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Inclusive Finance in the Digital Era

Bridging Climate Goals and Financial Access

Durmuş Çağrı Yıldırım, Seda Yıldırım, and Vinay Kandpal



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Leveraging Blockchain Technology for Transparent Financial Reporting in Circular Economies: Enhancing Accountability and Sustainability

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Abstract

The financial reporting in a circular economy (CE) is expected to be implemented through blockchain technology to achieve accurate, transparent and accountable, and sustainable. In the context of a CE, which is more conscious and deliberate about measuring financial benefits beyond shareholder value due to its focus on stewardship towards natural assets, this chapter provides a strategy highlighting when and where blockchain could be used for financial reporting. This chapter seeks to identify the mechanisms to operationalize blockchain for financial reporting and review the prospective advantages as well as constraints from such a transition and pitch potential new frontiers that would equip CE to better provision sustainability.

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Transitioning to a sustainable economy is essential to achieving the UN's SDGs by 2030. Green financing, a cornerstone of this shift, is influenced by interest rates. This study employs dynamic programming to develop a climate hazard timing model, linking environmental performance to interest rates. Findings suggest monetary authorities should widen the gap between green bond and conventional interest rates during environmental shocks to boost green financing's feasibility. A novel environmental elasticity metric quantifies disparities in interest rates relative to global climate risks. Using fuzzy logic, the study assesses global climate risk (GCR) for 175 countries (2000–2019), identifying Qatar as most and Puerto Rico as least vulnerable. Results show 38.3% of countries face low, 28% moderate, and 33.7% high vulnerability. Recommendations include interest rate adjustments based on climate risk levels, crucial for economic unions like BRICS and the EU.

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Ananya Pandey, Christ University, Bangalore, India

Jipson Joseph, Christ University, Bangalore, India

With emerging trends in industrialization, the globe is facing a rise in greenhouse gas emissions leading to extreme change in climatic conditions. Several connected issues such as melting of glaciers and increase in the level of greenhouse gas emissions are affecting the environment sustainability. The mitigation and adaptation of change in climatic conditions have become the need of the hour. Climate finance is the solution to these problems. Global climate finance in 2021–2022 was approximately \$1.3 trillion annually. But much more is required to limit global temperature increases to 1.5°C. The challenge of fulfilling global climate financing needed to enable adaptation plans and lower carbon emissions to sustainable levels

is one of the significant discussions in the multilateral arena. In this perspective, the chapter analyzes the current actions and movements related to climate finance. The exploration of international, regional, and national instruments of climate finance have been significantly highlighted.

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Amit Kumar, Christ University, India

Green banking 5.0, a modern concept in the financial industry, involves integrating environmental and social considerations into traditional banking practices. This chapter explores the structure of green banking and products. A sample of 20 Indian banks, 10 private sector and 10 public sector banks, will be used for analysis. Financial statements, annual reports, and Reserve Bank of India bulletins for the 2022-2024 period will be taken into consideration, assessing the impact of sustainability on profitability by taking key variables such as corporate social responsibility (CSR) funds, non-performing loans (NPLs), ATM installations into account to assess their impact on bank performance, measured by return on assets (ROA). It also examines how the RBI is guiding banks towards this greener path. The findings offer valuable insights for policymakers, investors, and banks seeking to navigate the evolving landscape of sustainable finance. This chapter contributes to a deeper understanding of the role of green banking in shaping the future of banking sector in India.

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Otilia Manta, Romanian Academy, Romania

This study examines the relationship between digital financial innovation (DFI) and financial resilience in Sri Lanka's banking sector. As institutions increasingly adopt DFI, understanding its impact on resilience is essential. The research analyzes key innovations, including artificial intelligence (AI), machine learning (ML), blockchain technology, mobile and embedded devices, and a composite DFI measure. Using a rigorous methodology, the study tests four hypotheses. Findings indicate that blockchain, mobile embedded devices, and digital financial technology positively influence financial resilience, while AI and ML show no significant relationship. Moreover, awareness and education play a crucial role in DFI adoption. These insights

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Reepu, Chandigarh University, India

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Sanjay Taneja, Graphic Era University, India

Anuradha Jain, Vivekananda Institute of Professional Studies, India

The current decade has witnessed sustainable growth in financial inclusion in India. Due to the continued awareness created among individuals, the nation has seen a significant development in opening bank accounts and using digital services to make financial decisions. The construction of an inclusive financial industry offers two advantages that are complementary to one another. Initially, those excluded from the market may be connected to economic progress through implementing financial inclusion. In the second place, the economy's expansion has introduced new people to financial digital services. These new banking models include payment banks for those who do not have bank accounts, microbanks, and mobile money services. In tandem with the proliferation of non-banking technology companies competing for a larger share of the banking value chain, the concept of financial inclusion has evolved to encompass a broader range of individuals.

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Renu Lamba, Punjab University, India

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Finance plays an important role in the economic growth of the nation and its overall development. It has been time and again proved that economic growth and prosperity go hand in hand in any economic system. Financial inclusion refers to the inclusion of excluded in the formal financial institution. Financial inclusion involves expanding the access of underserved segments to the financial system at an affordable cost. The phenomenon of financial inclusion has indeed emerged from the earlier conceptions of simple socially inclusive efforts to being a viable tool for financial and economic integration as well. It includes in its definition the possible entree, easy accessibility, and convenient procedure of the affordable and regulated monetary system by numerous cross segments of the society transversely the layout of the country.

