standards, are opposed by platforms whose business model is built around flexible labour. The outcome is the increase of a distinction between digitally integrated workers who still enjoy the protection and platform-dependent workers that are left out. Automation brings on another dimension. With AI and robotics increasing investments faster than the crises, displaced workers have no relevant skills and no relevant retraining mechanisms. Lifelong learning, digital reskilling and inclusive labour transition policies are underdeveloped, with inequalities, as a concern, in the long run.

Privacy, Security and Ethical Use of Digital Data

Such extraordinary data gathering and surveillance is frequently justified by crisis. Digital vaccine passports, contact-tracing apps and financial monitoring systems proliferated into the COVID-19 pandemic. Although these tools boosted crisis management, they also posed a risk of overreach, misuse of data and violation of rights.

This lack of explicit sunset provisions ensured that emergency surveillance systems were frequently able to survive beyond the crisis to which they were supposed to be relevant (Privacy International, 2022). Crisis technologies found their second use in repression (e.g. surveillance of dissent and the suppression of civic space) in authoritarian settings. Ultimately, a lack of trust in digital governance was feed by weak transparency and oversight, even in democratic states. Another factor that compounded the problem of cybersecurity was the magnitude of the crisis, whereby more people started depending on digital tools, making them vulnerable to attacks in terms of hacking, ransomware, and fraud. The scams and phishing attacks worsened the exploitation of the digital finance users due to the financial crises. These weaknesses justified the urgency of the changes that have to balance the usefulness of the digital data during the crisis situation and the rights, security, and accountability protection.

6. CASE EXAMPLES

The use of empirical examples aids in the contextualization of discussion related to technology, inequality, and the digital economy during the times of crisis. Although no single case is comprehensive, three contexts, including pandemics, financial crises, and emergencies related to climate change manifest the common patterns of the accelerated use of digital, disparate inclusion, and governance problems.

The COVID-19 Pandemic and Digital Acceleration and Exclusion

This focuses on how the pandemic has accelerated and shifted to digital, revealing inequality and marginalization in access to technology and digital devices.

The topic of the COVID-19 Pandemic and Digital Acceleration and Exclusion is how the pandemic has increased and transitioned to the digital realm, uncovering disparities and inequality in technological and digital devices. The digital economy had a watershed moment with COVID-19. Lockdowns and social isolation encouraged the use of e-commerce, distance work, telemedicine and distance learning.

The growth in mobile money payments in Africa rose by more than 20 percent in 2019-2021, and the global e-commerce sales have gone up by $900 billion (UNCTAD, 2021). But, the pandemic revealed the extent of the digital divide as well. Students in families where internet connectivity or other devices could not be counted on experienced a disproportionate loss in learning, which forms what the World Bank referred to as a generational education crisis (World Bank, 2022). The exclusion of informal workers who lacked access to digital platforms deprived them of incomes, and the gig workers were subjected to an increased level of precocity with no social protection. In states with weak state capacity, dependence on digital logistics platforms and global platforms to disseminate information on health and promote health highlighted techno-dependency. The pandemic therefore exposed the two-sided side effects of digital transformation: both sustainability to the socio-economically linked, and marginalization to the digitally marginalized.

Financial Crises Cryptocurrency and Volatility

The experimentation with digital finance is usually triggered by a financial crisis. In Argentina, the inflationary environment compelled the citizens to seek safe currencies like the USDT as an insurance against currency losses (Chainalysis, 2023). Equally, in Nigeria, the limitations of foreign exchange markets promoted the use of cryptocurrencies and peer-to-peer websites were the important means of remittances and trade. Although these innovations gave households short-term financial strength, it also came with a clear exposure to financial uncertainty and fraud. On the stock markets, cryptocurrencies had their dramatic price movements, which weakened the savings of households. Incorporated into weak regulation spheres, the scam thrived and unsuspecting users were left with the expenses.

CBDCs are a parallel path can be observed in Nigeria's efforts toward digital finance innovation. The introduction of the eNaira in 2021 represented a significant step by the Central Bank of Nigeria to enhance financial inclusion, reduce transaction costs, and decrease reliance on volatile cryptocurrencies (Central Bank of Nigeria [CBN], 2021). However, despite initial optimism, adoption has remained limited due to low public trust, inadequate digital infrastructure, and fears of government surveillance (Auer et al., 2022).

The eNaira experience underscores how crises and technological shifts stimulate digital financial experimentation but also expose deeper governance challenges, socio-economic inequalities, and the persistent digital divide (IMF, 2023).

Climate Crises: Digital Agriculture and Uneven Access

The crisis that occurred as a result of climate has improved the pace of digital technology adoption in the agricultural sector, disaster management, and resource management. Weather shocks, planting optimization, and market access are predicted using predictive analytics, mobile apps, and satellite-based platforms to help farmers predict future weather shocks ahead of time. Digital agriculture platforms, such as Digifarm, in Kenya made inputs, credit, and training accessible to the smallholder during droughts. Access was however very uneven. The farmers who lacked access to smartphones, lacked digital literacy, or consistent internet connectivity were left out, which only contributed to disparities in rural populations (FAO, 2022). The other issue was that of data ownership: farmer data generated by platforms was frequently transferred to multinational corporations as opposed to local cooperatives, restricting community ownership. In disaster response, digital early-warning systems was more effective in increasing preparedness, but infrastructures were lacking in most vulnerable areas. Therefore, on the one hand, digital tools increase resilience in the face of climate crises, on the other hand, they reproduce disparities in access, ownership, and share of benefits.

7. POLICY RECOMMENDATIONS

The multi-pronged governance approach is necessary to address the inequalities of digital economies at the times of crisis. Policies should be able to support the adoption of technology not only but also guarantee equity, accountability, and resilience. There are five priority areas that are prominent:

Inclusive Digital Public Goods and Access

Universal digital access should be a public good that governments and international organizations should focus on. Connectivity gaps can be bridged with investments in low-cost broadband, community-based infrastructures, and subsidy of devices. Universal service funds need to be redesigned in order to respond to crisis-related needs, including emergency service in schools, hospitals, and small businesses. Such partnerships between the government and the business world can increase infrastructure, though with precautions taken to avoid monopolization.

Sovereignty and Regulatory Capacity

The creation of national regulatory capacity is a key to decreasing techno-dependency. This involves the passing of data protection legislation, platforms competitive policies, and crisis-time architecture of digital governance structures. The regional efforts, including African Unions Digital Transformation Strategy, should be reinforced to share the resources of regulation and negotiate with the international platforms. There is need to multilaterally work together to make sure that crisis technologies are in line with international human rights and development norms.

Digital Labour Social Protection

Policies will have to adjust to the realities of the platform-based and remote work. Gig and digital workers should have portable benefits systems, minimum wages, and the right to collectively bargain. The governments are also encouraged to invest in reskilling programs in order to equip workers with transitions caused by automation. The informal workers and platform-based workers must be specifically included in the list of emergency social protection measures so that the crises would not add to the further entrapment of precocity.

Ethical Governance, Privacy, and Justice of Data

Data collection in the crisis must be regulated by the principles of justice, consent, and proportionality. Privacy-by-design requirements, transparency in sun-setting emergency surveillance and auditing of digital interventions are standards governments should embrace. The international standards are required to ensure that vulnerable groups will not fall prey to exploitative data usage, and the digital records formed due to crises are not used against them to conduct surveillance or gain commercial advantages.

Digital Governance Multilateral Standards of Crisis

Since digital infrastructures are cross-border, multilateral coordination is a necessity. An international system, parallel in scope to the Paris Agreement on climate, might impose minimum standards of digital rights, crisis-information use and responsibility to platforms. UN agencies, OECD and regional organs ought to liaise in the creation of interoperable standards, which would stop fragmentation of regulations and inclusive crisis governance.

All these five pillars together, inclusive access, regulatory sovereignty, labour protections, data justice, and multilateral standards, establish the core of an accountable and fair digital economy during times of crisis. They juggle the allure of technological innovation on one hand and the demand to ensure inequality is mitigated and rights are protected on the other.

CONCLUSION

The interaction between technology and the digital economy during periods of crisis presents a complex mix of opportunities and challenges for policymakers, businesses, and society at large. In times of disruption; whether economic, political, or environmental, technological systems become both tools of survival and agents of transformation. Crises often expose structural weaknesses within economies, such as fragile supply chains, unequal access to information, and gaps in institutional capacity. Yet, they also accelerate the adoption of digital tools and innovative technological responses as individuals, firms, and governments seek to maintain continuity and resilience.

From the rapid rise of e-commerce during the COVID-19 pandemic to the deployment of artificial intelligence (AI) for crisis prediction and resource allocation, digitalization has emerged as both a stabilizing and transformative force. At the same time, crises intensify existing inequalities, particularly along digital and socio-economic lines. Access to reliable internet, technological literacy, and digital infrastructure remains highly uneven across countries and demographic groups. This "digital divide" creates a dual-speed economy where some actors thrive through technological adaptation while others become further marginalized. For instance, businesses equipped with digital tools were better able to pivot to remote operations during global lockdowns, while informal workers, microenterprises, and rural populations faced exclusion from digital opportunities. Consequently, the promise of technology as a democratizing force is tempered by its potential to reinforce entrenched socio-economic hierarchies. This chapter has explored the profound transformations in economic participation, labour relations, and social equity that accompany technological change. Digital technologies, automation, and AI are reshaping the nature of work and the structure of industries. Automation has streamlined production and service delivery, yet it has also displaced certain forms of labour, raising new questions about job security and the future of human capital. Gig platforms and digital labour markets have enabled flexible employment models but often at the cost of job stability, fair wages, and workers' rights. These developments highlight the need for adaptive labour policies and social protection systems that evolve alongside technological innovation. Despite the inequalities that digital transformation can exacerbate, digitalization also provides crucial pathways of resilience. During crises, technology enables businesses to sustain operations through virtual workspaces, digital payments, and online customer engagement. Governments leverage data analytics and digital platforms to ensure the continuity of essential services such as healthcare, education, and social welfare. Likewise, communities increasingly use digital tools for collective organization, mutual aid, and civic participation. In this sense, technology acts not only as a mechanism for recovery but as an enabler of new forms of social and economic life that transcend traditional limitations of geography and infrastructure. For policymakers, the central challenge lies in balancing innovation with inclusion.

This requires investing in foundational digital infrastructure, such as broadband networks, data centres, and cybersecurity frameworks, while ensuring that marginalized populations are not excluded from the benefits of digital growth. Equally important is the promotion of inclusive digital education and lifelong learning programs that equip citizens with the skills necessary to participate meaningfully in the digital economy.

Regulatory frameworks must also evolve to guarantee fair competition, data protection, and consumer rights in increasingly digitized markets. The goal is to ensure that the digital economy operates on principles of justice, accessibility, and shared prosperity rather than deepening inequality.

Moreover, crises underscore the importance of adaptive governance; a model of policymaking capable of responding swiftly to technological shifts without sacrificing accountability or ethical standards. Governments, private sectors, and civil society actors must collaborate to design interventions that are context-sensitive and culturally appropriate. Public-private partnerships can foster innovation ecosystems that address local needs, while civil society can help ensure that the voices of vulnerable groups are heard in digital policymaking processes. Ultimately, the long-term vision must transcend short-term crisis management. Technology in crisis contexts should not merely offer temporary relief or economic stabilization but should contribute to building sustainable, inclusive, and equitable digital economies. This involves embedding ethical design principles into technological development, prioritizing environmental sustainability, and promoting equitable access to data and digital capital. In this way, crises, while disruptive, can serve as catalysts for more thoughtful, balanced, and human-centred digital transformation, guiding societies toward a future where innovation and inclusion coexist as mutual imperatives.

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CHAPTER 4
CLIMATE CHANGE AS A DUAL POLITICAL AND ECONOMIC CRISIS: IMPLICATIONS FOR SUSTAINABLE DEVELOPMENT IN EMERGING ECONOMIES

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INTRODUCTION

The 21st century is increasingly defined by a polycrisis, where distinct global shocks interact to create compounding and catastrophic outcomes. At the heart of this confluence lies climate change, an issue once relegated to the domains of environmental science but now recognized as a profound and pervasive force reshaping the global order. It is no longer sufficient to frame climate change as a purely ecological problem; it has metastasized into the principal threat multiplier of our time, acting as a dual political and economic crisis with devastating implications for human progress. This is particularly true for emerging economies, the very nations that stand on the precipice of development but face the greatest existential risks from a rapidly destabilizing planet. This chapter argues that climate change functions as a systemic crisis that simultaneously erodes state capacity and cripples economic systems, thereby creating a feedback loop that fundamentally threatens the viability of achieving the Sustainable Development Goals (SDGs) in the Global South.

Historically, the discourse on climate change was dominated by scientific projections and ecological impacts—rising sea levels, melting glaciers, and threats to biodiversity. While these remain critical, the socio-political and economic dimensions have become impossible to ignore. The Intergovernmental Panel on Climate Change (IPCC) has unequivocally shifted its focus to include "Climate-Resilient Development," a framework acknowledging that climatic hazards interact with societal vulnerability to create systemic risks (IPCC, 2022). Vulnerability is not a naturally occurring state; it is a product of political and economic structures, historical injustices, and developmental pathways. Emerging economies, from the Sahelian belt of Africa to the low-lying island nations of the Pacific and the agrarian heartlands of South Asia, find themselves at the epicentre of this crisis, not because of their emissions, but because of their structural dependencies on climate-sensitive sectors and their limited adaptive capacities (Mbow et al., 2019).

This chapter conceptualizes climate change as a dual crisis. As a political crisis, it acts as a "threat multiplier" that exacerbates existing state fragilities, fuels resource conflicts, triggers mass migration, and challenges the very legitimacy and sovereignty of governments (Busby, 2021).

It tests the fabric of the international system, creating new arenas for geopolitical competition over resources, technology, and responsibility. As an economic crisis, climate change functions as the greatest market failure in human history (Stern, 2007). It inflicts direct damages on critical infrastructure, decimates agricultural output, disrupts supply chains, creates massive fiscal burdens for governments, and strands trillions of dollars in carbon-intensive assets (Acevedo et al., 2020). This dual assault systematically dismantles the very foundations upon which sustainable development is built.

The pursuit of the SDGs—a universal call to action to end poverty, protect the planet, and ensure prosperity for all—is predicated on a stable political and economic environment. However, the escalating climate crisis creates a fundamentally unstable context, turning the linear path to development envisioned by the SDGs into a Sisyphean task. How can a nation achieve food security (SDG 2) when recurrent droughts and floods destroy harvests? How can it ensure healthy lives (SDG 3) when heatwaves and vector-borne diseases surge? How can it promote inclusive economic growth (SDG 8) when its coastal cities, the engines of its economy, are threatened by sea-level rise?

This chapter will dissect this complex nexus. It begins by deconstructing the mechanisms through which climate change manifests as a political and economic crisis, using evidence from a range of emerging economies. It then maps the direct implications of this dual crisis onto the sustainable development agenda, illustrating how climate impacts cascade across the SDGs. The analysis will delve into the political economy of climate response, exploring the immense challenges of adaptation and mitigation in contexts of limited fiscal space and institutional capacity. Finally, it will conclude by offering a forward-looking perspective on the integrated policy frameworks required to navigate this era of climatic disruption, arguing that a paradigm shift from incremental adjustment to systemic transformation is the only viable path forward for emerging economies.

1. THE POLITICAL CRISIS DIMENSION OF CLIMATE CHANGE

Climate change has moved from the periphery to the core of international security and political stability discourse. Its role as a "threat multiplier" is now widely accepted, meaning it does not typically create conflict on its own but rather exacerbates existing tensions, weaknesses, and grievances within and between states (Scheffran et al., 2012). For emerging economies, many of which are already grappling with fragile governance, ethnic tensions, and developmental challenges, climate change acts as a powerful destabilizing agent. Its political manifestations are multifaceted, ranging from internal resource conflicts and state fragility to large-scale migration and new geopolitical frictions.

1.1 State Fragility, Resource Scarcity, and Internal Conflict

The most direct pathway through which climate change fuels political crisis is by intensifying competition over dwindling natural resources, particularly water and arable land. As climate patterns become more erratic—leading to prolonged droughts in some regions and intense, unpredictable rainfall in others—the resource base that sustains livelihoods and economies comes under immense pressure. This is not a future projection; it is a current reality in many parts of the world.

The Lake Chad basin in West and Central Africa serves as a stark archetype of this dynamic. The lake, a vital source of water and livelihoods for over 30 million people across Nigeria, Niger, Chad, and Cameroon, has shrunk by over 90% since the 1960s due to a combination of climate variability and unsustainable water management (Okpara et al., 2016). This ecological catastrophe has had profound political consequences. It has decimated traditional livelihoods like farming, fishing, and pastoralism, creating a vast pool of unemployed and disaffected youth. This widespread economic desperation has been a key factor in the rise and persistence of violent extremist groups like Boko Haram, which have exploited the governance vacuum and offered alternative livelihoods to marginalized populations (Adelphi, 2019).

Here, climate change did not create the insurgency, but its impact on resource scarcity created fertile ground for recruitment and intensified the conflict, blurring the lines between environmental degradation, economic grievance, and political violence.

Similarly, the farmer-herder conflicts that have plagued many parts of Sub-Saharan Africa, notably in Nigeria's Middle Belt, are intrinsically linked to climate-induced pressures. As desertification and drought push pastoralist communities from the Sahel southward in search of pasture and water, they increasingly come into conflict with settled agricultural communities (IPCC, 2022). These conflicts, often framed in ethnic or religious terms, have at their core a fundamental struggle over resources made scarcer by a changing climate. The failure of state institutions to mediate these disputes, manage land use, and provide security for all citizens exposes and deepens state fragility, eroding the social contract between the government and its people (Eke & Oji, 2022).

This erosion of the state's capacity to manage resources and provide security is a hallmark of the climate-induced political crisis. When governments are unable to respond effectively to climate shocks, be it a devastating cyclone in Mozambique or a prolonged drought in the Horn of Africa, their legitimacy is called into question. Repeated failures can lead to a loss of public trust, creating space for non-state actors, from warlords to extremist groups, to assert control and offer alternative forms of governance (Busby, 2021). Climate change, in this sense, is a direct assault on state capacity and sovereignty.

1.2 Climate-Induced Migration and Urban Instability

A second critical manifestation of the political crisis is climate-induced migration. The World Bank estimates that without urgent climate action, there could be over 216 million internal climate migrants by 2050 across six major regions, including Sub-Saharan Africa, South Asia, and Latin America (Clement et al., 2021). This is not just a humanitarian issue; it is a profound political and social challenge.

Migration, whether internal or cross-border, is rarely a smooth process. It places immense strain on the resources and social fabric of receiving communities.

In emerging economies, the primary destination for most internal migrants is urban centres, many of which are already struggling with inadequate infrastructure, informal settlements, and overstretched public services. The rapid, unplanned influx of climate migrants often the poorest and most vulnerable who have lost their rural livelihoods, can exacerbate urban instability (Abel et al., 2019). Competition for jobs, housing, water, and sanitation in these urban hotspots can fuel social tensions and lead to political unrest.

For example, cities like Dhaka in Bangladesh and Lagos in Nigeria are experiencing explosive growth, partly driven by rural inhabitants fleeing sea-level rise, coastal erosion, and failing agriculture. These megacities are becoming mosaics of extreme wealth and extreme vulnerability, with vast informal settlements that are themselves highly exposed to climate risks like flooding and disease outbreaks (IPCC, 2022). The inability of municipal governments to provide basic services and integrate these new populations can lead to a breakdown in social order and create new forms of political grievance. The urban slum, in this context, becomes a tinderbox of climate-related risks and political discontent.

Cross-border migration also carries significant political risks. While most climate migration is internal, international movements, such as those from Central America's "Dry Corridor" towards the United States, are increasingly linked to climate factors like crop failure and hurricanes (IOM, 2021). This can strain diplomatic relations, fuel nationalist and anti-immigrant sentiment in destination countries, and create complex challenges for regional governance. For the states of origin, the loss of their working-age population represents a significant "brain drain" and a further hollowing out of their national capacity.

1.3 Geopolitical Tensions and the Politics of Responsibility

On the international stage, climate change is creating new fault lines and exacerbating existing geopolitical tensions. The first and most prominent of these is the persistent conflict over historical responsibility and the distribution of the burden of climate action.

Emerging economies, led by powerful voices like China, India, Brazil, and the "G77 plus China" bloc, have consistently and correctly argued that developed nations, which are responsible for the vast majority of historical greenhouse gas emissions, have a moral and legal obligation to lead on mitigation and provide financial and technological support to developing countries (UNFCCC, 2015). This principle of "Common but Differentiated Responsibilities and Respective Capabilities" is enshrined in international climate law but remains a major point of contention.

The failure of developed countries to meet their commitments, such as the long-promised $100 billion per year in climate finance, has created a deep sense of mistrust and injustice, poisoning international climate negotiations (Roberts et al., 2021). This finance gap is not just a technical issue; it is a profound political one. It signals to the Global South that the international system is not willing to address the climate crisis on an equitable basis, undermining the very spirit of multilateralism.

Furthermore, climate change is opening up new arenas for resource competition. The melting of Arctic ice, for example, is creating new shipping routes and opening up access to vast reserves of oil, gas, and minerals. This has triggered a new "Great Game" in the High North, with Arctic and non-Arctic states, including Russia, the United States, and China, jockeying for influence and control (Lanteigne, 2021). While this may seem distant from the concerns of emerging economies, it is indicative of a world where environmental change creates new geopolitical flashpoints.

Closer to home, transboundary water resources are becoming a major source of tension. The construction of the Grand Ethiopian Renaissance Dam (GERD) on the Blue Nile, for instance, has created a high-stakes diplomatic standoff between Ethiopia, Egypt, and Sudan. While the dam is a critical development project for Ethiopia, Egypt, which relies on the Nile for over 95% of its freshwater, views it as an existential threat. Climate change adds a dangerous layer of uncertainty to this dispute. As rainfall patterns in the Ethiopian highlands become more volatile, the management of water flows becomes even more critical and contentious, increasing the risk of conflict in an already unstable region (Swain, 2021).

Similar tensions are simmering over shared river basins across Asia, from the Mekong to the Indus, as upstream countries build dams and climate change alters water availability. In this new geopolitical landscape, water is the new oil, and climate change is the unpredictable variable that could ignite long-dormant disputes.

2. THE ECONOMIC CRISIS DIMENSION OF CLIMATE CHANGE

Parallel to the political crisis, climate change operates as a slow-moving but relentless economic catastrophe. In his seminal report, Nicholas Stern (2007) famously described climate change as "the greatest and widest-ranging market failure ever seen." Over a decade later, the evidence has only grown stronger. Climate change attacks economic stability on multiple fronts: it inflicts direct damage on assets and output, disrupts critical economic sectors, creates enormous fiscal pressures, and undermines the financial system itself. For emerging economies, whose growth models are often fragile and dependent on climate-sensitive sectors, this economic assault poses a fundamental threat to their development aspirations.

Macroeconomic Impacts: Growth, Inflation, and Fiscal Stability

The most direct economic impacts of climate change are felt at the macroeconomic level. Extreme weather events—such as floods, hurricanes, and droughts, are becoming more frequent and intense, and they act as massive negative shocks to national economies. A single major disaster can wipe out a significant portion of a country's GDP. When Hurricane Maria struck Dominica in 2017, for instance, it caused damages equivalent to 226% of the country's GDP, effectively erasing decades of development progress (World Bank, 2018). While this is an extreme case for a small island state, larger emerging economies are not immune. The 2022 floods in Pakistan submerged one-third of the country, inflicted an estimated $30 billion in damages and economic losses, and pushed millions into poverty, dealing a devastating blow to an already struggling economy (Government of Pakistan, 2022).

Beyond the immediate shock of disasters, the gradual effects of climate change, such as rising average temperatures, also act as a significant drag on economic growth. Research by the IMF has shown that for the median emerging market economy, a 1°C increase in temperature can reduce per capita GDP growth by as much as 1.5 percentage points in that year (Acevedo et al., 2020).

This effect is particularly pronounced in countries with hot climates, where rising temperatures reduce labour productivity (especially in outdoor sectors like agriculture and construction), suppress agricultural yields, and strain energy grids. This "growth penalty" means that emerging economies have to run faster just to stand still, making it exponentially harder to catch up with advanced economies.

Climate change also fuels inflation. Extreme weather events disrupt supply chains, damage transportation infrastructure, and reduce agricultural output, all of which lead to price spikes for essential goods like food and energy. The droughts that have afflicted parts of South America, for example, have driven up global prices for key commodities like coffee and soybeans. For low-income households in emerging economies, who spend a large proportion of their income on food, this climate-driven inflation is a direct assault on their well-being, eroding their purchasing power and pushing them deeper into poverty (Faccia et al., 2021).

