Chapter 10
Bridging Climate Risk, Energy Transition, and Financial Market Resilience:
A Comparative Analysis Across Income Groups

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ABSTRACT

This chapter bridges the gap by analyzing climate vulnerability, energy transition policies, and financial market implications across income groups using the 2022 Climate Risk Index (CRI), population, GDP per capita, and carbon pricing instruments. Results show an inverse relationship between GDP per capita and climate risk: high-income countries such as the United States, Germany, and France record

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lower CRI scores due to resilience, strong institutions, and mitigation capacity, while low- and lower-middle-income nations like Pakistan, Bangladesh, and Niger face heightened risks from limited adaptive capacity. Population amplifies vulnerability in densely populated countries, though not uniformly. Carbon pricing analysis reveals robust systems in advanced economies compared to limited adoption in vulnerable nations. By linking CRI with policy readiness and financial stability, the chapter highlights structural inequities and offers recommendations for strengthening resilience, incentivizing low-carbon investment, and safeguarding markets against escalating climate risks.

1. INTRODUCTION

Climate change has emerged as one of the most pressing challenges of the twenty-first century, reshaping the dynamics of economies, financial markets, and energy systems on a global scale. Its impacts are multifaceted, ranging from extreme weather events, rising sea levels, and intensifying heatwaves to wide-ranging regulatory and policy shifts aimed at curbing greenhouse gas emissions. These risks extend beyond environmental damage, exerting profound influence on economic development, investment patterns, and the stability of global financial markets. The study emphasizes that climate risks are systemic and interconnected, affecting not only the environment but also economic stability and financial market performance. For governments, firms, and societies alike, resilience against climate-related risks has become a critical determinant of long-term sustainability and stability (Pfenninger et al., 2014).

Scholars and policymakers increasingly emphasize the dual nature of climate risks: physical and transition. Physical risks stem from the direct consequences of climate events, including floods, storms, droughts, and temperature extremes, which can devastate infrastructure, disrupt production and supply chains, and impair local economies. Transition risks, in contrast, arise from the structural changes required to shift toward low-carbon energy systems. These include carbon pricing instruments, regulatory changes, technological advancements in renewables, and evolving investor preferences for sustainable assets. While extensive literature has examined physical and transition risks separately, much less attention has been paid to their interplay—yet in reality, these risks rarely operate in isolation. Their interaction often amplifies uncertainty, creating systemic challenges for economies and markets worldwide (Swart, 2019).

A cross-country perspective is particularly important in understanding these dynamics. Nations differ significantly in their exposure to climate hazards, institutional preparedness, and economic capacity to adapt. High-income countries gen-