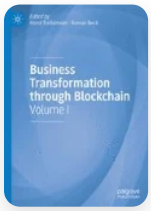
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Blockchain Economic Networks: Economic Network Theory—Systemic Risk and Blockchain Technology

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Business Transformation through Blockchain

Melanie Swan

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Abstract

This chapter discusses how the widespread adoption of blockchain technology (distributed ledgers) might contribute to solving a larger class of economic problems related to systemic risk, specifically the degree of systemic risk in financial networks (ongoing credit relationships between parties). The chapter introduces economic network theory, drawing from König and Battiston (2009). Then, Part I develops payment network analysis (analyzing immediate cash transfers) in the classical payment network setting (Fedwire (Soramäki 2007)) synthesized with the cryptocurrency environment (Bitcoin (Maesa 2017), Monero (Miller 2017), and Ripple (Moreno-Sanchez et al. 2018)). The key finding is that the replication of network statistical behavior in cryptographic networks indicates the robust (not merely anecdotal) adoption of blockchain systems. Part II addresses balance sheet network analysis (ongoing obligations over time), first from the classical sense of central bank balance sheet network analysis developed

by Castrén (2009, 2013), Gai and Kapadia (2010), and Chan-Lau (2010), and then proposes how blockchain economic networks might help solve systemic risk problems. The chapter concludes with the potential economic and social benefits of blockchain economic networks, particularly as a new technological affordance is created, algorithmic trust, to support financial systems.

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Author information

Authors and Affiliations

Purdue University, West Lafayette, IN, USA
Melanie Swan

Corresponding author

Correspondence to Melanie Swan.

Editor information

Editors and Affiliations

Department of International Management, MODUL University Vienna, Vienna, Austria

Horst Treiblmaier

Head of European Blockchain Center, IT University of Copenhagen, Copenhagen, Denmark

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