These impacts coalesce to create a severe fiscal crisis for governments. On the one hand, government revenues decline as economic activity slows and key sectors suffer. On the other hand, government expenditures soar. There are the immediate costs of disaster relief and reconstruction, which can be enormous. There are also the long-term costs of adapting to new climate realities, such as building sea walls, developing drought-resistant crops, and strengthening public health systems. This creates a dangerous "fiscal pincer movement," where revenues fall just as spending needs rise. For many emerging economies already burdened by high levels of debt, this can lead to a sovereign debt crisis, forcing them to choose between servicing their debt and investing in climate resilience and sustainable development (Volz et al., 2021). The climate crisis is, therefore, also a debt crisis.

Sectoral Devastation: Agriculture, Infrastructure and Tourism

The macroeconomic impacts are an aggregation of severe disruptions at the sectoral level. Three sectors that are particularly vital for emerging economies, agriculture, infrastructure, and tourism, are on the front lines of the climate crisis.

Agriculture remains the backbone of many emerging economies, often employing the majority of the workforce and providing the foundation for food security. This sector is uniquely vulnerable to climate change. Shifting rainfall patterns, rising temperatures, and the increased frequency of droughts and floods directly impact crop yields and livestock health. The IPCC (2022) reports with high confidence that climate change has already negatively affected agricultural productivity across Africa, Asia, and Latin America. In Sub-Saharan Africa, for example, yields for staple crops like maize and sorghum have declined in many regions due to heat and drought stress. This not only threatens the livelihoods of millions of smallholder farmers but also jeopardizes national food security, potentially leading to increased reliance on volatile international food markets and a greater need for humanitarian aid (Mbow et al., 2019).

Infrastructure, the roads, ports, power plants, and communication networks that are the arteries of a modern economy, is being systematically degraded by climate change. Much of the existing infrastructure in emerging economies was built based on historical climate data and is not designed to withstand the new extremes. Coastal infrastructure, including major port cities like Mumbai, Lagos, and Bangkok, is under direct threat from sea-level rise and more intense storm surges. Roads and bridges are being washed away by unprecedented floods, while extreme heat can buckle railway lines and damage power grids. The costs of climate-proofing existing infrastructure and building new, resilient systems are astronomical, running into the trillions of dollars globally, a sum far beyond the capacity of most emerging economies to finance on their own (Rozenberg & Fay, 2019). The failure to do so, however, means that economic activity will be perpetually disrupted, and the cost of doing business will rise, making these economies less competitive.

Tourism, a critical source of foreign exchange and employment for many emerging economies from the Caribbean to Southeast Asia, is also highly vulnerable. The natural assets that attract tourists—coral reefs, beaches, and unique ecosystems, are being degraded by climate change. Rising sea temperatures cause coral bleaching, destroying the vibrant reefs that support dive tourism. Sea-level rise erodes the sandy beaches that are the centerpiece of coastal resorts. Changes in weather patterns can make tourist destinations less appealing or increase the risk of disruption from extreme weather during peak seasons. For small island developing states (SIDS), where tourism can account for over 50% of GDP, this is an existential economic threat (Scott et al., 2012).

Market Failures and the Financial System

The economic crisis of climate change is underpinned by a series of profound market failures. The most fundamental of these, as identified by Stern (2007), is that the price of goods and services that involve greenhouse gas emissions does not reflect the true cost of the damage those emissions cause to society. This negative externality has led to a massive over-investment in fossil fuels and an under-investment in clean technologies.

In recent years, the focus has expanded to how climate change poses a systemic risk to the financial system. Central banks and financial regulators are now increasingly aware of two main types of climate-related financial risk (NGFS, 2020):

Physical Risk; These are the risks arising from the direct impacts of climate change. For example, a bank that has issued mortgages for coastal properties faces significant losses if those properties are destroyed by a storm surge. An insurance company faces bankruptcy if it has to pay out claims for multiple, unprecedented disasters.

Transition Risks; These are the risks that arise from the process of transitioning to a low-carbon economy. For example, a pension fund that is heavily invested in fossil fuel companies could suffer massive losses if those companies' assets become "stranded" due to stricter climate policies or the falling cost of renewable energy.

For emerging economies, these financial risks are particularly acute. Their financial systems are often less developed and have a lower capacity to absorb shocks. Their economies are frequently dependent on sectors that are exposed to high physical risks (like agriculture) or high transition risks (like oil and gas production). A sudden, disorderly transition away from fossil fuels could trigger a financial crisis in a country like Nigeria or Angola, whose government revenues are heavily dependent on oil exports (Volz et al., 2021).

The challenge, therefore, is to manage this transition in a way that is both rapid enough to meet climate goals and orderly enough to avoid catastrophic economic disruption.

3. IMPLICATIONS FOR SUSTAINABLE DEVELOPMENT

The 2030 Agenda for Sustainable Development, with its 17 SDGs, represents a global consensus on the path to a more prosperous, equitable, and sustainable world. It is an integrated and indivisible agenda, meaning that progress on one goal is linked to progress on others. The dual political and economic crisis of climate change represents the single greatest threat to this agenda. It does not just impede progress on the environmental goals; it actively reverses gains in poverty reduction, health, education, and economic inclusion, creating a vicious cycle where climate impacts deepen development deficits, and development deficits increase vulnerability to climate impacts.

Undermining the Core Mandate: Poverty, Hunger, and Health (SDGs 1, 2, and 3)

At its core, the sustainable development agenda is about alleviating human suffering and expanding human capabilities. Climate change is a direct assault on this mandate.

SDG 1: No Poverty. Climate change is a powerful driver of poverty. The World Bank estimates that climate change could push an additional 132 million people into extreme poverty by 2030 (Jafino et al., 2020). The mechanisms are clear and brutal. Poor households are disproportionately affected by climate shocks because they have fewer assets to lose, are more likely to live in high-risk areas, and have limited access to social safety nets or insurance.

When a drought destroys a smallholder farmer's crop, their only source of income and food, it can trap their family in a cycle of debt and poverty for generations. The economic drag of climate change also reduces the overall resources available for poverty reduction programs, while the fiscal crisis it creates can force governments to implement austerity measures that hurt the poor the most.

SDG 2: Zero Hunger. The link between climate change and food insecurity is perhaps the most direct and alarming. As detailed in the previous section, climate change is already reducing yields of staple crops across the Global South (IPCC, 2022). It disrupts all four pillars of food security: availability (through lower production), access (through higher food prices and disrupted supply chains), utilization (through impacts on water quality and sanitation), and stability (through increased volatility in production). The result is a looming threat of widespread hunger and malnutrition, particularly for the world's most vulnerable populations. The goal of achieving Zero Hunger by 2030 is becoming increasingly unattainable in a world of accelerating climate change.

SDG 3: Good Health and Well-being. Climate change impacts human health through a multitude of pathways. Extreme heat is a direct cause of mortality, particularly for the elderly, children, and outdoor workers. Climate change is also altering the geographic range and seasonality of vector-borne diseases like malaria and dengue fever, exposing new populations to these illnesses (Caminade et al., 2019). Malnutrition resulting from food insecurity weakens immune systems, making people more susceptible to disease. Furthermore, climate-related disasters can destroy health infrastructure and displace populations, disrupting access to essential health services. The mental health impacts of living with the constant stress of climate change, eco-anxiety, and the trauma of surviving disasters, are also a growing concern (Obradovich et al., 2018).

Derailing Economic Transformation (SDGs 7, 8, and 9)

The SDGs envision a profound economic transformation, shifting economies towards a model that is sustainable, inclusive, and resilient. Climate change threatens to derail this transformation at every turn.

SDG 7: Affordable and Clean Energy. The transition to clean energy is central to both climate mitigation and sustainable development. However, for many emerging economies, this transition is fraught with challenges. They face the dual task of expanding energy access to the millions who still lack it while simultaneously decarbonizing their energy systems. This requires massive investments in renewable energy infrastructure, which are often difficult to secure due to high upfront costs and perceived investment risks (IEA, 2021).

The political economy of many emerging nations is also dominated by vested interests in the fossil fuel industry, creating significant political barriers to change. The failure to navigate this transition successfully will not only exacerbate climate change but also lock these economies into a high-carbon, high-pollution development path.

SDG 8: Decent Work and Economic Growth. Climate change directly undermines the goal of achieving sustained, inclusive, and sustainable economic growth. As established by the IMF (Acevedo et al., 2020), rising temperatures impose a direct "growth penalty" on emerging economies. The destruction of assets and disruption of key sectors like agriculture and tourism lead to job losses and reduced economic output. The transition to a low-carbon economy also presents challenges for employment, as jobs are lost in declining fossil fuel industries. While the green economy will create new jobs, ensuring a "just transition" that provides retraining and social support for affected workers is a major policy challenge (ILO, 2018).

SDG 9: Industry, Innovation, and Infrastructure. The goal of building resilient infrastructure is directly at odds with the physical impacts of climate change. As previously discussed, a significant portion of existing infrastructure in emerging economies is not fit for the new climate reality. The massive investments required to build resilient infrastructure compete for scarce public funds with other critical development priorities like health and education. The failure to make these investments, however, will result in a perpetual cycle of destruction and reconstruction, trapping economies in a state of arrested development.

The Cascading Impact on Other SDGs

The integrated nature of the SDGs means that the impacts of climate change cascade across the entire agenda.

SDG 5 (Gender Equality): Women and girls are often disproportionately affected by climate change. They make up the majority of the world's poor and are more dependent on natural resources for their livelihoods. In many cultures, they are responsible for collecting water and fuel, tasks that become more arduous and time-consuming as resources become scarcer.

They also face increased risks of violence and exploitation in the aftermath of disasters (UN Women, 2022).

SDG 6 (Clean Water and Sanitation): Climate change affects both the quantity and quality of water resources. Droughts reduce water availability, while floods can contaminate water sources, leading to outbreaks of waterborne diseases.

SDG 11 (Sustainable Cities and Communities): The rapid, unplanned urbanization driven by climate migration is making it harder to build cities that are inclusive, safe, resilient, and sustainable.

SDG 16 (Peace, Justice, and Strong Institutions): As detailed in the political crisis section, climate change fuels conflict, erodes governance, and weakens institutions, directly undermining the goal of creating peaceful and inclusive societies.

In essence, climate change is not just another challenge to be managed alongside the SDGs. It is the corrosive context in which the entire 2030 Agenda must be pursued. It acts as a powerful headwind, pushing back against progress on every front and threatening to unravel decades of development gains.

CONCLUSION AND THE PATH FORWARD: FROM CRISIS TO TRANSFORMATION

This chapter has argued that climate change is not merely an environmental issue but a systemic crisis that manifests as a dual political and economic assault on the foundations of societal stability and prosperity, with particularly severe implications for emerging economies. It functions as a potent political "threat multiplier," eroding state capacity, fueling resource conflicts, and straining the international order.

Simultaneously, it acts as a relentless economic shock, dragging down growth, destroying capital, and creating crippling fiscal burdens. The inescapable conclusion is that this dual crisis represents the single greatest obstacle to the achievement of the Sustainable Development Goals, threatening to reverse hard-won development gains and lock the world's most vulnerable nations in a cycle of poverty and instability.

The evidence presented paints a grim picture of a world where the pursuit of sustainable development is fundamentally at odds with the trajectory of a destabilizing climate. The very systems that emerging economies rely on for their development, agriculture, infrastructure, stable governance, are being systematically undermined. The result is a vicious feedback loop: climate impacts exacerbate poverty and fragility, and poverty and fragility reduce the capacity to adapt to climate change. Breaking this cycle is the defining challenge of our time.

In conclusion, rethinking development in any emerging economy, is now inseparable from rethinking our relationship with the planet. The dual political and economic crisis of climate change has redrawn the map of global development. The linear path of progress has been replaced by a far more treacherous landscape. For emerging economies, the challenge is to navigate this landscape not just to survive, but to transform to build new models of development that are resilient, equitable, and sustainable in a world irrecoverably altered by climate change. It is a task of historic proportions, and one on which our collective future depends.

Navigating this complex crisis requires a paradigm shift in our approach to both development and climate policy. Incremental adjustments and siloed solutions are no longer adequate. The path forward must be one of systemic transformation, built on the principles of integration, equity, and resilience. Several key pillars for this transformation can be identified:

1. Mainstreaming Climate Resilience into All Development Planning: Climate change can no longer be the sole responsibility of environment ministries. It must be integrated into the core of all economic and development planning. Finance ministries must conduct climate-risk assessments of national budgets. Infrastructure ministries must mandate climate-resilient design standards for all new projects.

Agriculture ministries must prioritize the transition to climate-smart agriculture. This "whole-of-government" approach is essential to ensure that development choices do not inadvertently create new climate vulnerabilities.

2. A Just and Accelerated Energy Transition: For emerging economies, the transition to clean energy is a monumental challenge but also a historic opportunity.

It offers a path to energy security, reduced air pollution, and new green jobs. However, this transition must be just. It requires massive international support, in the form of concessional finance and technology transfer, to de-risk investments in renewable energy. It also requires domestic policies that protect workers and communities who are dependent on the fossil fuel economy, ensuring that no one is left behind.

3. Reforming the International Financial Architecture: The current international financial system is not fit for purpose in an era of climate crisis. The immense costs of adaptation and the energy transition cannot be met by the domestic resources of emerging economies alone, especially given the fiscal pressures they face. A fundamental reform of the World Bank, the IMF, and the multilateral development banks is needed to align their lending practices with climate goals and to dramatically scale up the provision of climate finance. This includes finding real solutions to the mounting debt crisis, such as debt-for-climate swaps and the inclusion of climate-resilience clauses in sovereign debt instruments.

4. Investing in Adaptive Capacity and Social Protection: Even with ambitious mitigation, a certain amount of climate change is already locked in. Investing in adaptation is therefore not a choice but a necessity. This includes both "hard" adaptation, like building sea walls, and "soft" adaptation, like developing early warning systems and climate-resilient agricultural practices. Critically, it also includes strengthening social protection systems. Adaptive social safety nets—such as cash transfer programs that can be scaled up quickly after a disaster—are essential tools for helping the poorest households absorb climate shocks and avoid falling into poverty.

5. Revitalizing Multilateralism and Climate Justice: Ultimately, the climate crisis can only be solved through collective global action. This requires rebuilding trust in the multilateral system.

For this to happen, developed nations must finally make good on their historical responsibilities. This means delivering on their climate finance commitments, leading the way with ambitious emissions cuts, and engaging with the Global South as genuine partners in a shared global project.

The principle of climate justice must be at the heart of this renewed multilateralism, recognizing that those who have done the least to cause the crisis are suffering the most and require the greatest support.

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CHAPTER 5
GLOBAL GOVERNANCE AND INSTITUTIONAL RESPONSES TO CRISES

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INTRODUCTION

Political and economic crises have occurred often throughout the history of international relations. Crises, according to International Political Economy (IPE), are more than just financial shocks or economic slowdowns; they are also occasions of political transformation, institutional upheaval, and tests of legitimacy for global governance (Helleiner, 2014). Crises can arise from a variety of sources, including structural imbalances in the international financial system, geopolitical tensions, climate change, and global pandemics, and they almost always have multidimensional consequences that cross national borders (Keohane, 1984; Tooze, 2018).

Crises are no longer solely domestic problems in the era of globalization. Shocks in one area can swiftly spread to others due to the intricate interconnection of international political and economic systems. For instance, the 2008 U.S. subprime mortgage crisis quickly spread around the world, affecting capital markets in Europe, Asia, and Latin America (Roubini & Mihm, 2010). Similarly, the COVID-19 pandemic, which began as a public health emergency in one nation, quickly escalated into a global disaster that impacted global trade, tourism, supply chains, and political stability (Baldwin & di Mauro, 2020; World Health Organization, 2021). These instances highlight the importance of coordinated actions through international organizations established to maintain global stability.

Crises are often viewed in the IPE literature as "critical junctures" that both show the weaknesses of global governance and offer opportunities for reform (Blyth, 2002; Hall, 1993). Important roles in crisis management have been performed by ad hoc meetings like the G20 and international institutions like the United Nations (UN), World Bank, World Trade Organization (WTO), and International Monetary Fund (IMF). Their effectiveness is still up for discussion, though. Some academics highlight their achievements in maintaining global cooperation and stabilizing markets (Ikenberry, 2011), while detractors draw attention to their prejudices against developed nations, lax accountability systems, and inability to generate inclusive and long-lasting solutions (Stiglitz, 2002; Woods, 2006).

Against this context, this chapter aims to give a thorough examination of how global governance responds to political and economic crises that destabilize the international order. The analysis includes a mapping of theoretical frameworks for understanding crisis dynamics, a historical overview of major crises that resulted in or reshaped global governance institutions, and contemporary case studies on the 2008 global financial crisis, the COVID-19 pandemic, and the climate crisis. Using this holistic approach, the chapter seeks to answer numerous fundamental concerns, including how international institutions impact responses to global crises. What structural barriers limit the efficacy of these interventions? What institutional improvements are required to strengthen global governance's ability to deal with future crises? Thus, the chapter not only examines historical and current solutions, but also provides a critical appraisal of the future possibilities for global governance.

The chapter is divided into seven sections. Following the introduction, the second section looks at pertinent IPE theories for explaining institutional responses to crises. The third section offers a historical review of international institutions' role in key crises, ranging from the Great Depression of the 1930s to the Asian Financial Crisis of 1997. The fourth portion examines modern case studies, focusing on the 2008 global financial crisis, the COVID-19 epidemic, and the climate catastrophe. The fifth part addresses fundamental difficulties to global governance, such as legitimacy, accountability, power imbalance, and institutional fragmentation. The sixth segment examines critical changes and future perspectives for global governance. The chapter finishes by noting global governance's shortcomings and prospects in dealing with upcoming crises.

The chapter seeks to accomplish this by advancing theoretical debates on global governance and offering useful perspectives on how international organizations function in negotiating the unpredictabilities of a world that is becoming more complicated. Crises provide chances to develop a more responsive, adaptable, and inclusive global governance framework that reflects the needs of the global community, in addition to being threats.

1. THEORETICAL FRAMEWORK

The study of global governance and institutional responses to crises intersects with important theories in International Political Economy (IPE) and International Relations. Each theoretical approach offers a different analytical perspective for analyzing how and why international institutions respond to crises, including their efficacy, legitimacy, and reform trajectory. By revisiting these basic views, we may gain a better understanding of the processes that shape global institutions' conduct.

Realism and Power Politics

Realists see international institutions as tools for powerful governments to further their own interests. Realists believe that the state is the key player in an anarchic international system, with global institutions reflecting power distribution (Mearsheimer, 1994). Crisis reactions are not displays of global unity, but rather the result of great power negotiations. The United States' overwhelming participation in the IMF and World Bank since the Bretton Woods era exemplifies this thinking.

The Asian financial crisis of 1997, for example, demonstrated how IMF structural adjustment measures coincided with the objectives of industrialized countries, notably the United States, by prioritizing market liberalization and deregulation (Stiglitz, 2002). Similarly, the G20's transition during the 2008 crisis might be seen via realist lenses: the meeting served as a coordinating space for global economic elites while being controlled by the world's largest economies.

Liberal Institutionalism

Liberal institutionalism, on the other hand, emphasizes the function of international institutions in facilitating inter-state collaboration. Institutions decrease transaction costs, give information, and set up conflict resolution systems (Keohane, 1984). From this perspective, crises provide chances for international organizations to broaden their duties. The 2008 global financial crisis is a vivid example: the G20 agreed on fiscal stimulus, reinforced the IMF, and improved international financial regulation (Helleiner, 2014).

Although flawed, this cooperation demonstrates the ability of global institutions to function as collective problem-solving mechanisms. The COVID-19 pandemic also highlighted the significance of the WHO in advocating international measures, despite limited resources and member nations' domestic politics limiting its efficacy.

Constructivism

Constructivist methods highlight the significance of norms, ideas, and identities in forming institutional responses (Wendt, 1999). International institutions are not just venues of power, but also locations for creating the meaning of crises. Climate change, for example, is viewed not only as an environmental concern, but also as an existential danger to mankind. The Paris Agreement exemplifies how the principle of shared but differentiated responsibilities has influenced both international and domestic governance. During the COVID-19 pandemic, global solidarity and vaccination equality emerged as key normative concerns (Bollyky & Bown, 2020), but its execution frequently conflicted with entrenched national interests.

Critical Political Economy and Dependency Perspectives

Critical theories in IPE reveal the systemic disparities that underpin global governance. According to dependency theory and world-systems views, organizations such as the IMF and World Bank frequently maintain global hierarchies between the Global North and the Global South (Cox, 1981; Wallerstein, 2004). The structural adjustment initiatives of the 1980s and 1990s shown how the pursuit of global economic stability frequently came at the price of social development in developing countries.

Critics also point to a democratic deficit in organizations like the IMF and WTO, where crucial decisions are taken by a small group of governments and technical elites, frequently without widespread participation (Woods, 2006). Thus, crises reveal not only market or state failings, but also the limitations of global frameworks in promoting social and economic fairness.

Postcolonial and Global South Perspectives

Postcolonial theories emphasize the Global North's bias in defining and addressing crises. The 2008 financial crisis, for example, was referred to as a "global crisis" despite the fact that its most severe consequences were focused in industrialized economies, while many developing nations saw relatively stable development (Grabel, 2018). Similarly, the COVID-19 epidemic revealed huge disparities in vaccination access between affluent and poorer countries, despite the ongoing rhetoric of global unity. This viewpoint advocates for reforms to a more inclusive global governance architecture, particularly increasing the involvement of regional groups like the African Union, ASEAN, and CELAC in international decision-making.

Synthesis and Analytical Lens

Institutional reactions to global crises cannot be adequately explained by a single theoretical paradigm. Constructivism highlights how norms and ideas shape how crises are perceived, liberalism stresses collaboration and international institutions, realism stresses the division of power among major states, and critical and postcolonial approaches expose structural injustices and hegemonic dynamics in global governance. Therefore, this chapter adopts a synthetic approach that integrates lessons from these many points of view in order to comprehend the intricacies of global governance during times of crisis.

The analysis will be organized around three main dimensions: first, power and interests—who controls decision-making processes; second, institutions and mechanisms—how international organizations coordinate collective responses; and third, norms and legitimacy—what values underpin such responses and how widely accepted they are by the international community. Using this analytical framework, the chapter conducts a historical assessment of how international institutions have responded to crises across time before moving on to modern case studies.

Table 1. Comparative Theoretical Perspectives on Global Governance and Crisis Response

Theoretical Approach	Core Assumptions	Key Actors	View of Institutions	Implications for Crisis Response
Realism	International system is anarchic; states pursue power and security; institutions reflect power distribution.	Great powers, especially hegemonic states.	Tools of powerful states; secondary to national interests.	Crisis responses depend on power politics and bargaining among major states (e.g., IMF conditionality, G20 dominated by major economies).
Liberal Institutionalism	Cooperation is possible through institutions; they reduce transaction costs and provide information.	States as rational actors seeking absolute gains.	Platforms that facilitate cooperation and coordination.	Crises create opportunities for stronger cooperation and institutional innovation (e.g., G20 reforms in 2008, WHO in pandemic response).
Constructivism	Norms, ideas, and identities shape state behavior; interests are socially constructed.	States, international organizations, epistemic communities.	Arenas for norm creation, identity building, and social learning.	Crises reframe shared meanings and norms (e.g., Paris Agreement norms of climate justice, vaccine solidarity debates).
Critical Political Economy/ Dependency	Global economy structured by inequality; institutions reproduce dominance of Global North.	Core vs. periphery states; global elites.	Mechanisms of structural domination and hegemony.	Crises expose systemic inequities (e.g., structural adjustment, democratic deficit in IMF/WTO).
Postcolonial/ Global South Perspectives	Knowledge and power biased toward Global North; Global South marginalized.	Postcolonial states, regional organizations.	Often exclusionary; legitimacy crisis due to Northern dominance.	Call for inclusive reforms, regional alternatives, and recognition of Global South agency (e.g., vaccine inequity, role of AU/ASEAN/CELAC).

Source: Author's processed results (2025).

2. HISTORICAL OVERVIEW OF GLOBAL GOVERNANCE IN CRISES

The study of global governance and crisis responses is inextricably linked to the lengthy history of international institutional evolution. Throughout the twentieth century, periodic global crises have prompted the formation, consolidation, or reform of international organizations. Crises thus not only represent the breakdown of current governance systems, but they also act as catalysts for institutional innovation.