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M. Thamizhselvi, NSB Academy, Bangalore, India

Ratnakar Mishra, Graphic Era University, Dehradun, India

Veto Dey, The Oxford College of Business Management, Bangalore, India

Blockchain technology has gained significant traction across the globe, with India emerging as a growing hub for its application. At its core, blockchain is a decentralized, distributed ledger that records transactions across multiple computers. The immutability and transparency of blockchain make it particularly attractive for various industries, especially when integrated with smart contracts. These self-executing contracts, coded onto the blockchain, automatically enforce the terms of an agreement without the need for intermediaries. This chapter explores the significance of blockchain in India, its major applications, advantages, challenges,

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Vivek Verma, Graphic Era University, India

Praveen Singh, Graphic Era University, India

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Disruption and uncertainty have attracted the attention of stakeholders towards insurance in the current geo-political era. Sustainability has emerged as the key concern for policy makers, corporates, and customers. The chapter attempts to explore the awareness of insurance among college students for sustainability. The Scopus database was used for bibliometric analysis. Five hundred sixty-eight documents were obtained from Scopus database. US leads the research on awareness about insurance products among college students. Health insurance was the prominent area of study. AI has emerged as the potential source of enhancing access of insurance. Re-insurance impacts the sustainability of insurance firms. MNC's are facing concerns about sustainability. ESG framework is needed to strengthen the sustainability of insurance. There is a need to explore health literacy awareness in different parts of the world to develop sustainable solutions.

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Preface

Digitalization and sustainability have become the main themes discussed together. Digital technologies are a great support force in the development of sustainable policies and strategies. At this point, digital transformation and sustainability in the financial sector have become a prominent topic. The purpose of this book is to collect and present reviews and original studies that address digital transformation in the financial sector and evaluate it in terms of sustainability. The book brings together various studies from international researchers and experts.

In this edited volume, *Inclusive Finance in the Digital Era: Bridging Climate Goals and Financial Access*, we aim to collect original, and review studies related to sustainable finance, insurance and sustainability policies and digitalization.

Chapter 1: A Dynamic Fuzzy Climate Hazard Timing Model for Regulating Green Finance

Transitioning to a sustainable economy is essential to achieving the UN's SDGs by 2030. Green financing, a cornerstone of this shift, is influenced by interest rates. This study employs dynamic programming to develop a climate hazard timing model, linking environmental performance to interest rates. Findings suggest monetary authorities should widen the gap between green bond and conventional interest rates during environmental shocks to boost green financing's feasibility. A novel environmental elasticity metric quantifies disparities in interest rates relative to global climate risks. Using fuzzy logic, the study assesses global climate risk (GCR) for 175 countries (2000–2019), identifying Qatar as most and Puerto Rico as least vulnerable. Results show 38.3% of countries face low, 28% moderate, and 33.7% high vulnerability. Recommendations include interest rate adjustments based on climate risk levels, crucial for economic unions like BRICS and the EU.

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As editors, we would like to thank all our authors who collaborated internationally and hope that our book will be useful.

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We would like to thank the authors and referees who supported us in the hope that this book will contribute to the green economy and sustainable development literature and provide useful information to researchers and readers. Since the responsibility of the book chapters belongs to the corresponding author and co-authors of each chapter, you can contact the chapter authors for information.

Chapter 7

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ABSTRACT

The financial reporting in a circular economy (CE) is expected to be implemented through blockchain technology to achieve accurate, transparent and accountable, and sustainable. In the context of a CE, which is more conscious and deliberate about measuring financial benefits beyond shareholder value due to its focus on stewardship towards natural assets, this chapter provides a strategy highlighting when and where blockchain could be used for financial reporting. This chapter seeks to identify the mechanisms to operationalize blockchain for financial reporting and review the prospective advantages as well as constraints from such a transition and pitch potential new frontiers that would equip CE to better provision sustainability.

INTRODUCTION

Caring for the concept of Circular Economies (CE) as a new economic paradigm, highlighting sustainability and resource efficiency (Yildirim & Yildirim, 2020). Reinforcing traditional linear economies that are “take-make-dispose” with a closed-loop system of reusing, recycling, or regenerating resources is the quintessence of circular economies. This shift in paradigm came because of the very timely necessity to combat environmental deterioration, depletion of resources and climate changes, which pushed businesses and governments to rethink their ways (Carvajal and Nadeem, 2022; Xie et al., 2020; Rehman et al., 2022a). The evolving demand for sustainability from business administration exemplifies the importance of transparency and responsibility in financial reporting (Aysan et al., 2021; Ertz, 2021) stakeholders require deep insights into the environmental and social consequences of corporate activities.

In this respect, sustainability goes beyond just regulatory compliance in the financial statements but becomes a strategic management mandate for enhancing corporate reputation and stakeholder confidence. Where organizations are trying to better align with circular economies' principles, the value-added is considerable, both in having robust and transparent financial reporting mechanisms. The sustainability practices of corporate entities are particularly relevant here, as they are increasingly in the spotlight of investors, consumers, and regulatory bodies (Harymawan et al., 2020; Tilakasiri, 2023, Yildirim, 2022). Hence, the challenge for sustainable practices is that it is not limited to just financial indicators only Schiehl & Kolahgar, 2020; Alshehhi et al., 2018).

Financial reporting within a circular economy about transparency and accountability issues, but also it blockchain technology provides an excellent solution. This itself makes the project a reliable financial data availability for anyone careful

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Arsalan Haneef Malik is an academician and experienced professional in accounting and finance. He is affiliated with the Institute of Business Management (IoBM) Karachi, Pakistan. With a PhD from the University of Malaysia Sarawak, he has published extensively in the social sciences in highly reputed journals. Among his research areas are financial inclusion, financial stability, institutional quality, and environmental and social sustainability. He inspires and mentors students to think critically and apply their knowledge to real-world situations. Arsalan Haneef Malik is committed to academic excellence and shaping the next generation of financial professionals.

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