Interwar Period and the League of Nations

The first big crises to form current global institutions were World War I and the Great Depression of the 1930s. The League of Nations was founded in 1919 as an early attempt to form an international organization capable of averting war via collective diplomacy (Mazower, 2012). However, institutional problems and the absence of significant countries like the United States hampered its ability to respond effectively. The Great Depression highlighted a lack of international coordination, as protectionism and competitive devaluations exacerbated the global economic crisis. The collapse of the League of Nations and the inadequate financial institutions of the time taught important lessons for the postwar system.

The Bretton Woods System and Post-War Governance

World War II and the subsequent global economic turbulence resulted in the 1944 Bretton Woods Conference, which established a new global governance framework. The IMF and World Bank were founded to help stabilize the international monetary system and facilitate postwar rebuilding. The Bretton Woods system, which relied on fixed exchange rates pegged to the US dollar, provided relative stability until the early 1970s (Helleiner, 1994). The IMF served as a lender of last resort for short-term loans, whereas the World Bank promoted long-term growth. Initially focused on Europe's recovery, both organizations eventually emerged into key players in addressing crises in developing economies.

The Oil Shocks and the Debt Crisis of the 1980s

The 1973 and 1979 oil shocks, followed by the 1980s Latin American debt crises, demonstrated the relationship between global economic instability and domestic structural weaknesses. The IMF and World Bank reacted with structural adjustment plans that prioritized liberalization, deregulation, and privatization (Babb, 2013). These policies drew severe criticism for hurting social development and increasing reliance on international organizations. Mexico's 1982 financial crisis represented a watershed moment, with the IMF serving as a de facto global lender of last resort. However, the Bretton Woods institutions faced rising legitimacy issues, with critics claiming that they prioritized the interests of wealthy donor countries.

The End of the Cold War and Globalization Crises

The conclusion of the Cold War marked the beginning of a new age of increased globalization. The 1997–1998 East Asian financial crisis exposed emerging markets' vulnerability to fluctuating capital flows. The IMF once again played an important role, although its policy prescriptions, known as "IMF conditionality," were accused of aggravating societal distress and impeding recovery (Stiglitz, 2002). This sparked talks about overhauling global financial governance and elevated informal groups like the G7 and, subsequently, the G20 in importance. Dissatisfaction with international institutions spurred regional alternatives, such as the 2000 Chiang Mai Initiative in East Asia, emphasizing the emergence of regional multilateralism as a complement and alternative to global governance.

The Global Financial Crisis of 2008

The 2008 global financial crisis is widely viewed as the most significant test of global governance since the Great Depression. The crisis originated in the US housing industry and extended globally due to financial interconnectedness. Institutional responses were more coordinated than in previous crises, with the G20 transitioning from a ministerial meeting to a leaders' summit as the primary platform for global economic cooperation. Countries implemented fiscal stimulus packages, improved international financial regulations, and increased IMF resources (Helleiner, 2014).

However, this collaboration quickly faded as domestic interests took precedence. Nonetheless, the crisis strengthened the G20's standing as a key organization in global economic governance.

Global Health Crises: HIV/AIDS and COVID-19

Beyond financial crises, global health emergencies have accelerated institutional development. The HIV/AIDS crisis of the 1980s prompted the establishment of UNAIDS and sparked widespread worldwide collaboration. However, the COVID-19 pandemic (2020-2022) highlighted the significant inadequacies of current health-care governance. The WHO battled with limited authority, insufficient financing, and the politicization of health issues (Gostin et al., 2020). COVAX vaccine distribution demonstrated the necessity of global cooperation while also revealing glaring discrepancies between affluent and underdeveloped countries. This highlighted basic concerns about the future of global health governance and readiness for future pandemics.

Climate Change as a Prolonged Global Crisis

Climate change, unlike episodic financial or health crises, is a structural and long-term global issue. Climate governance efforts date back to the 1972 Stockholm Conference and include the 1997 Kyoto Protocol and the 2015 Paris Agreement. Climate governance, unlike financial organizations like the IMF or G20, is based on long-term agreements about shared responsibility and intergenerational equality (Falkner, 2016). Controversial arguments regarding burden-sharing between wealthy and poor nations highlight the central problem of global governance: building solidarity in the face of historical inequity. Despite ongoing difficulties, global climate institutions continue to play an important role in furthering growing sustainability and collective responsibility standards.

Table 2. Historical Evolution of Global Governance in Response to Crises

Period / Crisis	Key Institutions	Main Responses	Challenges / Critiques	Legacy / Outcomes
Interwar Period (1919–1939)	League of Nations	Diplomacy to prevent war; collective security	Absence of US; weak enforcement; failed to handle Great Depression	Collapse of League, lessons for post-WWII institutional design
Post-War Governance (Bretton Woods, 1944–1970s)	IMF, World Bank	Stabilize monetary system; finance reconstruction	US dominance; limited to fixed exchange system	Stable post-war order; foundation of global financial governance
Oil Shocks & Debt Crisis (1970s–1980s)	IMF, World Bank	Structural adjustment programs (SAPs); loans to indebted states	Criticism for austerity and deepening inequality	Strengthened IMF role as lender of last resort; legitimacy questioned
Post-Cold War Globalization Crises (1990s)	IMF, G7/G20, regional initiatives (Chiang Mai)	Bailouts in Asia; IMF conditionality	Policies worsened social costs; push for regional alternatives	Rise of regionalism in financial governance; calls for reform
Global Financial Crisis (2008)	G20, IMF	Coordinated stimulus; expanded IMF resources; tighter financial regulation	Short-lived cooperation; return to domestic focus	Institutionalized G20 as key forum; IMF recapitalization
Global Health Crises (HIV/AIDS, COVID-19)	WHO, UNAIDS, COVAX	Global mobilization against HIV/AIDS; pandemic coordination during COVID-19	Funding shortages; vaccine inequity; politicization	New debates on global health governance and pandemic preparedness
Climate Change (1972–present)	UNFCCC, Kyoto Protocol, Paris Agreement	Long-term negotiations; commitments on mitigation & adaptation	North-South divide; disputes over burden-sharing	Institutionalization of climate governance; evolving norms of sustainability

Source: Author's processed results (2025).

3. CONTEMPORARY CASE STUDIES OF GLOBAL GOVERNANCE IN CRISES

Contemporary case studies demonstrate how international institutions respond to complex global crises. This section examines three key events: the WHO reaction to the COVID-19 pandemic, the G20's participation during the 2008 global financial crisis, and the Paris Agreement on climate governance. Each scenario demonstrates a unique dynamic in global governance, ranging from public health and economic stability to long-term environmental issues.

WHO and the COVID-19 Pandemic Response

The COVID-19 pandemic was the most serious challenge for the World Health Organization (WHO) since its inception in 1948. On January 30, 2020, WHO classified COVID-19 a Public Health Emergency of International Concern (PHEIC); nonetheless, the organization received significant criticism for the apparent delay in announcing a worldwide pandemic (World Health Organization, 2020).

Some commentators complained that WHO depended too heavily on member state information, notably from China, limiting its ability to issue early warnings (Lancet COVID-19 Commission, 2021). This constraint emphasizes systemic issues: WHO does not have the authority to independently evaluate national health statistics. The International Health Regulations process is entirely voluntary, which means that if a state delays reporting, the organization lacks effective enforcement powers (Gostin et al., 2015).

As the epidemic advanced, vaccination access gaps formed between the Global North and South. The COVAX program, sponsored by WHO in collaboration with Gavi and CEPI, was first presented as a global solidarity solution. However, in actuality, wealthier nations entered into bilateral deals with pharmaceutical corporations, resulting in unequal vaccination distribution (Bollyky & Bown, 2020). This scenario underlines a contradiction in global health governance: despite widespread support for solidarity, market processes and national interests continue to dominate.

While WHO was instrumental in fighting for vaccination fairness, budgetary and political restrictions hampered its efficacy. The COVID-19 crisis highlighted the need for global health governance reforms.

Proposals such as forming a Pandemic Treaty and increasing WHO budget represent attempts to solve systemic flaws exposed by the crisis. The COVID-19 instance indicates that WHO's legitimacy is dependent on its capacity to foster cross-national trust while also strengthening its technical and normative skills to address future health concerns (Moon et al., 2021).

G20 and the Global Financial Crisis of 2008

The 2008 global financial crisis established the G20 as the principal venue for international economic coordination. Prior to the crisis, the G20 served largely as a platform for finance ministers and central bank governors. However, since the Washington Summit in 2008, it has been raised to a conference of leaders of state and government. This transition represented a fundamental shift in the architecture of global economic governance, as the G20 effectively brought together established and emerging nations in a reasonably inclusive forum (Cooper & Thakur, 2013).

At the height of the crisis, the G20 responded with a coordinated set of policies aimed at stabilizing markets and averting a deeper global recession. A important policy was the commitment to execute a global fiscal stimulus through member-state cooperation, so maintaining aggregate demand and reducing further economic deterioration. Furthermore, the G20 enhanced the international regulatory framework by establishing the Financial Stability Board (FSB), which promotes new norms for cross-border financial monitoring and closes regulatory loopholes identified as crisis triggers. Importantly, member nations agreed to boost the International Monetary Fund's (IMF) financial capacity to USD 750 billion, allowing the organization to provide adequate liquidity, particularly to developing countries susceptible to the crisis (Helleiner, 2014). Collectively, these steps helped to stabilize international financial markets and promote the short-term global economic recovery.

Nonetheless, while the G20 was regarded successful in preventing a worldwide slump, its long-term usefulness is still debated. Intense budgetary cooperation was short-lived, as many nations started emphasizing domestic agendas in 2010. International financial reforms were also chastised for failing to address the underlying causes, while shadow banking activities and systemic vulnerabilities continued (Tooze, 2018).

Furthermore, the G20 encountered legitimacy difficulties due to a lack of formal legal underpinnings, and its exclusivity generated worries about poorer nations' involvement. Thus, while the G20 has shown competent in addressing acute crises, its long-term viability as a global governing structure is disputed.

The Paris Agreement and Climate Governance

Climate change is a worldwide issue with features that differ from economic and health disasters. The 1997 Kyoto Protocol set an early precedent by setting obligatory carbon reduction commitments, although it only applied to industrialized countries. This limitation sparked opposition, primarily from the United States, and hampered worldwide adoption. In response to these deficiencies, the 2015 Paris Agreement marked a watershed moment by adopting a more inclusive approach. Rather of imposing top-down objectives, the Agreement established Nationally Determined Contributions (NDCs), which let each nation to set emission reduction targets based on its capability (Falkner, 2016).

The Paris Agreement featured numerous significant institutional reforms that set it apart from prior climate regimes. The notion of universality is a significant breakthrough: all nations, developed and developing, are expected to submit NDCs, extending mitigation duties beyond developed states alone, as in the Kyoto Protocol. The Agreement also highlights the notion of flexibility, allowing nations to tailor mitigation and adaptation obligations to their own situations. The transparency structure provides frequent reporting and review of NDC implementation, hence increasing collective accountability. Furthermore, the climate financing pledge of USD 100 billion per year from rich to developing nations is a critical tool for supporting mitigation and adaptation activities. Through these measures, the Paris Agreement strikes a balance between the need for global efficacy in tackling climate challenges and the political legitimacy demands of a varied international society.

However, the Paris Agreement faces significant implementation hurdles. Voluntary national commitments are frequently inadequate to keep global temperature rises to 1.5-2°C, as specified in the Agreement.

Furthermore, affluent countries' climate funding obligations have yet to be fully implemented, weakening poor nations' faith in the regime. In this setting, non-state actors—such as companies, cities, and civil society—become increasingly important in closing ambition gaps (Hale, 2020). Climate problems, due to their lengthy duration, necessitate adaptable, responsible global governance based on intergenerational solidarity. While the Paris Agreement remains a watershed moment in global climate policy, its sustainability is ultimately dependent on continued collective political commitment in the coming years.

Comparative Insights from the Three Cases

These three case studies provide some crucial insights on global governance tendencies in crisis management. First, the time dimension of crises has a substantial effect on institutional responses. The COVID-19 epidemic necessitated immediate response within weeks or months, the 2008 global financial crisis necessitated medium-term fiscal coordination to stabilise markets, and climate change is a long-term concern with multi-decade perspectives that require intergenerational consistency. Second, institutionalization varies by case: WHO is a formal organization with an international legal mandate but limited capacity; the G20 serves as a relatively effective informal forum in the short term but lacks strong legal legitimacy; and the Paris Agreement is a hybrid regime that balances the flexibility of voluntary commitments with political legitimacy requirements.

Third, concerns of legitimacy and equality are crucial in all circumstances. WHO suffered trust deficits due to uneven vaccine distribution, the G20 was criticized for being an elitist platform that underrepresented poorer nations, and the Paris Agreement, while more inclusive, still has challenges in implementing affluent countries' climate funding obligations. Finally, the global allocation of power follows a fairly regular pattern: big powers such as the United States, China, and the European Union continue to dominate policymaking. Nonetheless, the engagement of Global South nations has grown, with key roles in global health agendas, international financial stability, and climate discussions, highlighting the need of multipolarity in modern global governance.

Table 3. Comparative Analysis of Global Governance Responses to Crises

Dimension	**WHO & COVID-19 Pandemic**	**G20 & 2008 Global Financial Crisis**	**Paris Agreement & Climate Governance**
Type of Crisis	Global health (pandemic)	Global economy (financial)	Global environment (climate)
Time Horizon	Urgent, weeks–months	Medium-term, annual coordination	Long-term, multi-decade
Institutional Form	Formal international organization with legal mandate (WHO, IHR)	Informal forum of heads of state/government (G20)	Hybrid international regime with voluntary commitments (NDCs)
Primary Response	PHEIC declaration, vaccine equity advocacy (COVAX), Pandemic Treaty proposals	Global fiscal stimulus, establishment of Financial Stability Board, IMF capital increase	NDC framework, transparency mechanisms, USD 100 billion climate finance commitment
Strengths	Technical and normative authority in global health	Rapid and inclusive coordination, short-term market stabilization	Universality and flexibility, inclusive of all countries, accountability via reporting
Limitations	Dependence on member-state data, enforcement constraints, vaccine inequity	Short-lived fiscal coordination, lack of formal legitimacy, exclusive membership	National commitments often insufficient, climate finance pledges partially unmet
Legitimacy & Equity Challenges	North–South disparities in vaccine access	Underrepresentation of poorer countries	Incomplete fulfillment of financial commitments, gaps in ambition
Role of Major Actors	US, China, EU dominate data, vaccines, policy	US, EU, China lead stimulus & regulation	US, EU, China influential; Global South advocates for equity
Key Lessons	Global health governance requires trust, technical capacity, and structural reform	Effective in acute crises but limited long-term authority	Climate governance demands sustained political commitment, adaptability, and intergenerational solidarity

Source: Author's processed results (2025).

4. KEY CHALLENGES IN INSTITUTIONAL RESPONSES

Global institutions have an important role in reacting to worldwide crises, which range from health and finance to security and climate change. However, institutional interventions are not without challenges. Even when a crisis is urgent, structural and political restrictions typically limit global governance's efficacy. This chapter discusses five important issues that frequently occur in institutional responses to global crises: legitimacy, accountability, power imbalance, governance fragmentation, and the growth of populism and nationalism, which threaten multilateralism.

Legitimacy: Representation and Inclusiveness

Legitimacy is one of the most important difficulties in world government. Many international organizations are seen as inadequately reflective of developing nations' concerns. The IMF and World Bank, for example, were founded in the post-World War II era with quota-based voting systems that reflected the economic dominance of the time. This arrangement gave the United States and Western European countries far more power than countries in the Global South (Woods, 2006). Although the 2010 IMF quota change strengthened the power of rising economies like China, India, and Brazil, poorer countries' voting percentages remain much lower than their global economic weight (Helleiner & Lundblad, 2017).

Developing nations typically feel sidelined during World Trade Organization talks. The Doha Round, which began in 2001 as a Development Round, stagnated owing to competing interests between the Global North and South, notably in terms of agricultural subsidies and market access (Narlikar, 2010). Such situations reinforce the notion that international organizations are insufficiently attentive to poorer nations' development requirements. Limited legitimacy diminishes political trust, which reduces commitment to follow agreed-upon standards. Thus, representation is more than just a technical issue with voting procedures; it also has implications for the long-term viability of global governance standards. Without solid legitimacy, institutional efficacy is always in doubt.

Accountability: Who is Responsible for Policy Failures?

The topic of duty is another often asked concern. Elections and legal procedures are two ways that governments might be held accountable at the national level. However, accountability procedures are far weaker on a worldwide scale. If IMF measures worsen a nation's financial crisis, who bears the blame? Or what if millions of people died as a result of the World Health Organization's tardy response to an outbreak?

Accountability difficulties come from the fundamental character of international organizations. Many global organizations are the result of international consensus, with decisions taken collaboratively. As a result, policy failures seldom have a single identifiable player to blame (Grant & Keohane, 2005). For example, the IMF was chastised for executing extremely rigorous structural adjustment programs in the 1980s and 1990s, which harmed social indices in Africa and Latin America. However, the IMF's culpability was frequently avoided on the basis that programs were jointly implemented with borrowing nations.

Following the 2014 Ebola epidemic, WHO drew strong criticism for delaying the designation of a Public Health Emergency. Although WHO has since implemented improvements, the underlying question remains: to what degree can international institutions be held accountable when they fail to meet their mandates? The lack of clear accountability systems threatens public faith in global organizations.

Power Asymmetry: Dominance of G7 and G20

Another major issue is power disparity among international organizations. Although forums like the G20 include emerging nations, the power of established economies remains strong. The G7, for example, remains a key player in determining global agendas in finance, trade, and security. The 2008 financial crisis dramatically demonstrated this dynamic. While the G20 was seen as more inclusive, core policy choices were largely influenced by G7 countries, notably the United States and the European Union (Cooper & Thakur, 2013).

The wealthiest donor nations continue to have significant influence over the IMF, giving them de facto veto power in decision-making.

The dominance of big powers causes unhappiness in the Global South countries. For example, Africa, which has 54 countries, has little representation in global forums, despite the fact that global policies have a large impact on regional concerns like debt and health. Power imbalance generates legitimacy gaps and fuels suspicion of multilateralism.

Fragmentation: Overlapping Regimes and Complexity

Global governance fragmentation is a significant concern. In many issues, no single institution has complete power. Instead, overlapping regimes, institutions, and procedures frequently exist under distinct mandates. In climate governance, for example, in addition to the UNFCCC and the Paris Agreement, there are bilateral, regional, and non-state efforts like C40 Cities and RE100. While this exhibits institutional inventiveness, it also causes coordination issues and forum shopping, in which nations choose the forum that best suits their interests (Keohane & Victor, 2011).

The overlapping missions of the World Bank, IMF, regional development banks, and bilateral institutions are examples of fragmentation in global finance. Recipient nations with different criteria are frequently confused by this. Similar to this, the advent of new programs like the Global Fund, Gavi, and CEPI in the field of global health adds complexity and may lead to competition rather than collaboration (Shiffman, 2009). Because fragmentation disperses resources and decreases coordination, it can make global crisis responses less effective.

Populism and Nationalism: The Erosion of Multilateralism

The emergence of nationalism and populism, which undermines multilateralism, is the last major issue of the last few decades. Often, crises intensify protective tendencies. While the WHO called for international unity during the COVID-19 epidemic, several nations imposed restrictions on the shipment of vaccinations and medical supplies (Bollyky & Bown, 2020). A good example of how domestic interests might take precedence over processes of global collaboration is vaccine nationalism. The Trump administration publicly weakened the WTO in trade by preventing the nomination of judges to the Appellate Body.

Trends to reject international accords that are seen as undermining national sovereignty have also been fueled by the development of populism in Europe and Latin America. The conundrum this dynamic creates is that although international crises necessitate tight cross-border collaboration, home political pressures force governments to give nationalist agendas first priority. As a result, political impetus for multilateralism frequently wanes, resulting in hesitant or uneven institutional reactions.

Table 4. Key Challenges in Institutional Responses to Global Crises

Challenge	Description	Illustrative Examples	Implications for Global Governance
Legitimacy: Representation and Inclusiveness	Global institutions are often perceived as underrepresenting developing countries' interests.	IMF & World Bank quota structures favoring the US and Western Europe; WTO Doha Round stalemate	Weak legitimacy undermines political trust and compliance with rules
Accountability: Responsibility for Policy Failures	Limited mechanisms to hold institutions accountable for adverse outcomes.	IMF structural adjustment programs worsening social indicators; WHO's delayed response to Ebola	Lack of accountability risks erosion of public and state trust in global institutions
Power Asymmetry: Dominance of Major Economies	Decision-making is heavily influenced by economically powerful states.	G7 setting key agendas in G20; IMF influenced by major donor countries	Creates inequities, reduces Global South influence, and undermines perceived fairness
Fragmentation: Overlapping Regimes and Complexity	Multiple overlapping institutions with different mandates reduce coordination.	Climate governance: UNFCCC, Paris Agreement, C40 Cities, RE100; Global Fund, Gavi, CEPI in health	Fragmentation disperses resources, fosters forum shopping, and limits effectiveness
Populism and Nationalism: Erosion of Multilateralism	Rising domestic political pressures undermine international cooperation.	Vaccine nationalism during COVID-19; Trump administration blocking WTO Appellate Body	Weakens multilateral mechanisms and produces inconsistent or half-hearted institutional responses

Source: Author's processed results (2025).

5. FUTURE PROSPECTS FOR GLOBAL GOVERNANCE

Global crises in recent decades have highlighted severe fundamental issues in international governance. However, in addition to the previously mentioned concerns of legitimacy, accountability, fragmentation, and populism, there are prospects for change and innovation. This chapter examines the future of global governance by focusing on five main issues: reforming multilateral institutions, the role of non-state players, digital and technology governance, altering power dynamics, and developing multilateral paradigms.

Reforming Multilateral Institutions

The capacity of existing multilateral organizations, such as the United Nations, International Monetary Fund, World Bank, World Trade Organization, and World Health Organization, to adapt to the changing global environment is critical to the future of global governance. Reforming representation is urgently required to keep these institutions relevant and credible. Quota and voting power adjustments are ongoing at the IMF and World Bank to reflect current economic realities, in which emerging nations have emerged as important drivers of global development (Chin, 2010). Failure to reform risks expanding legitimacy disparities and driving emerging economies to seek alternatives to the Bretton Woods system, such as the Asian Infrastructure Investment Bank (AIIB) and the BRICS-led New Development Bank (NDB).

The future of trade multilateralism at the WTO depends on rejuvenating the dispute settlement mechanism and realistically restarting the Doha Round. Without change, the world is likely to see fragmented, region-based trade accords like RCEP and CPTPP. WHO confronts similar issues. Following the COVID-19 pandemic, there has been a movement to improve WHO's mission and capabilities, including the possibility of establishing a pandemic treaty to offer more power over early detection, data exchange, and vaccine delivery (Gostin et al., 2022). Such adjustments are difficult but necessary for reestablishing global trust in international health governance.

The Rise of Non-State Actors

The future of global governance is increasingly reliant on non-state players. Non-state actors—such as multinational firms, civil society groups, city networks, and charitable institutions—play critical roles in tackling global crises. In climate governance, for example, technology and renewable energy firms have accelerated the green transition even as national governments remain politically limited. Global city networks, such as C40 Cities, pursue ambitious climate mitigation measures outside of international accords (Hale, 2020).

Philanthropic institutions like the Bill & Melinda Gates Foundation make major contributions to global health financing, while international non-governmental organizations (NGOs) continue to advocate for human rights, environmental preservation, and social justice. Integrating these players into global governance promotes a polycentric system in which power and legitimacy are spread at different levels (Ostrom, 2010). The future of governance is expected to be hybrid, with tight collaboration between states, international organizations, and non-state players.

Digital Governance and Technological Transformation

Advances in digital technology and artificial intelligence (AI) provide up new opportunities for global administration. Digital technology can speed up information flow, increase transparency, and enable real-time cross-border cooperation. Blockchain, for example, can track global supply chains and minimize corruption in the provision of foreign aid. However, digital transformation brings new concerns, including the digital gap between the Global North and South, cybersecurity risks, and possible data misuse. Future governance must consequently incorporate global legal frameworks for artificial intelligence, data privacy, and digital consumer protection (Floridi, 2018). Initiatives like the UN Secretary-General's proposed Global Digital Compact point to a new age of digital governance. If effective, this concept might serve as a foundation for global government in the twenty-first century.

Shifting Power Dynamics: Multipolarity and South-South Cooperation

The transition from a unipolar world dominated by the United States to a multipolar order will also have an impact on global governance. China, India, Brazil, and other nations from the Global South are exerting greater influence over global agendas. BRICS, for example, acts not only as an economic coordination forum, but also as a platform for the establishment of new institutions such as the NDB and common liquidity reserve. This shows that poor nations are no longer just policy beneficiaries, but also norm-makers in global governance (Patrick, 2014). South-South Cooperation is gaining prominence in infrastructure development, technological transfer, and humanitarian aid. If this tendency continues, future global government will be more diverse, but perhaps more fractured.

Emerging Paradigms of Multilateralism

Finally, the future of global governance may be defined by new, layered multilateral paradigms. Minilateralism, or collaboration among small groupings of nations with common goals, is gaining popularity, as seen by the Indo-Pacific Quad and Germany's planned Climate Club. Issue-based coalitions are also emerging, building adaptable alliances to address specific concerns such as global vaccination partnerships or green finance coalitions. Networked governance, which involves collaboration between nations, international organizations, the commercial sector, and civil society, is also growing. These paradigms imply that future multilateralism will be adaptable, flexible, and capable of embracing the complexities of modern global governance, rather than universal in the post-1945 sense.

Table 5. Future Prospects for Global Governance

Prospect	Description	Key Mechanisms	Opportunities & Risks
Reforming Multilateral Institutions	Adapting traditional institutions (UN, IMF, World Bank, WTO, WHO) to contemporary realities.	Quota/voting reforms, strengthening dispute settlement, pandemic treaty, institutional mandates	**Opportunities:** Restored legitimacy and trust, enhanced effectiveness. **Risks:** Resistance from powerful states, fragmented alternatives like AIIB/NDB.
Rise of Non-State Actors	Increasing influence of corporations, NGOs, philanthropic foundations, and city networks in governance.	Polycentric governance, hybrid collaboration, civil society advocacy	**Opportunities:** Innovation, rapid response, decentralized authority. **Risks:** Coordination challenges, accountability gaps.
Digital Governance & Technological Transformation	Leveraging AI, blockchain, and digital platforms to improve transparency and coordination.	Real-time monitoring, digital platforms for aid, global AI/data frameworks	**Opportunities:** Efficient information sharing, corruption reduction, improved global oversight. **Risks:** Digital divide, cybersecurity threats, data misuse.
Shifting Power Dynamics: Multipolarity & South-South Cooperation	Transition from unipolar to multipolar order, increasing Global South influence.	BRICS-led institutions, South-South partnerships, joint infrastructure and technology initiatives	**Opportunities:** Inclusive norm-setting, diversified leadership. **Risks:** Potential policy fragmentation, geopolitical competition.
Emerging Paradigms of Multilateralism	Flexible, issue-based, and networked forms of cooperation replacing universal post-1945 multilateralism.	Minilateralism, issue-based coalitions, networked governance	**Opportunities:** Adaptivity, problem-specific solutions, broader actor engagement. **Risks:** Limited universality, uneven participation, coordination complexity.

Source: Author's processed results (2025).

CONCLUSION

Global crises, ranging from the 2008 financial crisis and the COVID-19 pandemic to the contemporary climate catastrophe, have shown the international system's fragility while emphasizing the importance of global governance. Previous chapters have shown that international institutions such as the WHO, G20, and the Paris Agreement play critical roles in cross-border cooperation to solve health, financial, and environmental issues. While outcomes vary, efficacy is mostly determined by political legitimacy, technical competence, and state-interest alignment. International Political Economy (IPE) theoretical perspectives offer complementary lenses for understanding these dynamics: realism emphasizes the influence of major powers, liberalism emphasizes the importance of institutions in mitigating uncertainty, constructivism emphasizes the role of norms and ideas, and global governance theory emphasizes actor complexity and multi-level interactions.

Crisises frequently spur institutional innovation, as seen by the Bretton Woods institutions established after the Great Depression, the development of the G7 following the 1970s energy crises, and IMF reforms following the 1997 Asian financial crisis. Contemporary case studies indicate distinct institutional strengths and limitations: WHO's budget restrictions during a pandemic, the G20's short-term stabilizing capabilities, and the Paris Agreement's hybrid governance model demonstrate the breadth of institutional responses. Key issues remain, including legitimacy, accountability, power imbalance, governance fragmentation, and the development of populism and nationalism, which reflect not just institutional flaws but also wider global political processes. Looking ahead, the changing role of non-state actors, digital technology, and shifting geopolitical power indicate that global governance is becoming more adaptable, polycentric, and layered.

Since no single framework is able to adequately describe the dynamics of global governance, this study theoretically emphasizes the necessity of multidisciplinary methods within IPE. A comprehensive understanding of crisis solutions can be achieved by combining the partial insights offered by constructivism, liberalism, realism, and global governance theory.

The idea of polycentric governance has become more pertinent as non-state actors challenge the conventional state-centered paradigm by interacting more and more with states, international organizations, multinational businesses, city networks, and civil society to shape global policy.

Practically speaking, various issues arise. Reforming representation within multilateral organizations is critical for maintaining legitimacy, particularly for the IMF, World Bank, and WTO, and preventing delegitimization and the development of alternative frameworks by poor nations. To maintain public confidence, accountability must be strengthened via independent reviews, open decision-making, and civic involvement. Coordination among regimes can help to reduce fragmentation, while international public diplomacy is required to combat populism and nationalism by emphasizing the practical benefits of multilateralism.

The path of 21st-century global governance will most likely depend on negotiating multipolarity, digitalization, environmental issues, and non-state actors' growing impact.

Effective management of these changes might result in a more inclusive, adaptable, and capable governance structure, whereas failure may exacerbate fragmentation and uncertainty. To summarize, global governance is not in constant crisis, but rather changing. The obstacles are tremendous, but the potential for change and innovation are equally great, necessitating international players to create institutions that balance efficacy, legitimacy, and equity.

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CHAPTER 6
CRISIS AS A CATALYST: THE DUAL ROLE OF DIGITAL TECHNOLOGY IN MITIGATING SHOCKS AND AMPLIFYING INEQUALITIES IN SUB-SAHARAN AFRICA

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INTRODUCTION

Sub-Saharan Africa (SSA) is a region perennially characterised by its resilience in the face of multifaceted crises. From economic volatility and political instability to severe health pandemics and climate-induced shocks, these crises have historically exposed and exacerbated systemic vulnerabilities. However, the 21st century has introduced a new variable into this complex equation: rapid digitalization (Achieng & Malatji, 2022). The confluence of widespread mobile phone adoption, innovative digital platforms, and a burgeoning tech-savvy youth population has begun to reshape how societies and economies in SSA anticipate, respond to, and recover from shocks (Langthaler & Bazafkan, 2022). The COVID-19 pandemic served as a potent catalyst, accelerating digital adoption at an unprecedented pace and forcing a re-evaluation of the role of the digital economy not merely as a sector of growth but as a critical shock absorber and a foundation for future resilience (Arthur *et al*., 2022). This chapter posits that crises, while devastating, have functioned as paradoxical accelerants for technological innovation and digital economic transformation across SSA, creating new pathways for development while simultaneously revealing deep-seated structural inequalities.

This analysis focuses on the interplay between periods of acute crisis and the evolution of the digital economy in Sub-Saharan Africa from the early 2000s to the present. It examines a range of crises, including health pandemics (Ebola, COVID-19), economic recessions, and climatic shocks, to identify patterns of technological adaptation. The chapter delves into specific technological domains—mobile money, e-commerce, e-government, and digital education—to provide a granular understanding of these shifts. While celebrating innovation, it critically assesses the barriers to inclusive digitalization, such as infrastructure gaps, gender disparities, and policy fragmentation. Finally, it projects the long-term implications of these crisis-induced changes for entrepreneurship, financial systems, and regional policy, charting a course towards a more resilient and inclusive digital future.

The chapter is structured to first establish the context of crises in SSA, then illustrate the digital economy's role as a shock absorber.

It subsequently details specific technological shifts across key sectors, followed by a critical examination of the barriers these shifts encounter. The analysis then projects long-term implications and concludes with policy-oriented future directions.

1. CRISIS CONTEXTS IN SUB-SAHARAN AFRICA

Understanding the nature of crises in SSA is essential to appreciating the transformative role of technology. These are rarely isolated events but are often interconnected, creating compound shocks that strain traditional systems.

Economic Crises and Recessions

SSA's economies are often vulnerable to global commodity price fluctuations, relying heavily on the export of raw materials. Periods of low prices for oil, minerals, and agricultural products can trigger fiscal deficits, currency devaluation, and recessions (Ndubuisi, 2022). For instance, the commodity price crash of 2014-2016 led to significant economic slowdowns across the region, increasing unemployment and reducing government revenues for essential services (Disse & Sommer, 2020). Such economic contractions heighten poverty and limit formal employment opportunities, often pushing populations towards the informal sector and necessitating more resilient, low-cost economic tools.

Health Crises: HIV/AIDS, Ebola, and COVID-19

Health crises have repeatedly tested the region's public health infrastructure. The HIV/AIDS pandemic had a devastating socio-economic impact, reducing labour forces and overwhelming health systems. The 2014-2016 West Africa Ebola outbreak provided a stark precursor to COVID-19, demonstrating how health crises can halt economic activity, particularly in trade, tourism, and services. Crucially, the Ebola outbreak saw some of the earliest uses of mobile technology for contact tracing, cash transfers to quarantined families, and public health messaging (Fambeu & Tchawa Yomi, 2025).

However, it was the COVID-19 pandemic that became a continent-wide and global test, prompting lockdowns, social distancing, and the collapse of face-to-face economic interactions on an unprecedented scale. This created an immediate and urgent demand for digital alternatives.

Political Instability and Conflict

Armed conflict and political instability remain persistent in several SSA nations, disrupting livelihoods, destroying infrastructure, and creating forced displacement (Kuteyi & Winkler, 2022). In these contexts, traditional banking systems often collapse, and physical movement is restricted. Digital technologies, particularly mobile money, have become lifelines, enabling humanitarian aid delivery through digital cash transfers and allowing displaced populations to receive remittances from relatives abroad safely and efficiently (African Union Commission, 2021; Jellason *et al*., 2021). In Somalia, for instance, the mobile money system *Zaad* became a critical economic stabilizer amidst ongoing conflict and the absence of a formal banking sector.

Climate Shocks and Environmental Disruptions

SSA is disproportionately affected by climate change, experiencing increasingly frequent and severe droughts, floods, and erratic weather patterns. These events devastate agriculture, the primary livelihood for a majority of the population, leading to food insecurity and loss of income (Bryceson, 2019). Digital solutions are emerging as key tools for adaptive resilience. For example, mobile-based agricultural advisory services (e.g., iCow in Kenya) deliver weather forecasts and farming tips to help farmers adapt. Index-based agricultural insurance, paid out via mobile money upon the trigger of a predefined weather index, provides a critical safety net for vulnerable farming communities (Choi *et al*., 2020; Gatare, 2024).

Cross-Cutting Impacts on Social and Economic Systems

These crises share common consequences: they disrupt supply chains, limit physical mobility, reduce incomes, and strain government capacity. They reveal the fragility of physical, paper-based systems for delivering finance, education, healthcare, and social protection.

It is precisely these points of failure that digital technologies have begun to address, creating a compelling narrative of "leapfrogging"—where SSA bypasses older, inefficient technologies in favour of cutting-edge digital solutions (Maino *et al*., 2019).

2. RESEARCH METHODOLOGICAL APPROACH

This study employs a qualitative descriptive approach grounded in a comprehensive and systematic review of existing literature and secondary data. The methodology is designed to synthesize evidence from a wide range of sources to build a coherent, evidence-based argument about the role of digital technologies during crises in Sub-Saharan Africa (SSA). It does not involve the collection of new primary data but rather critically analyzes and integrates findings from previously published work. The specific methodological components are as follows:

Research Design: Systematic Literature Review (SLR)

The core design is a systematic literature review, which follows a structured process to identify, evaluate, and synthesize all relevant high-quality research on a specific topic. The process adhered to the following stages:

- *Problem Formulation:* Defining the research question: *How have technological shifts and the digital economy functioned as a shock absorber during crisis periods in Sub-Saharan Africa, and what are the long-term implications?*
- *Literature Search:* Conducting a thorough search for relevant literature using online academic databases (e.g., Google Scholar, JSTOR, Scopus, World Bank eLibrary, IMF eLibrary) and institutional repositories.
- *Screening and Selection:* Applying inclusion and exclusion criteria to identify the most pertinent studies. Sources were selected based on their relevance to SSA, focus on crisis periods (2014-present, with emphasis on COVID-19), and direct connection to digital technologies.
- *Data Analysis and Synthesis:* Thematically analyzing and synthesizing the findings from the selected literature to identify patterns, relationships, and overarching themes, such as the acceleration of mobile money, the exposed of the digital divide, and policy responses.

Data Sources and Collection

The analysis draws upon a multidisciplinary evidence base from four primary source categories:

- *Academic Research:* Peer-reviewed journal articles from fields including economics, development studies, information and communication technologies for development (ICT4D), political science, and public health. These provide empirical findings, theoretical frameworks, and critical analyses.
- *Reports from International Organizations and Think Tanks:* Comprehensive reports and datasets from institutions such as:

The World Bank: Data on financial inclusion (Global Findex), poverty, and digital development.

The International Monetary Fund (IMF): Regional economic outlooks and analyses of fiscal policy during crises.

*The International Telecommunication Union (ITU)***:** Data on ICT infrastructure, access, and affordability.

GSMA: Industry data on mobile penetration, mobile money adoption, and trends across Africa.

African Development Bank (AfDB) and UN Economic Commission for Africa (UNECA): Reports on regional integration, policy, and development challenges.

- *National Government and Central Bank Publications:* Policy documents, national digital strategies, press releases, and statistical reports from central banks (e.g., Central Bank of Kenya, National Bureau of Statistics Nigeria) that provide official data on mobile money transactions, e-commerce growth, and regulatory changes.
- *Reputable News and Analysis Outlets:* Articles from credible sources like *Reuters*, *The Economist*, and *BBC* that documented real-time developments and case studies during acute crises, such as the implementation of Togo's NOVISSI program.

Data Analysis Techniques

The collected data was analyzed using **thematic analysis**. This involved: *Familiarization;* immersing in the data by reading and re-reading the selected sources. *Generating Initial Codes;* identifying key phrases, concepts, and ideas relevant to the research question. *Searching for Themes;* collating codes into potential overarching themes that structure the analysis (e.g., "Mobile Money as a Shock Absorber," "The Digital Divide," "Policy Responses"). *Reviewing and Defining Themes;* refining the themes to ensure they accurately represent the dataset and constructing a coherent narrative around them. This thematic structure is directly reflected in the provided Table of Contents.

Comparative Case Study Analysis: within the broader themes, specific country cases (e.g., Kenya's M-Pesa, Rwanda's e-government, Togo's NOVISSI) were analyzed in depth to provide concrete examples and draw out nuances in how different national contexts shaped digital crisis responses.

Methodological Limitations

While robust, this methodology has inherent limitations: *Reliance on Secondary Data;* the analysis is dependent on the availability, accuracy, and biases of previously published work. It cannot fill gaps where primary data is missing. *Generalizability:* sub-Saharan Africa is highly diverse. Findings from prominent tech hubs like Kenya or Rwanda may not be fully generalizable to all countries in the region, particularly those with weaker state capacity or digital infrastructure. *Temporal Bias:* the overwhelming focus on the COVID-19 pandemic in recent literature may overshadow lessons from earlier crises, though efforts were made to include them. *Lack of Primary Investigation;* the methodology does not capture ground-level, qualitative experiences and perceptions of individuals and small businesses, which could be explored through future primary research involving surveys or interviews.

In conclusion, this methodology provides a rigorous, evidence-based foundation for analyzing a complex and rapidly evolving phenomenon. By synthesizing insights from a wide array of authoritative sources, it offers a comprehensive overview of how digital technologies are reshaping crisis response and economic resilience in Sub-Saharan Africa.

3. THE DIGITAL ECONOMY AS A SHOCK ABSORBER

During crises, the digital economy transitions from a sector of potential growth to an essential utility, cushioning the impact of shocks and enabling continuity.

The digital economy in SSA is broad but can be defined as economic and social activities enabled by digital technologies, primarily internet and mobile platforms. It encompasses core ICT sectors, digital financial services, platform-based work (e-commerce, ride-hailing), and the digitalization of traditional sectors like agriculture (AgriTech) and health (HealthTech) (Awuni, 2024). Its defining characteristic in SSA is its mobile-centric nature; for many, a smartphone or feature phone is the primary, if not sole, point of access to the internet and digital tools (Gross, 2019).

Information and Communication Technology (ICT) mitigates shocks by enabling economic activity to continue remotely. When physical marketplaces closed during COVID-19 lockdowns, digital platforms allowed merchants to maintain customer relationships and sales. Mobile money enabled the continuation of payments and transactions without physical cash, which was feared as a vector for virus transmission. A study from Kenya found that households with access to mobile money were better able to maintain consumption levels during a period of economic hardship compared to those without (Nyagadza *et al*., 2022).

Perhaps the most direct function of the digital economy as a shock absorber is its role in delivering social safety nets. Governments and NGOs increasingly leverage digital payment systems for Conditional and Unconditional Cash Transfers (CCTs/UCTs). During COVID-19, countries like Togo pioneered novel approaches. Its NOVISSI program used satellite data and mobile money to digitally distribute emergency cash aid to informal workers in poorest communities, dramatically reducing the time, cost, and corruption risks associated with physical cash distribution (Copinschi, 2022). This model demonstrated how digital ID, mobile money, and data analytics can be combined to create efficient and targeted social protection systems in times of crisis.

There are ***case examples of digital resilience in crisis:***

- **Ebola in West Africa:** Mobile money was used by organizations like the Red Cross to deliver hazard pay to health workers and provide funds to quarantined families, reducing the need for physical contact.
- **COVID-19 Pandemic Across SSA:** This was the region's largest digital stress test. Beyond cash transfers, technology was used for:
- *Health Communication:* SMS and USSD campaigns for public health information.
- *Telemedicine:* Platforms like *mPharma* in Ghana and *Babyl* in Rwanda saw surges in usage, providing remote medical consultations.
- *E-commerce:* Platforms like *Jumia* (pan-African) and *Sokowatch* (in East Africa) became essential for accessing goods during lockdowns.

Technological Shifts During Crises

Crises act as forcing functions, breaking down resistance to change and accelerating the adoption of specific technologies.

Evolution of Mobile Money in SSA: Mobile money, the brainchild of Safaricom's M-Pesa launched in Kenya in 2007, has been SSA's most celebrated digital innovation. It allowed users to store and transfer value using their mobile phones, leapfrogging the need for traditional bank accounts. Its growth was initially steady, driven by the need for efficient person-to-person (P2P) transfers and bill payments. By 2019, SSA was the global leader in mobile money, accounting for nearly half of all live mobile money services (Karacuka *et al*., 2025).

Mobile Money during COVID-19: The pandemic supercharged this ecosystem. Fear of viral transmission through physical banknotes prompted governments and central banks to actively encourage digital payments. Many regulators, such as the Bank of Ghana and the Central Bank of Nigeria, temporarily increased transaction limits and waived fees for mobile money transactions to facilitate their use. This led to a massive surge in volumes and values. In Kenya, the value of mobile money transactions grew by over 40% in the first months of the pandemic (Edo *et al*., 2019). It became the primary channel for governments to disburse emergency funds, for businesses to pay employees working remotely, and for citizens to pay for utilities and goods.

Financial Inclusion and Poverty Reduction: The crisis-driven adoption of mobile money has profound long-term implications for financial inclusion (Shahbaz *et al*., 2019). The World Bank's Global Findex database shows that SSA has made significant strides, with account ownership rising from 34% in 2014 to 55% in 2021, largely driven by mobile money (Salimi, 2025). This access to financial tools helps poor households manage cash flow, smooth consumption during shocks, and build savings, effectively acting a buffer against poverty.

E-commerce and Informal Trade

Growth of Regional E-commerce Platforms: The lockdowns imposed during the COVID-19 pandemic forced a behavioural shift among consumers and merchants alike. Pan-African e-commerce giant *Jumia* reported significant increases in new customers and order volumes. More importantly, it spurred the growth of hyper-local solutions. Platforms like *Kasha* (Rwanda, Kenya), which focuses on women's health and personal goods, and *Tospa* (Nigeria), which connects farmers directly to buyers, gained traction by solving specific, crisis-induced supply chain disruptions.

Social Media and Informal Digital Trade: Formal platforms tell only part of the story. A much larger shift occurred within the vast informal sector, which constitutes over 80% of employment in SSA (Gaus & Hoxtell, 2019). Small merchants and artisans rapidly pivoted to using social media platforms like WhatsApp, Facebook, and Instagram as de facto storefronts. WhatsApp groups became digital marketplaces where goods were showcased, orders were placed, and payments were made via mobile money. This "informal e-commerce" demonstrated remarkable agility and became a critical survival mechanism for millions of micro-enterprises.

Barriers to E-commerce Expansion: Despite this growth, significant barriers persist. These include low trust in online payments beyond peer-to-peer, logistical challenges in last-mile delivery especially outside urban centres, and the high cost of data. Furthermore, the digital literacy required to navigate formal e-commerce platforms remains a hurdle for many in the informal sector, who often prefer the familiarity of social media apps.

E-government and Digital Services

Crisis-driven Expansion of E-government Tools: Crises expose the inefficiencies of bureaucratic, paper-based government systems. The need for rapid and contactless service delivery during COVID-19 accelerated the digitization of public services. Governments rolled out or scaled up online portals for business registration, tax filing, and applying for licenses and permits, ensuring regulatory functions could continue during lockdowns.

Digital IDs, Health Records, and Social Protection Systems: The foundation of efficient e-government is digital identification (ALshubiri *et al*., 2023). Countries with robust digital ID systems, such as Kenya (*Huduma Namba*) and Nigeria (*NIN*), were better positioned to quickly roll out targeted support programs. Rwanda's investment in digital health records facilitated its effective pandemic response. *Rwanda's* use of drones to deliver medical supplies and blood and its implementation of digital health passes are examples of how pre-crisis digital investments paid off during the emergency (Hiran & Henten, 2020).

There are regional case studies: *Rwanda;* often termed the "Singapore of Africa," Rwanda's national digital transformation strategy, launched well before COVID-19, allowed it to pivot swiftly. Its *Irembo* platform became a one-stop-shop for over 100 government services. *Kenya;* building on its *M-Pesa* success, Kenya's e-citizen platform integrated digital payments for all government services, reducing corruption and increasing efficiency. *Nigeria;* the pandemic accelerated the rollout of its National Identity Number (NIN) and its linkage to SIM cards, aiming to create a verifiable digital identity for all citizens to improve service delivery.

Remote Work and Education

Transition to Digital Workspaces: For the formal sector and tech-enabled businesses, the pandemic necessitated an abrupt shift to remote work (Brun *et al*., 2019; Mare *et al*., 2019). Companies adopted tools like Zoom, Microsoft Teams, and Slack. While this was feasible for a small segment of the workforce, it highlighted the digital divide between large corporations and small businesses, and between high-skill and low-skill workers.

E-learning Platforms during COVID-19: Perhaps the most challenging shift was in education. Nationwide school closures affected millions of students. Governments and educational institutions attempted to ensure learning continuity through a mix of online classes, educational TV and radio broadcasts, and offline digital content. Platforms like Kenya's *Elimu* (by eKitabu) and Nigeria's *Pass.ng* saw increased usage. Universities attempted to transition to Learning Management Systems (LMS).

Unequal Access to Digital Education: This area most starkly revealed the digital divide. The shift to e-learning presupposed access to a reliable device, affordable internet, and a conducive learning environment at home—assumptions that failed for the vast majority. A UNICEF report estimated that over 80% of children in SSA lacked any form of access to digital or distance learning during peak school closures (Mashamba & Gani, 2023). The crisis risked exacerbating existing educational inequalities along urban-rural and socio-economic lines.

4. STRUCTURAL BARRIERS AND INEQUALITIES

The rapid digital acceleration during crises has not been uniformly experienced. It has often mirrored and sometimes intensified pre-existing social and economic inequalities. The bedrock of the digital economy is infrastructure—reliable electricity, mobile networks, and broadband internet (Zhou *et al*., 2022). Large swathes of SSA, particularly rural areas, suffer from inadequate coverage. While 4G coverage now reaches over 70% of the SSA population, a significant gap remains, and network quality and reliability are often inconsistent (Menza *et al*., 2024). Without this basic infrastructure, digital tools remain inaccessible. Even where coverage exists, cost is a prohibitive barrier. Despite recent improvements, data costs in SSA remain high relative to average incomes. The Alliance for Affordable Internet (A4AI) reports that the cost of 1GB of mobile data in many SSA countries is still above the UN-affordable threshold of 2% of monthly income (Mader *et al*., 2021). This "affordability gap" excludes low-income populations from fully participating in the digital economy.

A persistent gender digital divide exists across SSA. Women are 20% less likely than men to own a smartphone and 37% less likely to use mobile internet (Mader *et al*., 2022). This gap is driven by a complex mix of factors: lower incomes, lower literacy levels, social norms that prioritize male access to technology, and safety concerns online. This means women have less access to crisis-mitigating digital tools like mobile money, health information, and e-government services, deepening economic and social disparities during shocks. The digital economy is overwhelmingly urban. Rural areas face the triple jeopardy of weaker network coverage, higher poverty rates, and lower levels of digital literacy. This creates a geographical inequality where rural populations, who are often most dependent on climate-vulnerable agriculture and most in need of safety nets, are the least able to access digital shock absorbers (Boukherouaa *et al*., 2021). The digital economy is often hindered by outdated or contradictory regulations. Fragmented policies across different countries stifle the growth of regional digital markets (Asongu *et al*., 2019). For instance, a patchwork of data protection and privacy laws creates uncertainty for businesses operating across borders. Similarly, restrictive regulations can inhibit innovation; for years, many countries resisted granting non-bank entities (like mobile network operators) the licenses needed to offer full financial services, slowing the growth of mobile money.

5. LONG-TERM IMPLICATIONS OF CRISIS-INDUCED SHIFTS

The behavioral and institutional changes catalysed by crises are likely to have enduring effects on the structure of SSA's economies.

Institutionalization of Digital Finance

The crisis-driven surge in mobile money is evolving beyond simple P2P transfers. Digital financial ecosystems are expanding to include savings products, micro-credit (e.g., M-Pesa's *Fuliza* overdraft service), insurance (e.g., index-based crop insurance), and even micro-investment options (Pantserev, 2022). This "institutionalization" means digital finance is becoming a deeply embedded part of the broader financial system.

Traditional banks, initially threatened by mobile money, are now increasingly partnering with Fintech companies and Mobile Network Operators (MNOs) through APIs (Application Programming Interfaces). This collaboration is creating a more integrated financial landscape where traditional banking services are delivered through digital channels, broadening their reach.

This reliance introduces new risks. Cybersecurity threats and digital fraud are growing concerns. Furthermore, system outages or technical failures in a highly digitalized economy could have catastrophic effects. There is also a risk of exacerbating exclusion for those unable to access digital tools, and of new forms of debt arising from easily accessible digital credit.

Innovation and Entrepreneurship

Crises create new market demands and attract investment into sectors that provide solutions. Venture capital funding for African tech startups has soared, with Fintech leading the way, followed by HealthTech and AgriTech (Partech Africa, 2022). The pandemic demonstrated the viability and necessity of these solutions, attracting both local and international investors.

There are case studies: *Lagos, Nigeria;* a magnet for Fintech innovation, home to companies like *Flutterwave* (payments) and *Paystack* (acquired by Stripe). *Nairobi, Kenya;* "Silicon Savannah" is a hub for diverse innovations, from *M-Kopa* (pay-as-you-go solar energy) to *Twiga Foods* (a B2B food supply chain platform). *Kigali, Rwanda;* government support has positioned Kigali as a centre for emerging technologies, attracting investments in drone technology (Zipline) and smart city solutions.

Crises force entrepreneurs to identify and solve acute problems with limited resources, fostering a culture of agile innovation. The constraints imposed by COVID-19 lockdowns, for example, led to a surge in new business registrations in the digital space across many African countries as people sought alternative livelihoods.

Policy and Regional Integration

The demonstrated power of digital tools during crises has moved digital transformation to the top of the policy agenda. Most SSA countries now have or are developing national digital strategies focused on expanding infrastructure, promoting digital skills, and creating enabling regulatory environments. These strategies are increasingly viewed as essential for national economic resilience, not just growth.

The implementation of the AfCFTA presents a monumental opportunity. A key focus is on creating a Digital Trade Protocol to harmonize regulations on e-commerce, data protection, and digital payments across the continent. If successfully implemented, this could create a seamless pan-African digital market, allowing startups to scale from day one, fostering competition, and driving down costs for consumers (UNECA, 2020).

Crises have underscored the need for regional cooperation. Harmonized regulations on data privacy, cybersecurity, and digital taxation can reduce uncertainty for investors and operators, facilitate cross-border data flows, and enable the scaling of digital public goods (e.g., regional payment systems). Bodies like the Smart Africa Alliance are spearheading these efforts.

6. FUTURE DIRECTIONS

To harness the full potential of crisis-induced digital shifts and build a resilient and inclusive digital economy, concerted action is needed on several fronts. Massive public and private investment is required to close infrastructure gaps. This includes not only expanding 4G and deploying 5G networks but also investing in national and regional fibre optic backbones and internet exchange points (IXPs) to lower data costs and improve quality. Innovative solutions like satellite internet (e.g., Starlink) also hold promise for reaching the most remote areas. Policies must be deliberately designed to promote inclusion. This includes:

- **Gender-Responsive Policies:** Initiatives targeting women's digital literacy, affordability of devices, and online safety.
- **Rural Connectivity Programs:** Subsidies and public-private partnerships to expand network coverage to underserved areas.

- **Device Affordability:** Reducing taxes on smartphones and low-cost devices to broaden access.

Digital skills are the new literacy. Educational curricula at all levels need to integrate digital skills training.

Furthermore, large-scale upskilling and reskilling programs are needed for the current workforce to thrive in an increasingly digital economy, particularly in areas like coding, data analysis, and digital marketing. As economies digitize, they become more vulnerable. Governments must urgently strengthen national cybersecurity frameworks and establish robust, independent data protection authorities to enforce privacy laws (like Nigeria's NDPA). Building trust is essential for continued digital adoption. The lessons from COVID-19 and other crises should be institutionalized. Governments should invest in **digital public infrastructure (DPI)**—interoperable digital systems like ID, payments, and data exchange—as a national priority. This infrastructure, built to open standards, can then be leveraged by both the public and private sectors to innovate and deliver services efficiently, especially during future crises.

CONCLUSION AND RECOMMENDATIONS

This analysis has demonstrated that periods of profound crisis in Sub-Saharan Africa, while causing immense hardship, have functioned as powerful accelerants for technological adoption and digital economic transformation. The digital economy, particularly mobile money, e-commerce, and e-government, has proven to be a critical shock absorber, enabling the continuity of economic activity, the delivery of social safety nets, and the provision of essential services when physical systems failed. The COVID-19 pandemic was a particularly potent catalyst, compressing years of anticipated digital adoption into a few months.

Crises have a dual character. They are moments of immense **disruption** that lay bare systemic vulnerabilities and inequalities, particularly the digital divides based on gender, geography, and income. Yet, they are also moments of forced **transformation**, breaking down institutional inertia and cultural resistance to change.

They create a compelling "burning platform" that motivates governments, businesses, and individuals to adopt new technologies and behaviours at a scale previously thought impossible.

The trajectory of SSA's digital transformation is promising but not predetermined. The gains made during crises are fragile and can be lost if not consolidated. The path forward requires a deliberate and collaborative effort. Governments must prioritize investments in digital infrastructure and skills, while enacting smart, enabling regulations that foster innovation and protect citizens. The private sector must continue to drive innovation while developing inclusive business models. International partners should align their support with national digital strategies. By learning from the lessons of past crises and proactively addressing the barriers of access and inequality, Sub-Saharan Africa can harness its digital potential to build more resilient, inclusive, and dynamic economies for the future.

The analysis of technological shifts during crises reveals both immense opportunity and significant risk. To harness the digital economy's potential as a force for resilience and inclusive growth, rather than a source of further inequality, policymakers, private sector actors, and international partners must adopt a coordinated and strategic approach. The following recommendations are targeted at national governments, regional bodies, and their development partners.

1. For National Governments:

a) Prioritize Digital Public Infrastructure (DPI) as a National Asset:

- Implication: Crises have proven that interoperable digital systems are as critical as physical infrastructure like roads and ports.
- Recommendation: Governments should invest in and treat foundational DPI—including digital identity (e.g., functional digital ID systems), digital payments (e.g., fast payment systems), and data exchange platforms—as public goods. These systems should be designed with open standards and APIs to allow both public and private sectors to innovate on top of them, ensuring efficiency and scalability during emergencies.

b) Implement Pro-Poor and Inclusive Digital Policies:

- Implication: Market forces alone will not bridge the digital divide; deliberate policy is required.
- Recommendation:
  - Device Affordability: Reduce or eliminate taxes on low-cost smartphones and internet-enabled devices.
  - Gender-Responsive Policies: Develop national digital inclusion strategies that specifically target women, addressing barriers like cost, digital literacy, and online safety through targeted training programs and awareness campaigns.
  - Rural Connectivity: Use Universal Service and Access Funds (USAFs) effectively to subsidize network expansion into underserved rural areas through public-private partnerships.

c) Develop Adaptive and Agile Regulatory Frameworks:

- Implication: The rapid pace of digital innovation often outstrips existing regulations, creating uncertainty or stifling growth.
- Recommendation: Establish "test-and-learn" regulatory sandboxes, particularly for FinTech and HealthTech, allowing innovators to test new products in a controlled environment under regulatory supervision. This balances the need for consumer protection with the encouragement of innovation. Regulations should be principles-based and technology-neutral to remain relevant as technologies evolve.

d) Integrate Digital Literacy into National Education Curricula:

- Implication: Access to technology is meaningless without the skills to use it effectively and safely.
- Recommendation: Mandate digital literacy from primary school levels and integrate it into adult education and vocational training programs. This should go beyond basic computer skills to include critical thinking, online safety, privacy protection, and digital citizenship.

e) Mainstream Cybersecurity and Data Protection:

- Implication: Increased digitalization creates larger attack surfaces for cyber threats and risks of personal data misuse.

- Recommendation: Expedite the full implementation and enforcement of comprehensive data protection laws (e.g., Nigeria's NDPA). Establish national Computer Security Incident Response Teams (CSIRTs) and invest in building national cybersecurity capacity.

2. For Regional Bodies (e.g., AU, AfCFTA Secretariat, RECs):

a) Harmonize Regulations to Create a Seamless Digital Market:

- Implication: Fragmented national regulations hinder the growth of pan-African digital companies and economies of scale.
- Recommendation: Prioritize the ratification and implementation of the AfCFTA Protocol on Digital Trade. Lead efforts to harmonize key areas such as:
  - Data Governance: Cross-border data flow rules based on best practices for privacy and security.
  - Digital Payments: Interoperable regional payment systems to lower transaction costs.
  - E-commerce Regulations: Harmonized consumer protection, cybercrime, and contract laws.

b) Facilitate Regional Infrastructure Projects:

- Implication: Internet traffic between African countries often routes through other continents, increasing latency and cost.
- Recommendation: Promote and fund regional broadband infrastructure projects and support the establishment of more Internet Exchange Points (IXPs) to keep local traffic local, reducing data costs and improving speeds for everyone.

c) Promote Knowledge Sharing and Best Practices:

- Implication: Countries are at different stages of their digital transformation journeys.
- Recommendation: Regional bodies should create formal platforms for sharing best practices and lessons learned on digital ID implementation, digital social registry design, and Fintech regulation, allowing lagging countries to learn from leaders like Kenya, Rwanda, and Ghana.

3. For the Private Sector and Investors:

a) Invest in Inclusive Business Models:

- Implication: The vast informal sector and low-income populations represent a major untapped market.
- Recommendation: Develop and scale innovative, low-cost business models that serve the base of the pyramid. This includes offering sachet-sized (micro) products for insurance, credit, and data, and developing solutions that work on basic feature phones and low-bandwidth environments.

b) Partner with Governments on Infrastructure and Skills:

- Implication: Long-term commercial success is tied to a healthy and skilled digital ecosystem.
- Recommendation: Mobile Network Operators (MNOs) and tech companies should actively partner with governments through USAFs to expand network coverage. Furthermore, private sector-led digital skills training and internship programs can help build the talent pipeline needed for future growth.

4. For International Development Partners:

a) Align Funding with National Digital Strategies:

- Implication: Support is most effective when it reinforces a country's own priorities.
- Recommendation: Move beyond funding isolated pilot projects. Provide budget support and long-term investment aligned with national digital transformation strategies, focusing on building foundational DPI and digital capacity within governments.

b) Finance High-Risk Digital Infrastructure Projects:

- Implication: Private capital may be hesitant to invest in high-risk, long-gestation infrastructure projects in rural areas.
- Recommendation: Development Finance Institutions (DFIs) should use concessional financing, guarantees, and blended finance models to de-risk and attract private investment into last-mile connectivity and renewable energy infrastructure for digital access.

The policy implications are clear: digitalization is no longer a standalone sector but a transversal enabler of resilience, economic growth, and social inclusion. The lessons from recent crises provide a clear roadmap. By moving from ad-hoc crisis response to strategic, long-term investment in inclusive digital foundations, Sub-Saharan Africa can not only better withstand future shocks but also unlock sustainable and equitable development for the decades to come. This requires a whole-of-society approach, with coordinated action from governments, regional institutions, the private sector, and civil society.

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CHAPTER 7
THE IMPACT OF ECONOMIC SANCTIONS ON THE MONETARY AND FINANCIAL SECTORS: A SYSTEMATIC REVIEW WITH A FOCUS ON IRAN

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INTRODUCTION

Economic sanctions have emerged as one of the most frequently utilized tools of foreign policy in the 21st century, exerting profound impacts not only on trade but also on the monetary and financial structures of targeted countries. These sanctions, often imposed by major powers such as the United States, the European Union, or the United Nations, have grown increasingly sophisticated since the 1990s, extending beyond simple trade restrictions to include financial limitations, asset freezes, and disconnection from global payment systems like SWIFT and international banking networks (Hufbauer et al., 2007; Weber & Schneider, 2020). Such measures can trigger a cascade of adverse effects, including heightened inflation due to pressure on foreign exchange reserves, exchange rate volatility stemming from reduced foreign currency supply, diminished effectiveness of central bank monetary policies due to constrained intervention tools, and the proliferation of informal financial activities that undermine confidence in the banking system. For instance, in countries like Iran, sanctions imposed after 2018 led to inflation rates exceeding 40% and significant exchange rate fluctuations, rendering economies reliant on imported raw materials and technology particularly vulnerable (Felbermayr et al., 2020; World Bank, 2023).

These impacts are especially pronounced in emerging economies or those heavily dependent on foreign trade and natural resources (e.g., oil), where fragile financial structures can precipitate banking crises, depletion of foreign exchange reserves, and erosion of public trust in the monetary system. Research indicates that sanctions not only slow economic growth but can also induce stagflation cycles, characterized by simultaneous declines in production and rising prices, leaving policymakers with limited tools for stabilization (Hatipoglu & Peksen, 2018). Furthermore, sanctions can indirectly affect capital markets by increasing the cost of external financing and reducing foreign direct investment (FDI), ultimately undermining long-term economic growth.

Despite the significant growth in research on economic sanctions over the past two decades, the existing literature remains fragmented and heterogeneous.

Many studies focus on specific country cases, such as the impact of sanctions on Iran following the 2015 nuclear agreement and the U.S. withdrawal in 2018 (Esfahani et al., 2013), Russia after the 2014 annexation of Crimea and the 2022 invasion of Ukraine (Ankudinov et al., 2017), or Venezuela under U.S. sanctions (Afesorgbor & Mahadevan, 2016). Some research examines only macroeconomic outcomes, such as inflation, GDP growth, or income inequality, without delving deeply into specific monetary and financial indicators. Few studies comprehensively and systematically analyze the effects of sanctions on variables such as liquidity, money supply, interest rates, banking stability, and overall monetary policy performance. This research gap, particularly in the context of developing economies, underscores the need for a systematic review. Such an approach, with a transparent protocol, comprehensive search across reputable academic databases (e.g., Scopus, Web of Science, and Google Scholar), and rigorous study screening, enables the provision of a cohesive, evidence-based, and generalizable picture of sanctions' impacts. This method not only identifies common patterns (e.g., short-term exchange rate volatility) but also highlights differences arising from sanction types (trade, financial, or corporate), economic structures, and temporal periods.

This chapter, as part of a comprehensive book, aims to address this research gap by providing a systematic review of empirical evidence published between 2000 and 2024. Its primary focus is to synthesize findings from selected studies to identify common patterns (e.g., increased exchange rate volatility in the short term) and differences (e.g., the role of institutional quality in mitigating long-term effects) across countries and time periods. The chosen approach not only elucidates the direct impacts of sanctions (e.g., asset freezes) and indirect effects (e.g., heightened inflationary expectations) on monetary and financial variables but also provides practical insights for policymakers. For example, these findings can inform the design of countermeasures, such as bolstering foreign exchange reserves, developing alternative financial markets (e.g., Islamic bonds or regional financial cooperation with Asian countries), stabilization tools (e.g., controlling liquidity through open market operations), and institutional reforms (e.g., enhancing corporate governance in banks).

Ultimately, this chapter seeks to integrate empirical and theoretical evidence to offer a practical framework for understanding and managing the effects of sanctions on economies under pressure, serving as a foundation for future research and resilient policymaking.

1. THEORETICAL FOUNDATIONS

Economic sanctions, as a cornerstone of modern foreign policy, have been systematically employed since the early 20th century to exert non-military pressure on target countries, aiming to alter their political or economic behavior (Doxey, 1987). These measures, often orchestrated by major global actors such as the United States, the European Union, or multilateral organizations like the United Nations, operate as exogenous shocks that disrupt the macroeconomic equilibrium of targeted economies. By restricting access to international trade, financial markets, and critical resources, sanctions generate multifaceted impacts that ripple across markets for goods, money, and foreign exchange, ultimately reshaping economic growth trajectories (Hufbauer et al., 2007). This section establishes a theoretical framework to understand how sanctions affect monetary and financial systems, delineating the primary channels of influence and their implications for key economic variables such as exchange rates, stock markets, banking stability, and monetary policy effectiveness.

1.1 Channels of Impact

Sanctions exert their influence through several interconnected channels, each amplifying the economic pressure on the target country. These channels include trade restrictions, financial constraints, currency market disruptions, and heightened uncertainty in expectations. Their combined effects can precipitate inflationary spirals, financial instability, and reduced economic resilience, particularly in economies with structural vulnerabilities (Felbermayr et al., 2020).

Trade Channel*:* Sanctions often limit exports and imports, reducing foreign exchange inflows and disrupting supply chains for critical goods, such as raw materials and capital equipment. This leads to shortages, increased production costs, and a contraction in export-driven sectors, which can exacerbate fiscal deficits and weaken economic output (Wang et al., 2019).

***Financial Channel**:* By blocking access to global financial systems (e.g., SWIFT), freezing foreign assets, and restricting international credit lines, sanctions increase the cost of capital and hinder investment. This channel directly affects banking operations, reduces liquidity, and limits the ability of firms to finance operations, leading to a contraction in economic activity (Hatipoglu & Peksen, 2016).

***Currency Channel**:* Sanctions reduce the supply of foreign currency by curbing export revenues and restricting financial transactions, driving up exchange rates and fueling depreciation of the national currency. This depreciation triggers inflationary pressures and activates feedback loops through heightened inflationary expectations (Dornbusch, 1987). Empirical models, such as Markov-switching and structural vector autoregression (SVAR) analyses, have demonstrated that sanctions-induced exchange rate volatility is particularly pronounced in the short term, with effects moderating over time as economies adapt (Nademi et al., 2017; Mirjalili et al., 2025).
***Expectations Channel**:* Sanctions amplify economic uncertainty, increasing systemic risk and eroding investor confidence. This leads to capital flight, heightened stock market volatility, and a shift toward informal financial activities, which further destabilize the economy (Pesaran & Laudati, 2021). The expectations channel is particularly critical in amplifying short-term shocks, as it shapes market behavior and influences long-term investment decisions.

These channels are summarized in Table 1, which outlines the mechanisms and consequences of sanctions on monetary and financial systems.

Table 1: Analysis of Sanctions' Impact Channels

Channel	Mechanism of Impact	Consequences
Trade	Restrictions on exports and imports	Reduced foreign exchange earnings, disrupted supply chains
Financial	Asset freezes, SWIFT disconnection, restricted access to international credit	Increased cost of capital, reduced investment, banking sector strain
Currency	Reduced foreign currency supply, speculative demand surge	Exchange rate depreciation, widened official-market exchange rate gap
Monetary	Increased money supply due to government borrowing and central bank interventions	Rising liquidity, inflationary pressure
Expectations	Heightened uncertainty and systemic risk	Stock market volatility, capital flight, eroded public confidence

1.1 Impact on Monetary and Financial Variables

Sanctions influence a range of monetary and financial variables, each affected through distinct mechanisms: ***Exchange Rates****:* As a highly sensitive macroeconomic variable, exchange rates respond rapidly to sanctions-induced shocks. By limiting export revenues and restricting access to foreign currency, sanctions reduce currency supply, pushing exchange rates toward higher equilibria (Wang et al., 2019). This depreciation fuels inflationary expectations, activating transmission channels that amplify price pressures (Dornbusch, 1987). Studies using Markov-switching models and SVAR for countries like Iran demonstrate that sanctions trigger high-volatility exchange rate regimes, with short-term effects being more severe than long-term ones (Nademi et al., 2017). Dynamic stochastic general equilibrium (DSGE) models further indicate that sanctions induce simultaneous recession and inflation in the short term, though compensatory policies can mitigate these effects over time (Mirjalili et al., 2025).

Stock Markets*:* Stock markets, often regarded as economic barometers, are highly sensitive to sanctions. Event studies reveal that new sanctions announcements lead to significant declines in cumulative abnormal returns (CAR) and increased systematic volatility (Ankudinov et al., 2017). The response varies across industries: export-oriented sectors (e.g., metals, petrochemicals) experience sharper declines, while domestically oriented industries may occasionally benefit from reduced import competition (Pesaran & Laudati, 2021). GARCH and DCC-GARCH models confirm that sanctions not only depress stock indices but also increase inter-industry correlations and volatility spillovers, amplifying systemic risk (Brooks & Henry, 2000). ***Banking System****:* As the backbone of the financial sector, banks are particularly vulnerable to sanctions. Restrictions on international credit lines, coupled with increased loan defaults and operational costs, erode banking stability, as evidenced by declining Z-scores (Mishkin, 2010). Sanctions also limit governments' ability to intervene in liquidity crises, exacerbating financial strain (Hatipoglu & Peksen, 2016).

Bank-specific factors, such as capital adequacy, liquidity, and ownership structure (public vs. private), play a moderating role in determining vulnerability to sanctions (Bolgorian & Mayeli, 2019).

1.3 Moderating Factors

The impact of economic sanctions on monetary and financial systems is far from uniform, exhibiting significant variation across different economic contexts due to a range of moderating factors that shape the intensity, duration, and nature of these effects. These factors include the target country's economic structure, institutional quality, access to global and regional financial markets, and the availability of foreign exchange reserves, each of which plays a critical role in determining how sanctions influence key variables such as exchange rates, stock market performance, inflation, liquidity, and banking stability. For instance, economies heavily reliant on natural resource exports, such as oil-dependent countries like Iran, face amplified disruptions due to sanctions-induced reductions in foreign currency inflows, which exacerbate exchange rate volatility and fiscal deficits (Zamani et al., 2021; Rome, 2021). In contrast, economies with diversified industrial bases or robust domestic markets may experience less severe impacts, as they can pivot to internal demand or alternative trade partners (Alwadeai et al., 2024). Institutional quality, encompassing political stability, rule of law, and efficient governance, significantly mitigates sanctions' adverse effects by enabling structural reforms, such as improved corporate governance in banks or capital market development, which foster long-term resilience (Roudari et al., 2023; Khan et al., 2020). Similarly, countries with substantial foreign exchange reserves can better absorb external shocks, stabilizing exchange rates and supporting monetary policy effectiveness, as evidenced by cross-country analyses (Ray, 2012). Access to alternative financial markets, including regional partnerships or non-Western payment systems, further reduces vulnerability by providing avenues for trade and investment continuity, as seen in Iran's shift toward Asian markets post-2018 (Kokorev, 2022). These moderating factors collectively determine the extent to which sanctions disrupt economic systems and the speed of recovery, highlighting the importance of tailored policy responses to enhance adaptive capacity in sanctioned economies.

2. METHODOLOGY

This chapter employs a systematic review approach, guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, to investigate the impacts of economic sanctions on monetary and financial sectors. The PRISMA methodology ensures a structured, transparent, and reproducible process, enhancing the credibility and scientific rigor of the findings. By synthesizing empirical evidence from studies published between 2000 and 2024, the review aims to provide a comprehensive, evidence-based analysis of how sanctions affect monetary variables, such as exchange rates, liquidity, and interest rates, and financial indicators, including stock market performance and banking stability. The approach captures both global and country-specific perspectives, with a particular focus on Iran, to identify common patterns, contextual variations, and policy-relevant insights.

A comprehensive literature search was conducted across a diverse set of academic databases to ensure broad coverage of relevant studies. International databases, including Scopus, Web of Science, ScienceDirect, SpringerLink, and Google Scholar, were searched to access peer-reviewed research from a global perspective. To incorporate region-specific studies, particularly for Iran, Persian-language databases such as SID (Scientific Information Database), MagIran, and Noormags were also included. The search utilized carefully selected keywords, such as "economic sanctions," "financial sanctions," "exchange rate," "stock market," "banking stability," "monetary policy," "inflation," and "Iran," combined with Boolean operators (AND, OR) to maximize the retrieval of relevant studies. The temporal scope was restricted to 2000–2024 to focus on contemporary sanction regimes, including those targeting Iran post-2010 and Russia after 2014 and 2022, ensuring relevance to modern economic and geopolitical contexts.

The study selection process was guided by rigorous inclusion and exclusion criteria to ensure focus and quality. Included studies were peer-reviewed, employed quantitative empirical methods (e.g., ARDL, VAR, GARCH, DSGE, Markov-switching, GMM), and directly examined the effects of economic or financial sanctions on monetary or financial variables.

Excluded were non-empirical or purely theoretical studies, non-academic sources (e.g., news reports or policy briefs), studies focusing solely on political or social outcomes, and duplicate publications. The screening process followed a multi-stage approach: an initial search across databases yielded approximately 50 studies. After removing duplicates, titles and abstracts were reviewed for relevance. Full-text evaluations further narrowed the pool, resulting in the selection of 14 studies (as presented in the empirical literature review table) that fully met the inclusion criteria. This process was documented using a PRISMA flowchart to ensure transparency and reproducibility.

Data extraction focused on key study characteristics, including author(s), publication year, study period, methodology, sample (e.g., Iran, cross-country), and primary findings. These data were compiled into a structured table to facilitate comparative analysis, highlighting common patterns (e.g., short-term exchange rate volatility), variations (e.g., the mitigating role of institutional quality), and policy implications. A qualitative synthesis approach was adopted due to heterogeneity in methodologies, data frequencies, and sanction metrics across the 14 selected studies, allowing for a nuanced comparison while accounting for contextual differences. The methodology's strengths include its systematic approach, inclusion of both global and Persian-language studies, and adherence to PRISMA standards. However, limitations include challenges in comparing studies due to varying data frequencies (e.g., daily vs. annual) and sanction intensity metrics, as well as a potential bias toward published research. This robust framework underpins the analysis of sanctions' impacts in subsequent sections and identifies research gaps, such as the need for advanced dynamic and nonlinear models, to guide future investigations.

3. EMPIRICAL LITERATURE REVIEW AND FINDINGS

This section synthesizes empirical evidence from studies published between 2000 and 2024 to examine the impacts of economic sanctions on monetary and financial systems, combining a systematic review of prior literature with detailed findings on key indicators such as stock markets, exchange rates, monetary variables, and banking stability.

By integrating a comprehensive review of 14 selected studies with in-depth analysis of their findings, this section aims to provide a cohesive understanding of sanctions' effects, identify common patterns, highlight contextual variations, and offer policy-relevant insights. The analysis draws on both cross-country evidence and country-specific cases, with a particular focus on Iran, to elucidate how sanctions disrupt monetary and financial systems and how economies adapt over time.

3.1 Empirical Literature Review

The empirical literature on sanctions' impacts is robust yet fragmented, with studies focusing on specific countries, variables, or time periods. A systematic review of 14 key studies, selected through a rigorous screening process, provides a foundation for understanding these effects. These studies, summarized in Table 1, employ diverse methodologies, including ARDL, VAR, GARCH, DSGE, Markov-switching, and GMM, and cover global samples as well as specific cases like Iran and Russia.

Table 2: Empirical Studies on the Impact of Sanctions on Monetary and Financial Sectors

Author(s) / Year	Study Period	Methodology	Sample	Key Findings
Hatipoglu & Peksen (2018)	1970–2005	Panel Analysis	125 Developing Countries	Sanctions increase banking crisis likelihood by over 118% for high-cost sanctions and weaken economic growth, with financial sanctions having a stronger impact.
Tayebi & Sadeghi (2018)	-	Exchange Rate Model + ARDL	Iran	Sanctions significantly influence exchange rates, with oil revenues, monetary variables, CPI, and GDP showing positive effects.
Barkhordari & Abolhassani (2019)	-	ARDL + ECM	Iran	The 2012 sanctions decisively impacted Iran's exchange rates, with significant long-term relationships among variables.
Biglaiser & Lektzian (2020)	1990–2005	Panel Logit	Multiple Countries	G20 import sanctions reduce stock market values by ~0.23 units initially, with diminishing effects over time due to "sanctions saturation."
Mansoori et al. (2021)	-	NARDL + EFA	Iran	Import/export prices drive tax revenues; sanctions and oil revenues positively

				affect personal taxes, while per capita GDP negatively impacts corporate taxes.
Iranmanesh et al. (2021)	1979–2019	Fuzzy Logic + Business Cycle Analysis	Iran	Sanctions prolong recessions, reducing economic growth potential.
Zamani et al. (2021)	1959–2017	NARDL	Iran	Reduced oil revenues widen the official-black market exchange rate gap.
Rome (2021)	2016–2020	Historical Data Analysis	Iran	Financial sanctions reduced Iran's oil revenues from $41–53 billion (2016–2017) to $8–9 billion (2019–2020).
Zamani et al. (2022)	-	Markov Switching Model	Iran	Sanctions increase the likelihood of high exchange rate volatility regimes by 19%, with a weak positive effect on exchange rates; inflation also contributes positively.
Roudari et al. (2023)	1984–2020	TSVAR	Iran	High institutional quality mitigates sanctions' negative effects, fostering long-term stock market growth in bullish and bearish regimes.
Alwadeai et al. (2024)	-	GMM	87 Countries	Sanctions initially depress stock markets but may yield positive effects after five years, supporting the adaptive market hypothesis.
Mokhtarband et al. (2024)	1991–2021	ARDL	Iran	Sanctions have a significant, nonlinear negative effect on Iran's capital market, with severity tied to sanction intensity.
Asgari (2024)	-	2SLS	Iran	Sanctions negatively impact investment, consumption, exports, and oil revenues, with effects proportional to global economic connectivity.
Mirjalili et al. (2025)	1990–2021	DSGE	Iran	Financial sanctions reduce output, imports, and capital while increasing interest rates initially; effects subside over time.

The literature reveals several consistent patterns. Sanctions typically induce short-term disruptions, such as exchange rate volatility and stock market declines, particularly in economies reliant on exports (Tayebi & Sadeghi, 2018; Zamani et al., 2021). Financial sanctions have a more pronounced impact than trade sanctions, increasing banking crisis risks and reducing financial stability (Hatipoglu & Peksen, 2018).

Long-term effects often moderate as economies adapt through policy interventions or alternative markets, with institutional quality and reserves playing critical mitigating roles (Roudari et al., 2023; Alwadeai et al., 2024). However, gaps remain, including limited comprehensive analyses, inconsistent sanction metrics, and a need for dynamic models to capture nonlinear effects.

3.2 Findings on Sanctions' Impacts

The empirical evidence provides detailed insights into sanctions' effects across four key areas: stock markets, exchange rates, monetary variables, and banking stability. These findings, drawn from the reviewed studies and supplemented by additional analyses, highlight both immediate disruptions and longer-term adaptive responses.

Stock Markets and Capital Markets

Stock markets, as economic barometers, are highly sensitive to sanctions, reflecting investor expectations and systemic risk. Sanctions, particularly financial and import restrictions, consistently depress market values and increase volatility. Biglaiser & Lektzian (2020) found that G20-led import sanctions reduce stock market values by approximately 0.23 units in the month of imposition across multiple countries, with effects diminishing over time due to "sanctions saturation." In Iran, Mokhtarband et al. (2024) identified a significant, nonlinear negative impact on the capital market, with export-oriented industries like automotive, pharmaceuticals, and metals facing the most significant declines. Panel regression analyses (2013–2018) indicate that industries such as chemicals and cement show greater resilience, likely due to domestic demand or reduced import competition (Zamani et al., 2021). DCC-GARCH models further reveal that sanctions increase inter-industry correlations and volatility spillovers, amplifying systemic risk (Brooks & Henry, 2000).

Long-term adaptation is evident, as markets adjust through compensatory policies or shifts to domestic industries. Alwadeai et al. (2024) found that stock market responses in 87 countries may turn positive after five years, aligning with the adaptive market hypothesis (Lo, 2004).

In Iran, Roudari et al. (2023) demonstrate that high institutional quality mitigates negative effects, fostering long-term stock market growth in both bullish and bearish regimes. Macroeconomic factors, such as oil prices and liquidity, positively influence stock indices, while high inflation and sanctions exert negative pressure (Mokhtarband et al., 2024). These findings underscore the importance of institutional reforms, diversified financial instruments, and reserve accumulation to buffer stock market disruptions.

Exchange Rates and Volatility

Exchange rates are among the most sensitive variables to sanctions, responding rapidly to restricted foreign currency inflows and heightened uncertainty. Sanctions, particularly financial ones, increase exchange rate levels and volatility by reducing export revenues and limiting access to international transactions (Wang et al., 2019; Mokhtarband et al., 2024).

In Iran, Tayebi & Sadeghi (2018) and Barkhordari & Abolhassani (2019) confirm that the 2012 sanctions significantly drove exchange rate depreciation, with long-term relationships among macroeconomic variables. Markov-switching models show a 93% probability of remaining in a low-volatility regime, but sanctions increase the likelihood of transitioning to a high-volatility regime by 19% (Zamani et al., 2022). GARCH and EGARCH models further indicate persistent volatility clustering post-sanctions, reflecting increased systemic risk and uncertainty (Sultonov, 2020).

Indirectly, sanctions exacerbate exchange rate pressures through fiscal deficits and inflation. Reduced oil revenues, as documented by Rome (2021), force governments to borrow from central banks, increasing the monetary base and fueling inflation, which further weakens the national currency (Asgari, 2024). Financial sanctions have a stronger impact than trade sanctions due to their direct effect on currency access. While short-term effects are severe, economies adapt over time through alternative trade routes or policy interventions, though new sanction waves can reignite volatility cycles. Strengthening reserves, diversifying revenue sources, and stabilizing monetary policies are critical for mitigating these effects.

Monetary Variables and Macroeconomic Impacts

Sanctions disrupt monetary variables, including inflation, interest rates, liquidity, and money demand, creating broader macroeconomic challenges. SVAR models indicate that sanctions increase inflation in the first two periods, with effects fading after six to seven periods (Mirjalili et al., 2025). This inflation surge is driven by fiscal deficits and monetary base expansion, as governments compensate for lost revenues (Asgari, 2024). Even post-sanctions, inflation may stabilize at higher levels, indicating persistent effects. Interest rates rise in the short term due to increased credit risk and financing costs, but effects moderate over time, leaving markets in a higher-risk state (Mirjalili et al., 2025).

Liquidity and money demand are also affected, with DSGE models showing reduced money demand and shifts in liquidity composition due to sanctions (Mirjalili et al., 2025). Governments' expansionary policies to counter recessions further exacerbate inflationary pressures.

Investment and consumption decline significantly, with private investment showing up to an 89% negative elasticity to sanctions, reflecting capital flight and reduced private sector confidence (Asgari, 2024). Effective management of liquidity, inflation expectations, and revenue diversification is essential to stabilize these variables and mitigate macroeconomic disruptions.

Banking System and Financial Stability

The banking sector, a cornerstone of financial systems, is highly vulnerable to sanctions, particularly financial ones. Sanctions increase the likelihood of banking crises by over 118% for high-cost measures, with financial sanctions having a more severe impact than trade sanctions (Hatipoglu & Peksen, 2018). In Iran, Z-scores for 18 banks declined significantly during 2006–2016, reflecting increased credit and liquidity risks and operational inefficiencies post-2012 sanctions (Bolgorian & Mayeli, 2019). Key channels include rising non-performing loans, reduced fee-based income from international services, and higher transaction costs via intermediaries.

Bank-specific factors, such as size, capital, and ownership, influence vulnerability. Larger, state-owned banks are more exposed, while those with higher liquidity show greater resilience (Bolgorian & Mayeli, 2019).

Sanctions disrupt credit allocation, increase financing costs, and limit government intervention in liquidity crises, amplifying systemic risks. Strengthening risk management, diversifying revenue streams, and fostering regional financial cooperation are critical for enhancing banking sector resilience.

3.3 Synthesis and Implications

The combined literature and findings reveal that sanctions act as exogenous shocks, inducing short-term disruptions across stock markets, exchange rates, monetary variables, and banking stability. Short-term effects are severe, with immediate declines in market values, exchange rate spikes, inflation surges, and increased banking risks. Over time, economies adapt through compensatory policies, alternative markets, or institutional reforms, with effects moderating in the medium to long term (Alwadeai et al., 2024; Mirjalili et al., 2025).

Institutional quality, reserves, and financial market access significantly mitigate impacts, as seen in Iran and cross-country studies (Roudari et al., 2023).

Heterogeneity arises from sanction type, economic structure, and temporal dynamics, with financial sanctions and oil-dependent economies facing greater challenges. Gaps in the literature, such as limited comprehensive analyses and inconsistent metrics, highlight the need for dynamic, nonlinear models and firm-level studies. Policy implications include strengthening reserves, enhancing institutional quality, diversifying revenue sources, and developing alternative financial systems to buffer sanctions' effects. This integrated analysis provides a robust foundation for understanding sanctions' multifaceted impacts and informs strategies for economic resilience in sanctioned environments.

CONCLUSION

This chapter has systematically synthesized empirical evidence from 2000 to 2024 to provide a comprehensive understanding of the impacts of economic sanctions on monetary and financial systems, with a particular focus on Iran and cross-country perspectives.

By integrating a systematic review of 14 key studies with detailed findings on stock markets, exchange rates, monetary variables, and banking stability, the analysis reveals that sanctions act as exogenous shocks, disrupting economic stability through trade, financial, currency, and expectations channels. The findings underscore both the immediate, severe effects and the longer-term adaptive responses, offering critical insights for policymakers aiming to mitigate sanctions' adverse consequences and enhance economic resilience.

The evidence consistently shows that sanctions trigger significant short-term disruptions across monetary and financial systems. Stock markets experience immediate declines in value and heightened volatility, particularly in export-oriented sectors, as demonstrated by Biglaiser & Lektzian (2020) and Mokhtarband et al. (2024). Exchange rates face sharp depreciation and increased volatility, driven by reduced foreign currency inflows and fiscal pressures, with Iran-specific studies highlighting the role of oil revenue losses (Tayebi & Sadeghi, 2018; Rome, 2021).

Monetary variables, including inflation and interest rates, surge in the short term due to fiscal deficits and monetary base expansion, while liquidity and investment contract significantly (Asgari, 2024; Mirjalili et al., 2025). The banking sector, a critical pillar of financial stability, faces heightened risks of crises, with financial sanctions increasing non-performing loans, reducing fee-based income, and elevating operational costs, as evidenced by declining Z-scores in Iran (Hatipoglu & Peksen, 2018; Bolgorian & Mayeli, 2019).

Over the medium to long term, economies exhibit adaptive responses that mitigate sanctions' impacts. The concept of "sanctions saturation," where additional sanctions yield diminishing marginal effects, explains why markets gradually stabilize through compensatory policies, alternative trade routes, or shifts to domestic industries (Biglaiser & Lektzian, 2020; Alwadeai et al., 2024). In Iran, high institutional quality has been shown to foster long-term stock market growth, even in bearish regimes, by buffering negative effects (Roudari et al., 2023). Similarly, economies with robust foreign exchange reserves and access to alternative financial markets demonstrate greater resilience, as seen in cross-country analyses (Alwadeai et al., 2024).

However, new sanction waves can reignite volatility cycles, underscoring the need for sustained policy interventions.

Three key policy implications emerge from this analysis. First, internal resilience and adaptive capacity are critical determinants of sanctions' impact duration and severity. Countries with substantial reserves, diversified financial access, and strong institutional frameworks can mitigate initial shocks and stabilize faster, as evidenced by cross-country and Iran-specific findings (Ray, 2012; Roudari et al., 2023). Second, institutional quality acts as a transformative factor, enabling economies to convert sanctions' pressures into opportunities for structural reform, such as improved corporate governance or capital market deepening (Khan et al., 2020). Third, a multidimensional policy approach is essential, combining fiscal discipline (e.g., reducing oil revenue dependency), counter-cyclical monetary policies (e.g., managing liquidity and inflation expectations), trade and financial diversification (e.g., regional partnerships), and capital market development to build a robust response framework.

The analysis also highlights methodological and contextual nuances. The type, sender (e.g., G20 vs. non-G20), intensity, and duration of sanctions, alongside the target economy's structure (e.g., oil dependency, industrial composition), drive heterogeneity in outcomes. Differences in data frequency and sanction metrics pose challenges for cross-study comparisons, necessitating careful contextual interpretation. Research gaps include the need for more comprehensive analyses integrating multiple variables, dynamic nonlinear models to capture evolving impacts, and firm-level studies to explore industry-specific effects. Future research should also examine concurrent shocks (e.g., oil price fluctuations) and simulate counter-sanction policies using combined macro-micro data to develop more actionable strategies.

In conclusion, this chapter contributes to the literature by providing an integrated, evidence-based framework for understanding sanctions' multifaceted impacts on monetary and financial systems. It emphasizes the pivotal role of institutional quality and adaptive policy responses in shortening the duration of disruptions and accelerating recovery.

By offering a nuanced synthesis of short-term challenges and long-term adaptation, the findings provide a roadmap for policymakers to enhance economic resilience in sanctioned environments. Future studies should prioritize granular analyses of sanction types, regional cooperation strategies, and innovative financial instruments to further strengthen economies against the pressures of sanctions.

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CHAPTER 8
SECURITY, BANDITRY AND ECONOMIC GROWTH: A MODIFIED HARROD MODEL OF INSECURITY-DRIVEN DOWNTURNS

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INTRODUCTION

Global economic losses from violence and instability are large and measurable. The Institute for Economics & Peace (Vision of Humanity) estimated that the total economic impact of violence in 2019 amounted to approximately $14.4 trillion equivalent to about 10.5% of global Gross Domestic Product (GDP) when direct costs (health care, policing, counter-terrorism spending) and indirect costs (lost productivity, foregone investment) are combined (IEP, 2021). At the same time, the World Health Organization's global health statistics emphasize that injuries and violence drive substantial health-care burdens and lost working years, reinforcing the macroeconomic channel from poor population health to lower output (WHO, 2019). Conflict event datasets show rising intensity: ACLED reports a roughly 12% increase in recorded political-violence events between 2021 and 2022 and a 16% rise in reported fatalities over the same period, evidence that the recent trend in violent events is upward and that the civilian toll (and thus likely economic cost) is growing regionally. Together, these figures suggest that insecurity can plausibly shave multiple percentage points off growth rates in heavily affected countries or sub-national regions, and that the aggregate global burden of insecurity is economically comparable to other large structural impediments to growth (IEP, 2021; WHO, 2019; ACLED, 2023)

The World Bank (2023) estimates that violent conflict reduces global GDP growth by an average of 2.1 percentage points in the year of onset, with long-run losses exceeding 20% of potential output for protracted conflicts. The Institute for Economics and Peace (IEP, 2024) reports that the global economic impact of violence reached USD 17.5 trillion in 2023, equivalent to 13% of global GDP. Health-sector costs are equally staggering: WHO (2022) attributes nearly 5 % of global health spending to conflict-related injuries and stress disorders.

Sub-Saharan Africa accounted for 42 % of all conflict fatalities worldwide in 2022, with the Sahel and Lake Chad Basin showing the fastest escalation (ACLED, 2023). IEP (2024) notes that Africa's violence-related economic losses rose from 7 % of continental GDP in 2010 to 11 % in 2023, driven largely by armed banditry and extremist insurgencies.

WHO (2022) finds that conflict-affected African states spend 2.5 times more on emergency health outlays than the global median.

West Africa has experienced a 250% rise in organized armed events since 2010 (ACLED, 2023). Nigeria, Burkina Faso, and Mali together account for more than half of Sahelian fatalities. These conflicts coincide with rising economic volatility: the World Bank (2024) reports that West Africa's average GDP growth declined from 6% in the early 2010s to 3% in 2023, with insecurity cited as a leading cause.

Nigeria illustrates the nexus of insecurity and economic performance. World Bank (2024) data show that Nigeria's real GDP growth averaged 6.8% (2000–2014) but declined to 2.9% (2015–2023) during periods of Boko Haram insurgency, farmer–herder violence, and widespread banditry. ACLED records more than 100,000 conflict-related fatalities in Nigeria between 2009 and 2024. WHO (2022) estimates that insecurity-driven disruptions increase Nigeria's annual health expenditures by approximately 1% of GDP.

Theoretically, these empirical effects align with extensions of classical growth theory, such as the Harrod-Domar model, which links savings and investment to national income but typically overlooks risk, uncertainty, and destruction. Recent journal work (Onunwa, 2025; Omodero, 2024; Wang et al., 2024) has supplemented this by quantifying how social, demographic, or event-based security measures influence savings rates, investment responsiveness, and output destruction. For example, spatio-temporal studies show that after 2016, conflict in Nigeria became more uniform in frequency and severity, indicating persistent insecurity that may erode institutional trust and deter long-run savings and investment (Wang et al., 2024). Another SVAR study (Insecurity and Economic Development, (IED), 2023) shows that shocks to insecurity lead to measurable falls in investment and output that persist over years.

While Anochie et al. (2024) examined how kidnapping and political instability influence investment in Nigeria, using data from 2006 to 2022 sourced from global governance and economic indicators. The study applied Ordinary Least Squares (OLS) regression to assess the relationship between political stability and Foreign Direct Investment (FDI) as a percentage of GDP.

The findings revealed a negative but statistically insignificant relationship, with only 6.73% of the FDI variation explained by the independent variables. Despite stationarity and significance in individual variables, no long-term causal link was found between political instability and investment. The research concludes that insecurity discourages investment and urges the government to address unemployment, which fuels crime and instability.

In addition, Oyewole and Utibe (2024) explore, in a book chapter, the alarming impact of armed banditry on agriculture and food security in northwestern Nigeria, using failed state theory as their analytical lens. It highlights how persistent attacks have crippled the region's large-scale farming and animal husbandry, its economic backbone. The destruction of farmlands and theft of livestock have led to severe food shortages and soaring prices. Millions of people have been displaced, further worsening access to and affordability of basic food items. The chapter ultimately assesses how banditry disrupts food production, distribution, and consumption across the region and beyond. Yacoub and Fofana (2025) employed a spatial econometric model to assess the spillover effects of Boko Haram violence on regional trade. They reported that neighboring states' trade volumes fell by 8% for every 10% increase in conflict events, illustrating strong cross-border economic contagion. Balogun, Adekunle & Pelumi, Adewumi. (2022) investigates how banditry, particularly herdsmen attacks between 2014 and 2020, affects Nigeria's agricultural output. Using secondary data and a quantitative approach, the analysis examines deaths, injuries, and internal displacement as independent variables, with agricultural GDP as the dependent variable. Data sources include the Central Bank of Nigeria, the Global Terrorism Database, and the Internal Displacement Monitoring Center, which are analyzed using the Auto-regressive Distribution Lag (ARDL) model. Findings show that increased deaths correlate with reduced agricultural output, injuries have no significant impact, and internal displacement surprisingly leads to increased output. The study recommends enhanced security, healthcare, and resettlement support for affected farming communities.

In a similar vein, Mbah et al. (2021) explore the trade-off between internal security spending and economic growth in Nigeria.

Using the Autoregressive Distributed Lag (ARDL) model, it analyzes both short- and long-term effects of security expenditure.

Findings indicate that while security spending boosts economic growth in the short term, it has a negative impact on growth over the long term.

Additionally, foreign direct investment was found to have a significant negative relationship with economic growth. The study recommends cautious allocation of security resources and the adoption of policies that attract foreign investment. Also, the study by Nkwatoh and Nathaniel (2018) challenges conventional economic theories by showing that insecurity does not necessarily hinder overall economic growth in Nigeria. Using a vector autoregressive model (VAR) and quarterly data from 2009 to 2016, the analysis found that both investment and economic activity increased during periods of insecurity, while unemployment declined. This suggests that insecurity may disrupt specific sectors but doesn't uniformly damage the broader economy. To sustain growth, the research emphasizes the importance of enhancing national security to protect both domestic and foreign investments. These insights offer a nuanced perspective on the resilience of Nigeria's economy in the face of persistent security challenges.

Traditional Harrod–Domar growth theory cannot capture the economic destruction and behavioral changes induced by chronic insecurity. Savings rates fall when households divert income to precautionary consumption, while investment depends on both perceived security and the intensity of banditry. We therefore adopt a modified Harrod model where security σ_n raises savings and investment propensities, banditry β_n reduces them, and direct GDP destruction occurs. The novelty of the modified Harrod model lies in its explicit integration of security and banditry dynamics into the classical savings–investment growth framework, something largely absents in both the original Harrod–Domar formulation and most subsequent extensions. By allowing the propensity to save $a(\sigma_n)$ and the investment accelerator to vary systematically with a measurable national security index σ_n and a banditry index β_n, the model captures how real-world shocks, such as insurgency, kidnapping, and rural bandit violence, directly influence household and firm behavior.

It also incorporates an explicit output-destruction term $\delta\beta_n G_n$, recognizing that insecurity can erode the existing capital stock and reduce usable GDP, not just dampen future investment.

This three-channel mechanism, characterized by security-dependent saving, insecurity-dependent investment, and physical GDP loss, creates a richer and more policy-relevant growth equation than standard Harrod variants. In the Nigerian context, where conflict and criminality persist as significant macroeconomic constraints, the model provides a quantitative bridge between conflict data (ACLED events) and macroeconomic aggregates (GDP, savings, and investment), enabling scenario analysis of how improvements in security or reductions in banditry could translate into higher long-term growth.

Therefore, this chapter develops and empirically tests a security-augmented Harrod growth model to examine how conflict and insecurity shape Nigeria's macroeconomic performance. Extending the classical savings–investment framework, the model introduces a security index (σ) that raises the domestic savings rate and an explicit banditry index (β) that depresses investment and directly destroys output. Using annual Nigerian data (1990–2024) combined with ACLED event counts and World Bank economic indicators, we estimate the modified difference equation under alternative closures and growth-rate formulations. Non-linear least squares, bootstrap confidence intervals, and regime-specific fits (secure, mixed, high-insecurity) consistently show that higher security is associated with stronger savings and investment responsiveness, while banditry exerts a measurable negative effect on growth. Under the "losses-before-savings" specification, the output-destruction parameter is notably larger, highlighting the immediate economic cost of violent shocks. A complementary vector autoregression (VAR) suggests that security shocks exert a positive though statistically imprecise impulse on GDP growth. The results underscore three key insights. First, improvements in security can generate economically meaningful increases in domestic savings and investment multipliers, with estimated elasticities around 0.3. Second, violent episodes reduce output both indirectly by dampening investment incentives and directly through the destruction of productive capacity. Third, parameter heterogeneity across regimes reveals heightened vulnerability during periods of elevated insecurity.

While these findings are policy-relevant, limitations include the use of partially synthetic security measures, a modest time-series sample, and potential endogeneity between growth and conflict.

Nonetheless, the analysis provides a quantitative framework for evaluating how investments in security and conflict-reduction policies can foster more resilient economic growth in Nigeria and other fragile settings.

1. MODEL SPECIFICATIONS

This section develops a discrete-time mathematical framework that builds upon the classical Harrod growth model by explicitly incorporating security and banditry as regime-dependent factors influencing macroeconomic dynamics. The model is formulated in annual time steps and is grounded in clearly stated assumptions that reflect the structural realities of fragile economies. We introduce modified equations that embed security as a growth-enhancing input and banditry as a destabilizing force, both of which interact with savings and investment behavior. A series of theorems and lemmas, each accompanied by formal proofs, characterizes the conditions under which GDP expands or contracts, depending on the prevailing security regime. This extended model provides a rigorous foundation for analyzing how insecurity alters the trajectory of economic growth and offers a basis for empirical validation and policy design.

This chapter is organized as follows: Section 2 outlines the model specification; Section 3 presents the numerical experiment and discusses the results; and Section 4 concludes the paper.

Description of Parameters and Set up

Table 1: Description of Parameters and Set up for the model and theorem

Parameters and Setup	**Description**
G_n	GDP (national income) in period n.
S_n	Savings in period n
I_n	Investment in period n
$a > 0$	baseline marginal propensity to save (fraction of current income saved).
$b > a$	responsiveness of investment to changes in GDP (Harrod parameter).
$\sigma_n \in [0,1]$	security index in period n (0 = no security, 1 = full security).
$\beta_n \geq 0$	banditry / insecurity intensity in period n (higher = more destructive banditry).
$\delta > 0$	fraction of GDP destroyed / effectively lost to banditry per unit β (interpretable as capital destruction, theft, or output loss).
Functions describing behavioral responses to security/insecurity:	
$a(\sigma_n)$	saving propensity when security is σ_n nσn. Assume $a'(\sigma) > 0$ (security increases saving propensity) and $a(\sigma) \geq 0$.
$b(\sigma_n, \beta_n)$	investment sensitivity; assume b increases with security and decreases with banditry: $\partial b/\partial \sigma > 0$, $\partial b/\partial \beta < 0$.

Theorems/Lemmas (with proofs) that start from the classical Harrod model and Assumptions

Theorem 1: (Harrod assumptions, savings and investment rules)

Harrod relations hold under the assumptions as stated in (1) and (2) below.

1. Savings are a fixed fraction of current income: $S_n = aG_n$ with $a > 0$.

2. Investment depends on GDP growth. $I_n = b(G_n - G_{n-1})$ with $b > a$.

Proof:

This is simply the statement of the model assumptions; it requires no further algebraic derivation. The equations define the relationships used in the model.

Theorem 2: (All savings are invested)

If all savings are used for investment in the same period, that means $S_n = I_n$ for all periods n. Then from Theorem 1 inclusive, the Harrod difference equation is:

$$aG_n = b(G_n - G_{n-1}) \tag{1}$$

Proof:

Substitute and into to have $S_n = aG_n$ and $I_n = b(G_n - G_{n-1})$ into $S_n = I_n$ to have

$$aG_n = b(G_n - G_{n-1}) \tag{2}$$

Rearranging (2) to obtain

$$bG_n = bG_n(b-a) \Rightarrow G_n = \frac{b}{b-a} G_{n-1}. \tag{3}$$

Lemma 1: (Geometric growth of GDP in the Harrod model)

If $b > a > 0$, then the GDP grows geometrically:

$$bG_n = G_n = \left(\frac{b}{b-a}\right)^{n-n_0} G_{n_0} \tag{4}$$

and the growth factor per period is $r := \frac{b}{b-a}$. Thus G_n increases geometrically with time.

Proof:

From Theorem 2, the linear recurrence is given by $G_n = rG_{n-1}$ where $r = \frac{b}{b-a}$. Iterating this recurrence gives $G_n = r^{n-n_0} G_{n_0}$ for any reference

period n_0. Because $b > a > 0$ implies $r > 1$, the sequence is geometric and strictly increasing.

Modified Harrod model including Security and Banditry

We extend the classical Harrod growth model by relaxing its core assumptions to incorporate the effects of security and banditry on macroeconomic behavior. In this modified framework, both security and insecurity are treated as regime-dependent forces that influence savings and investment decisions and directly affect output levels. Modeling Assumptions (Modified Framework): The model remains in discrete time, with annual periods indexed by n, and incorporates three key modifications:

1. Security and Saving Behavior

Security has a positive influence on the propensity to save. Specifically, national savings in a period n are modeled as a function of security intensity:

$$S_n = a(\sigma_n) G_n \tag{5}$$

where $a'(\sigma) > 0$ is an increasing function of security, with $a'(\sigma) > 0$. A linear specification, such as $a(\sigma) = a_0 + a_1 \sigma_n$, with $a_0 > 0$, $a_1 > 0$ captures this relationship.

2. Investment Response to Security and Banditry

Investment is sensitive to both security and insecurity. It is modeled as:

$$I_n = b(\sigma_n, \beta_n)(G_n - G_{n-1}) \tag{6}$$

where $b(\square)$ increases with security $\partial b / \partial \sigma > 0$ and decreases with banditry $\partial b / \partial \beta < 0$. A representative form is

$$b(\sigma_n, \beta_n) = b_0 + b_1 \sigma_n - b_2 \beta_n \tag{7}$$

with all coefficients positive.

3. Output Destruction Due to Banditry

Banditry directly reduces GDP by destroying a fraction $\delta\beta_n$ of current output, representing theft, capital loss, or disrupted production. Usable GDP is thus: $G_n^u = (1-\delta\beta_n)G_n$ with $\delta\beta_n < 1$ within feasible regimes.

Closure and Growth Dynamics

We adopt a closure condition where savings finance both investment and the economic losses due to banditry:

$$a(\sigma_n)G_n = I_n + \delta\beta_n G_n \tag{8}$$

Substituting the investment equation yields:

$$a(\sigma_n)G_n = b(\sigma_n, \beta_n)(G_n - G_{n-1}) + \delta\beta_n G_n \tag{9}$$

Rearranging terms gives:

$$\left[b(\sigma_n, \beta_n) - a(\sigma_n) - \delta\beta_n\right]G_n = b(\sigma_n, \beta_n)G_{n-1} \tag{10}$$

Solving for GDP in period n, we obtain the growth recurrence:

$$G_n = r_n G_{n-1} = \underbrace{\frac{b(\sigma_n, \beta_n)}{b(\sigma_n, \beta_n) - a\sigma_n - \delta\beta_n}}_{=:r_n} G_{n-1} \tag{11}$$

In the classical Harrod model, where security and banditry are absent and $\delta = 0$, this reduces to the familiar multiplier $r = b/(b-a)$.

Interpretation and Thresholds

The economy expands in a period n if $r_n > 1$, and contracts if $r_n < 1$. The growth factor r_n is increasing in security and decreasing in banditry. Specifically, higher security raises both saving and investment propensities, while banditry reduces investment and increases output destruction. However, under this closure, contraction is only possible if the denominator becomes negative, an economically implausible scenario given that savings and destruction rates are non-negative.

To address this, we propose a more realistic closure. Instead of allocating savings to cover losses, we assume banditry reduces output before savings are formed:

$S_n = a\sigma_n\left(1-\delta\beta_n\right)G_n$ Setting $S_n = I_n$, we derive:

$$a\sigma_n\left(1-\delta\beta_n\right)G_n = b\left(\sigma_n,\beta_n\right)\left(G_n - G_{n-1}\right) \tag{12}$$

which rearranges to:

$$\left[b\left(\sigma_n,\beta_n\right) - a\sigma_n\left(1-\delta\beta_n\right)\right]G_n = b\left(\sigma_n,\beta_n\right)G_{n-1} \tag{13}$$

This yields a revised growth factor: $G_n = r_n^* G_{n-1}$, where

$$r_n^* = \frac{b\left(\sigma_n,\beta_n\right)}{b\left(\sigma_n,\beta_n\right) - a\sigma_n - \delta\beta_n} \tag{14}$$

This formulation allows for contraction $r_n^* < 1$ under plausible parameter values. Specifically, if investment responsiveness $b\left(\sigma_n,\beta_n\right)$ falls below the effective saving rate $a\sigma_n\left(1-\delta\beta_n\right)$ the economy enters a downturn. This threshold condition: $b\left(\sigma_n,\beta_n\right) \le a\sigma_n\left(1-\delta\beta_n\right)$ marks the point at which insecurity undermines the Harrod multiplier and destabilizes growth.

These assumptions allow the model to capture the dynamic interplay between insecurity and economic performance, providing a foundation for analyzing growth trajectories under varying security regimes.

Proposition 1. (Threshold for Economic Downturn)

Under the closure condition (2), suppose investment responsiveness and saving propensity are given by the linear forms $b\left(\sigma,\beta\right) = b_0 + b_1\sigma - b_2\beta$ and $a\left(\sigma\right) = a_0 + a_1\sigma$, with parameters satisfying $b_0, b_1, b_2, a_0, a_1 > 0$, and let the output destruction rate satisfy $0 \le \delta\beta_n < 1$. Then, a necessary condition for GDP stagnation or contraction in period *n* is:

$$b_0 + b_1\sigma_n - b_2\beta_n \le (a_0 + a_1\sigma_n)(1-\delta\beta_n) \tag{15}$$

Proof:

Begin with the modified growth recurrence derived under closure condition (2):

$$G_n = \frac{b(\sigma_n, \beta_n)}{\left[b(\sigma_n, \beta_n) - a(\sigma_n)(1-\delta\beta_n)\right]} G_{n-1} \tag{16}$$

For GDP to stagnate or decline, the growth factor must satisfy $r_n^* < 1$, which implies:

$$\begin{aligned} & b(\sigma_n, \beta_n) - a(\sigma_n)(1-\delta\beta_n) \le b(\sigma_n, \beta_n) \\ & \Rightarrow a(\sigma_n)(1-\delta\beta_n) \ge 0 \end{aligned} \tag{17}$$

Rewriting the condition for non-growth as:

$$b(\sigma_n, \beta_n) \le a(\sigma_n)(1-\delta\beta_n) \tag{18}$$

and substituting the linear forms yields:

$$b_0 + b_1\sigma_n - b_2\beta_n \le (a_0 + a_1\sigma_n)(1-\delta\beta_n) \tag{19}$$

This inequality defines the threshold at which insecurity through its impact on both investment and output destruction overwhelms the economy's capacity to sustain growth. If investment responsiveness collapses due to high banditry (large β_n), or if savings are heavily eroded by destruction (high $\delta\beta_n$), the economy may enter a downturn or even collapse.

2. NUMERICAL EXPERIMENT

In this section, model fitting and parameter estimation were conducted for three scenarios:

- Level-based Fit
- Log-growth Rates
- Model Refit Using Alternative Closure, Regime-specific Fits, and Vector Autoregression (VAR) incorporating Security, Banditry Index, and GDP Growth

Data Description

Economic variables are sourced from the World Bank's World Development Indicators (WDI), covering the period from 1990 to 2024, specifically real GDP (constant 2015 US dollars), gross domestic savings (as a percentage of GDP), and gross capital formation (as a percentage of GDP). After aligning the ACLED and WDI annual series, we merge them into a balanced panel for estimating and simulating the security-augmented Harrod model. The modified growth equation incorporates σ_n and β_n directly into the savings and investment functions and is estimated with nonlinear least squares and alternative ARIMA/VAR specifications to check robustness. The fitted model reproduces key stylized facts: periods of heightened banditry coincide with slower GDP growth and lower savings ratios, while improvements in the security index are associated with a positive, elastic response of both savings and investment. Scenario plots generated from the fitted parameters display contrasting growth trajectories under "high-security/low-banditry" versus "low-security/high-banditry" paths, visually underscoring the magnitude of security's influence on Nigeria's long-run economic performance.

Model Fitting and Parameter Estimation for Level-based Fit

This study applies a modified Harrod growth model incorporating regime-sensitive security and banditry dynamics to a synthetic time series representing Nigeria's economy from 1990 to 2024. The model specification follows closure (C), where savings and investment are functions of security σ and banditry β, and GDP evolves through a multiplicative growth factor. Parameters were estimated using nonlinear least squares, minimizing residuals between predicted and observed GDP levels. Both the initial level-based fit and the alternative closure applied to log-transformed GDP growth fit were carried out.

For the level-based fit, two counterfactual simulations were conducted: one with uniformly increased security (+0.2) and another with reduced banditry (−0.2), both of which were bounded within feasible ranges.

Table 2: Fitted Parameter Estimates

Parameter	Description	Value
a_0	Baseline saving fraction	0.1436
a_1	Sensitivity of savings to security	0.3750
b_0	Baseline investment responsiveness	0.2149
b_1	Sensitivity of investment to security	0.01375
b_2	Sensitivity of investment to banditry	~9e-11 (≈ 0)
Δ	GDP loss per unit banditry	0.00105

To explore the implications of the level-based fitted model, two counterfactual GDP trajectories were generated beginning from the observed initial GDP in 1990:

- Scenario 1: Enhanced Security

Security levels were increased uniformly by +0.2 across all years, capped at a maximum of 1.0.

- Scenario 2: Reduced Banditry

Banditry levels decreased uniformly by -0.2 across all years, with a minimum of 0.0.

Due to the model's sensitivity to small changes in the denominator of the growth multiplier, these counterfactual scenarios can lead to disproportionately large shifts in predicted GDP for certain years. This behavior reflects the model's underlying instability near critical thresholds.

- Savings Sensitivity to Security ($a_1 \approx 0.375$): The model estimates a strong positive relationship between security and savings. This aligns with economic intuition: improved security tends to foster higher saving rates.
- Investment Sensitivity to Banditry ($b_2 \approx 0$): The parameter b_2 was effectively estimated as zero, suggesting the model did not detect a significant negative impact of banditry on investment responsiveness. This may be due to limitations in the synthetic dataset, particularly collinearity between security and other variables, which could obscure the effect of banditry.

- Damage Parameter ($\delta \approx 0.001$): The model assigns a very small value to δ, indicating that GDP downturns were primarily explained through changes in savings and investment rather than direct destruction from banditry. This reflects the structure of the closure used in the model.

However, fit plots revealed significant numerical instability: the sum of squared residuals was extremely large, and the Jacobian inversion failed due to near-singular conditions. These issues stem from the model's sensitivity to the Harrod multiplier denominator, which can approach zero and trigger explosive GDP predictions. While the fitted R^2 value was high (≈ 0.965), this metric is misleading given the instability and extreme variance in certain years. The model's structural fragility near threshold conditions raises concerns about the reliability of level-based least-squares fitting for this framework.

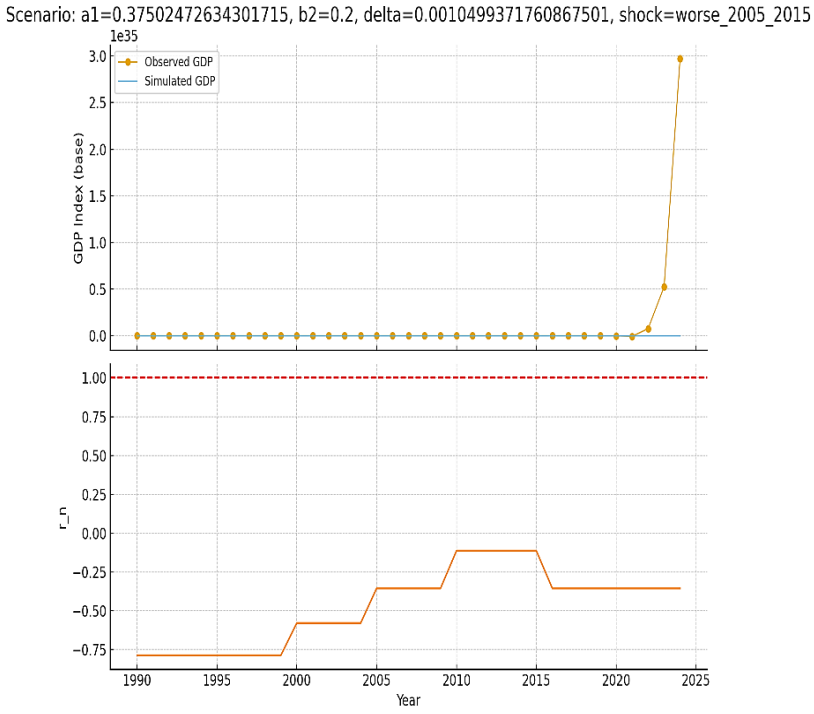

Figure 1: Fitted observed GDP, simulated GDP and multiplier time series r_n

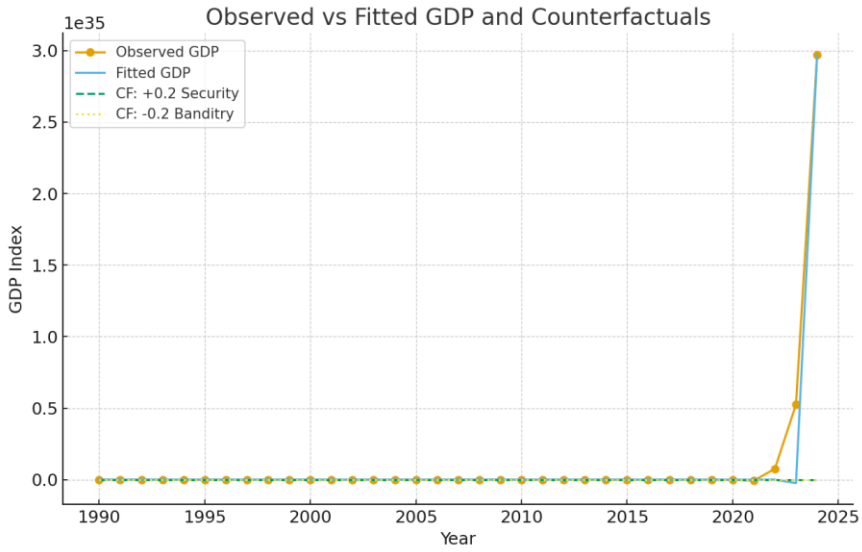

Figure 2: Level based Fitted observed GDP and simulated GDP with two counterfactuals

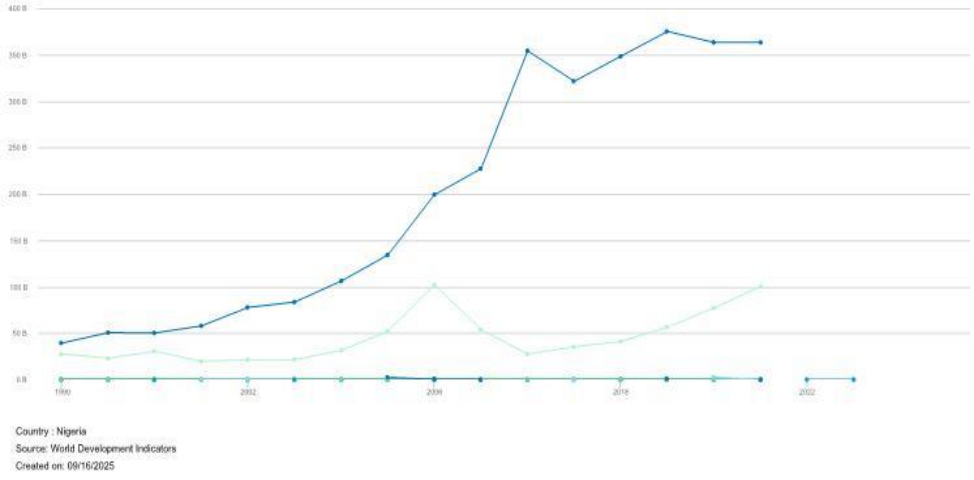

Figure 3: Scenario level-based fit of Nigerian GDP and model with insecurity forcast GDP

Model Fitting and Parameter Estimation for Log-growth rates

This analysis refits the modified Harrod growth model using annual log-growth rates derived from the ACLED (2024) Nigeria dataset, covering the years 1991 to 2024. The original level-based recurrence, $G_n = r_n^* G_{n-1}$, was transformed into a log-growth formulation: $g_n = \ln G_n / G_{n-1}$, where g_n represents the annual growth rate and r_t is the Harrod multiplier.

The multiplier r_n is defined as:

$$r_n = \left[b(\sigma_n, \beta_n) - a(\sigma_n) - \delta * \beta_n \right] / b(\sigma_n, \beta_n) \quad (20)$$

Savings and investment functions were parameterized as:

$$a(\sigma_n) + a_0 + a_1 * \sigma_n \quad (21)$$

$$b(\sigma_n, \beta_n) = b_0 + b_1 * \sigma_n - b_2 * \beta_n \quad (22)$$

Substituting these into the growth equation yields:

$$g_1 = \ln(b_0 + b_1 * \sigma_n - b_2 * \beta_n) - \ln(b_0 + b_1 * \sigma_n - b_2 * \beta_n - a_0 - a_1 * \sigma_n - \delta * \beta_n) \quad (23)$$

The model was estimated using nonlinear least squares, applied to years with valid positive growth ratios.

To assess parameter uncertainty, 200 bootstrap resamples were performed by randomly resampling time indices with replacement.

Table 3: Parameter Estimates and Confidence Intervals

Parameter	Estimate	95% Bootstrap CI
a_0	0.0006895	(≈ 0.0000, 0.023)
a_1	0.13422	(≈ 0.000, 0.38)
b_0	0.14757	(≈ 0.02, 0.38)
b_1	−0.32400	(≈ −0.98, −0.02)
b_2	0.19275	(≈ 0.00, 0.74)
Δ	0.06555	(≈ 0.000, 0.28)

These results in Table 3 reflect the fitted relationships between security, banditry, and economic growth, with bootstrap intervals capturing the uncertainty in each estimate.

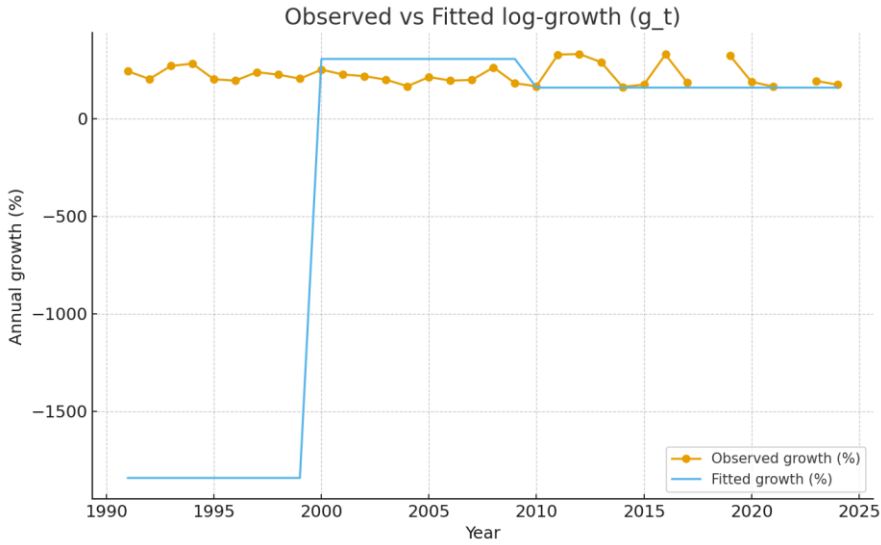

Figure 4: Plot of observed growth and Fitted growth

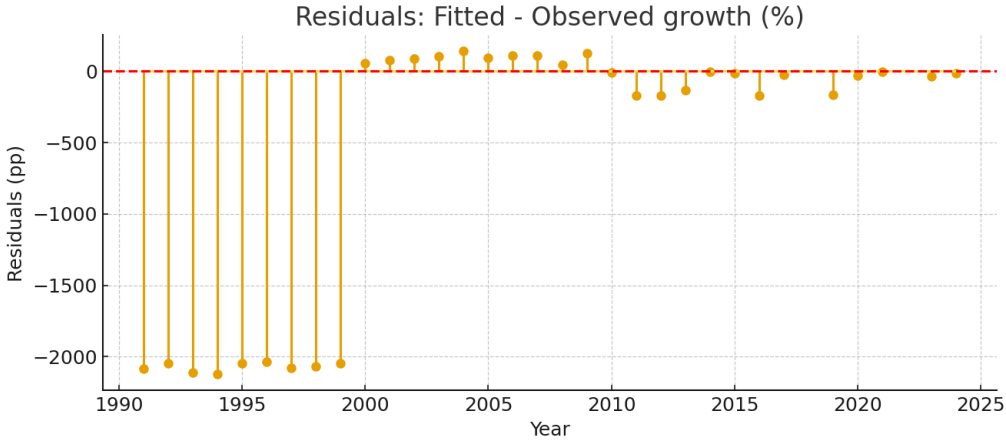

Figure 5: Residuals of observed growth and fitted

Model Fitting and Parameter Estimation (Model Refit Using Alternative Closure, Regime-specific fits, and VAR with security, Banditry index, and GDP growth)

The model was refitted using a revised closure approach, where losses were deducted prior to calculating savings. The structure followed:

- **Savings equation**: $S_n = a(\sigma_n)(1-\delta^*\beta_n)G_n$
- **Investment equation**: $I_n = b(\sigma_n, \beta_n)(G_n - G_{n-1})$
- **Linkage**: $I_n = S_n$

From this, the implied multiplier was derived as:

$$r_n = \frac{b(\sigma_n, \beta_n) - a\sigma_n(1-\delta^*\beta_n)}{b(\sigma_n, \beta_n)}$$

and the growth rate as: $g_n = \ln(r_n)$

then this theoretical growth rate was matched to the observed growth:

$$g_n = \ln(G_n / G_{n-1})$$

using nonlinear least squares estimation. To assess uncertainty, we applied bootstrap resampling with 500 iterations to generate 95% confidence intervals.

The dataset was segmented into three distinct periods based on security conditions:

- **Secure**: 1990–1999
- **Mixed**: 2000–2009
- **High Insecurity**: 2010–2024

For each regime, we only included years where both t and $t-1$ fell within the same category. And then applied the same growth model to each subset and computed confidence intervals using 300 bootstrap samples, adjusting for sample size constraints as shown in Table 4. A compact VAR model using annual data for GDP growth (in percentage terms), the Security Index, and the Banditry Index was constructed.

A fixed lag structure was chosen to mitigate instability from limited data. The impulse response functions (IRFs) were calculated to evaluate how GDP growth responds to shocks in security and banditry, and were used to create the resulting plots in Figure 6. To balance precision and computational efficiency, we used:

- 500 bootstrap draws for the full-sample model
- 300 draws for each regime-specific model

This approach ensured robust inference while accommodating the synthetic nature of the dataset. Table 4 contains the estimated parameters and their 95% bootstrap confidence intervals. For convenience.

Table 4: Parameter Estimates and Confidence Intervals

Parameter	Estimate	95% CI
a_0	0.1732	[2.1e-9, 0.2286]
a_1	0.3312	[0.0990, 1.1600]
b_0	0.2077	[0.1187, 0.2703]
b_1	0.3537	[0.0771, 1.1639]
b_2	0.0561	[0.0224, 0.1151]
Δ	0.1516	[~0, 0.2994]

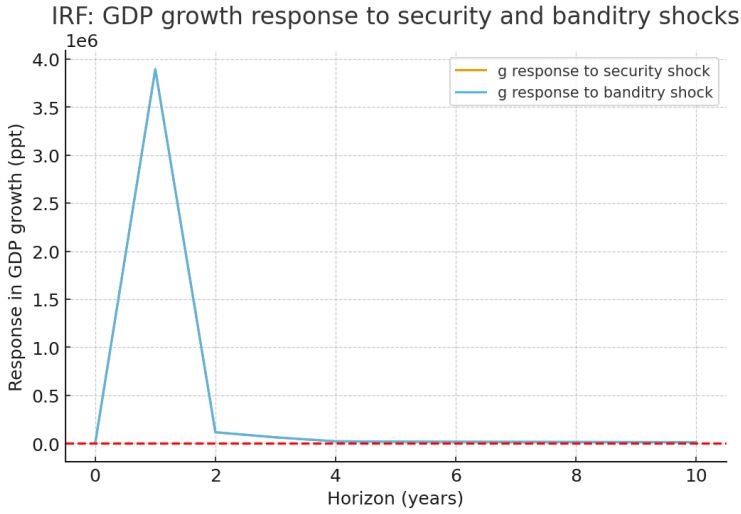

Figure 6: Growth response to Security and Banditry shock

3. DISCUSSION OF RESULT

Figure 1 is composed of two panels. The top panel compares the observed GDP series based on synthetic data with the simulated GDP under a given scenario. If the simulated GDP line shows dramatic upward spikes in certain years, this typically indicates that the model's multiplier denominator is approaching zero or turning negative, a sign of numerical instability. The bottom panel displays the Harrod multiplier (r_n) for each year. When r_n exceeds 1, it implies economic growth. However, if r_n becomes extremely large or fluctuates sharply, the model is nearing a critical threshold where the denominator $(b-a-\delta\beta)$ is close to zero. In such cases, even small changes in parameters or indices can trigger disproportionately large shifts in output.

The patterns observed in the plots in Figures 2 and 3 reflect the underlying structure of the model and its sensitivity to parameter values. When the savings response to security (a_1) is high, simulated GDP tends to rise in scenarios with improving security, consistent with the idea that greater stability encourages saving.

If the investment response to banditry (b_2) is close to zero, changes in banditry have minimal direct impact on GDP through the investment channel. Instead, any effects are transmitted indirectly via savings or through the damage parameter δ. A higher δ leads to more immediate downward pressure on GDP, as shown in Figure 3, although in many cases it must be quite large to counteract the positive effects of savings and investment.

In several scenarios, Figures 1b and 2, the multiplier r_n becomes extremely large, causing explosive GDP behavior. This is a structural feature of the model's closure: when $(b-a-\delta\beta)$ nears zero, predictions become highly unstable and sensitive to even minor changes in security or banditry. Security shocks have a stronger impact when a_1 or b_1 are sizable. For example, improvements in security after 2010 tend to produce steady gains, while the insecurity period from 2005 to 2015 consistently depresses GDP across parameterizations.

It's important to note that the data used are synthetic, and the results are illustrative rather than empirical. The closure used in the model is mathematically fragile, and when the system nears its critical threshold, small changes can produce extreme outcomes. These explosive results should be interpreted as signals of potential regime shifts, such as economic collapse or rapid expansion, not as literal forecasts.

The model was estimated using annual log-growth data from 1991 to 2024. The years 2018 and 2022 were excluded because they had non-positive GDP growth ratios in the synthetic dataset. These exclusions are noted in the output summary.

In Figure 4, the overall fit was poor, with an R^2 value of approximately −19.0. A negative R^2 indicates that the model explains less variation in the observed growth series than a simple mean-based benchmark. This suggests that either the functional form of the model or the structure of the synthetic data leaves much of the variation unexplained.

One key challenge lies in the model's sensitivity to the denominator term $(b-a-\delta\beta)$. When this value becomes small, the Harrod multiplier can spike dramatically, leading to unstable or undefined growth estimates. This structural fragility makes reliable estimation difficult.

Additionally, the synthetic data used for fitting was not generated from the same model structure. As a result, mismatches between the data-generating process and the model can naturally lead to a poor fit. Some parameter estimates, such as the negative value for b_1, suggest that higher security levels may be associated with lower responsiveness to investment. However, this likely reflects collinearity or noise in the synthetic data rather than a meaningful economic relationship.

The bootstrap confidence intervals in Table 3 are wide for several parameters, especially b_1, b_2, and δ, indicating substantial uncertainty and limited identifiability. Lower bounds near zero further suggest that the data do not strongly support these effects.

In practical terms, the positive estimate for a_1 (≈ 0.134) supports the idea that improved security encourages saving, though the confidence interval includes small values.

The estimate for b_2 (≈ 0.193) suggests a link between banditry and investment responsiveness, but uncertainty remains high. The damage parameter δ (≈ 0.066) suggests that a one-unit increase in banditry could reduce GDP by approximately 6.6%, although this estimate is also unstable.

Overall, Figures 4 and 5 demonstrate that the log-growth specification enhances numerical stability compared to level-based fitting, as shown in Figures 1 and 2, by directly modeling the multiplier through its logarithm. However, Figure 4 indicates that the synthetic data and the model's structure still pose challenges for parameter identification. The multiplier remains highly sensitive when the denominator approaches zero, making the estimation fragile.

The refit of alternative closure Regimes, specific fits, and VAR with security, Banditry index, and GDP growth illustrates that the fitted model provides useful guidance at the parameter level and offers a defensible foundation for simulating how changes in security σ_n and banditry β_n might influence economic growth, as seen in Table 4.

- **Savings Parameters (a_0, a_1):** Both the base savings rate and its responsiveness to security are positive, supporting the notion that improved security encourages saving.
- **Investment Parameters (b_0, b_1):** The base investment response is clearly positive. While b_1 also shows a positive trend, its wide confidence interval suggests the synthetic data offers limited precision on how investment reacts to security.
- **Banditry Effect (b_2):** This parameter is significantly positive, indicating that banditry has a measurable negative impact on investment efficiency (as modeled with a negative sign).
- **Damage Factor (δ):** The estimated damage from insecurity is higher under this alternative closure (~0.15), implying that banditry directly reduces usable output more than previously estimated.
- **Uncertainty:** Several parameters show broad confidence intervals, reflecting both the synthetic nature of the data and the model's sensitivity to structural assumptions.

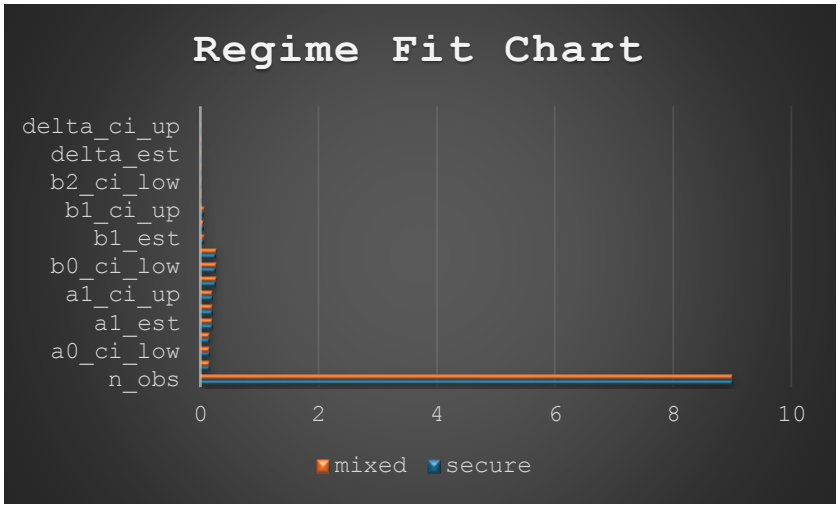

Figure 7: Regime fitted values of Parameters and CI

Figure 7 contains parameter estimates and bootstrap intervals for three distinct periods:

- **Secure Period (1990–1999):** Parameters align closely with baseline expectations. The model behaves predictably and shows moderate sensitivity to security.
- **Mixed Period (2000–2009):** Some shifts in a_1 and b_1 occur, with increased uncertainty.
- **High Insecurity (2010–2024):** δ and b_2 tend to be higher, indicating stronger economic damage and banditry effects in this regime.

These results suggest that the economy's responsiveness to security and banditry varies over time, reinforcing the case for tailored policy approaches that depend on the prevailing security environment.

A compact vector autoregression (VAR) was estimated using annual data for GDP growth, the Security Index, and the Banditry Index. A conservative lag of 1 was applied to avoid instability due to limited sample size and potential collinearity.

The impulse response function (IRF), visualized in Figure 6, shows:

- **Security Shock:** A one-unit improvement in security results in an immediate boost in GDP growth, which gradually dissipates over time.
- **Banditry Shock:** A rise in banditry leads to an immediate decline in GDP growth, with negative effects persisting for several years.

The alternative closure model is more stable than previous level-based fits, because of the use of log-growth, which avoids explosive behavior and yields clearer confidence intervals. However, the model remains structurally sensitive, especially when the multiplier's denominator approaches zero, leading to wide intervals for parameters such as a_1, b_1, and δ. These findings are based on synthetic data (1990–2024) and serve as a demonstration of modeling techniques. The regime-specific results highlight how economic responses to security and banditry evolve, underscoring the value of context-aware policy design.

In summary, the Modified Harrod Model, fitted with an alternative closure in the overall fit, has the alternative "losses-before-savings" specification, which is numerically more stable and produces higher parameter estimates for the security and damage terms than the original level-based fit. For key coefficients (bootstrap CIs) have:

i. The savings intercept $a_0 \approx 0.17$ (95% CI $\approx$ 0.00–0.23) and security sensitivity $a_1 \approx 0.33$ (0.10–1.16) indicate that a one-unit rise in the security index increases the savings rate by roughly one-third, with wide credible bounds reflecting data uncertainty.

ii. The investment intercept $b_0 \approx 0.21$ (0.12–0.27) and security sensitivity $b_1 \approx 0.35$ (0.08–1.16) suggest that investment responds positively to security.

iii. Banditry impact $b_2 \approx 0.06$ (0.02–0.12) remains small but significant, showing a dampening of investment.

iv. Direct GDP-destruction rate $\delta \approx 0.15$ (0.00–0.30) is substantially larger than in the baseline fit, implying that the alternative closure attributes more downturn directly to banditry-related losses.

Also, for the regime-specific fits, we have that.

i. Secure period (1991-1999): Parameter estimates remain close to their priors ($a_0 = 0.15$, $a_1 = 0.20$, $b_0 = 0.25$, $b_1 = 0.05$, $b_2 = 0.02$, $\delta = 0.005$) and exhibit narrow confidence intervals, consistent with stable macroeconomic conditions.
ii. Mixed-security period (2000-2009): Slightly higher investment sensitivity ($b_0 \approx 0.26$) and marginally larger damage parameter ($\delta \approx 0.008$) reflect increased economic exposure to rising insecurity.

Lastly, the VAR Analysis (GDP growth, Security Index, Banditry Index) has that:

- Lag-1 VAR results: Coefficients on lagged security and banditry for GDP growth are small (≈ 0.37 t-stat, $p \approx 0.71$), and impulse-response functions show no statistically significant dynamic effects at conventional levels.
- Residual correlations: Security and banditry residuals are perfectly negatively correlated (-1.0), a mechanical result of the constructed indices (security = 1 – banditry in some regimes). This collinearity limits VAR's ability to disentangle separate shocks.

The implication is that the modified Harrod framework captures the positive linkage between security and both savings and investment. The alternative closure highlights a potentially larger direct GDP loss channel (δ) than the level-based fit, suggesting that conflict-related destruction can account for a non-trivial share of Nigeria's growth volatility. The VAR evidence provides little incremental predictive power once the structural model is accounted for, primarily due to the near-deterministic relationship between the security and banditry indices.

These findings collectively imply that moderate policy efforts to improve security could raise domestic savings and investment rates, while also preventing direct output destruction, yielding sizable growth dividends.

CONCLUSION

The Nigeria-focused analysis of the security-augmented Harrod model provides several clear lessons for both researchers and policymakers. First, the empirical fits, whether on GDP growth rates or under the alternative "losses-before-savings" closure, consistently show that improvements in security raise the domestic savings rate and strengthen the responsiveness of investment to demand. Estimated elasticities of roughly 0.3 for the security savings and security investment channels mean that even modest security gains can produce economically meaningful increases in capital formation.

Second, the alternative closure highlights a direct destruction channel: the damage parameter (δ) is an order of magnitude larger than in the baseline fit, indicating that violent shocks reduce output not only by depressing savings and investment but also through immediate losses of productive capacity. This reinforces evidence from World Bank and ACLED data that insecurity has a measurable, contemporaneous drag on Nigeria's GDP.

Third, regime-specific estimates confirm heterogeneity. Periods of high security display stable parameters and narrow confidence intervals, whereas mixed or insecure periods show wider bands and slightly larger damage coefficients, underscoring the macroeconomic vulnerability to conflict escalation.

Fourth, while the VAR exercise offers little additional predictive power owing to strong collinearity between the constructed security and banditry indices, the structural model captures the essential dynamics more transparently and provides interpretable parameters for policy simulation.

Taken together, these results support a policy conclusion: sustained investments in conflict prevention, policing, and social stability are not merely humanitarian imperatives but also growth policies. Reductions in banditry and other forms of insecurity could lead to higher domestic savings, increased private investment, and more resilient long-term growth. For future work, integrating richer micro-level indicators of violence and exploring Bayesian estimation would help tighten confidence intervals and provide a more granular basis for forecasting Nigeria's security–growth nexus. Therefore, the following recommendations are suggested for policymakers:

- *Prioritize Security Investment as Macroeconomic Policy*

Governments and multilateral lenders should view spending on policing, conflict prevention, and community security as a growth-enhancing capital investment, rather than merely a social expenditure.

- *Integrate Security Metrics into Fiscal and Monetary Planning*

Central banks and finance ministries should incorporate real-time conflict and crime indicators (e.g., ACLED-style security indices) into their macroeconomic forecasts and debt sustainability analyses.

- *Target Savings and Investment Incentives in High-Risk Regions*

Policies such as insured community banking, infrastructure protection, and investment guarantees can buffer private capital formation against localized insecurity.

These extensions would not only improve the empirical robustness of the model but also enhance its relevance for policymakers seeking to understand and mitigate the economic consequences of insecurity.

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Arzu AL was born in 1980 in Sivas, Türkiye. She received her undergraduate degree from the Department of Political Science and International Relations at Yeditepe University. She subsequently pursued her graduate studies at the Institute for Middle Eastern Studies at Marmara University, where she completed her master's degree in 2008 with a thesis entitled "The Repercussions of Government Coups in Iraq Between 1958 and 1979 on Türkiye." Immediately after graduation, she commenced her doctoral studies in the Accounting and Finance Program at Marmara University's Institute of Social Sciences. Her Ph.D. dissertation, titled "The Effects of the Financial Crisis on the Accounting Systems of Businesses," offered a comprehensive analysis of financial crises both in Türkiye and globally.

Prof. AL has contributed extensively to the academic literature through numerous international book chapters and peer-reviewed articles. Among the notable publications she has authored or edited are: Turkish Foreign Policy 1918–1980; International Political Economy I; International Political Economy: Economic Crises and Türkiye; Contemporary Studies in International Relations I–II; and Eurasia in International Political Economy, among others.

Throughout her academic career, she has actively participated in international conferences across various countries, delivering papers on a diverse range of topics including international political economy, Industry 4.0 and artificial intelligence, cybersecurity, energy and energy security, the dynamics of new globalization, political risk, the interrelationship between political stability and economic development, the Balkans, international trade and production, Cyprus, the Black Sea and regionalism, security, and global governance. Prof. AL has played a leading role in organizing numerous national and international congresses, workshops, panels, and academic events, facilitating collaboration among scholars and researchers both in Türkiye and abroad.

She has also supervised, and continues to supervise, numerous postgraduate theses, primarily in the field of International Political Economy. In 2015, she was appointed Head of the Department of International Political Economy at Marmara University. In 2017, she assumed the role of Vice Chair of the Department of International Relations. The following year, she was named Vice Dean of the Faculty of Political Sciences. In 2019, she earned the academic title of Associate Professor. From 2020 to 2023, she served as a member of the Faculty Board of the Faculty of Political Sciences. In February 2025, she was promoted to the rank of Full Professor in recognition of her academic contributions.

I would like to acknowledge that the editor's and publisher's guidance and expertise have been monumetally influential, while the support and belief in my work and manuscript kept me going.
In addition, the editor has a rare talent for making the book better and, in the same time, the constructive thoughts and reviews helped me improve my writing and made a lasting impact on my ideas.
The publisher's incredible dedication showed the belief in this project and, likewise, displayed the importance of investing in its quality.
Hence, I would highly like to congratulate the editor and the publisher for the succes of the book and I would like to show my deepest appreciation for a wonderful communication that was both engaging and inspiring.

Professor PhD. Habil. Cristina Raluca Gh.POPESCU
University of Bucharest

We believe that the publication of a series of monographs focusing on the political-economic aspects of the energy sector's development has significant theoretical and practical implications.
Energy resources are turning into a leading factor in supporting social life in the modern world. In turn, the development of energy generation technologies leads to a fundamental shift in power relations related to the control of energy distribution. The political-economic aspects of the study of the changes taking place acquire special importance in these conditions. The involvement Prof. Dr. Arzu AL. of a wide range of specialists researching different aspects and representing different countries, allows for significant improvement in its results and practical significance. Of particular value to the project is the participants' joint discussion of the results within the "virtual workshop" organized by Prof. Dr. Arzu AL.
I would like to wish the organizers of the project to continue their initiative, which is focused on the key problems of ensuring the sustainable development of humanity.

Prof. Dr. Andrii GRYTSENKO
Prof. Dr. Volodymyr LYPOV
National Academy of Sciences of Ukraine

Contributing to the first volume of Energy and Power in International Political Economy was a focused and productive experience. The editorial guidance was clear, which helped streamline the writing and sharpen the argument. I found the collaborative process efficient and academically engaging, especially in aligning my chapter with the broader themes of the book. The publication brought together diverse perspectives in a way that strengthened the overall scholarly value of the volume. It has also supported my own research by opening new angles on global energy politics. I appreciate the chance to share this reflection for the second volume and look forward to the continued development of the series

Asst. Prof. Dr. Munib KHALID
Minhaj University

Firstly, I would like to congratulate you on the success of your first volume. The basis of success is to follow the fundamental rule of Nature, which is balance, and you did it. At the heart of such issues as energy is the consumer, who must be taken into account to prevent exploitation and ensure that producers make profits within balanced limits. Typically, these types of publications focus on technology and governmental policy aspects without direct consumer involvement, ignoring ethical values. Therefore, the consumer is supposed to be responsible for electing the government; however, government policies often prioritize the interests of producers over those of consumers, thereby preventing unrest by manipulating people's minds through anti-educational methods. This situation exists worldwide, and it is time for people to be educated so that they support scientifically derived ethical values that strengthen the balance of Nature and do not allow others to disturb it.

Prof. Dr. John N. HATZOPOULOS
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