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Feature Articles

This month's focus: Social Network Analysis

Social Network Analysis: An Overview

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This article outlines the framework of network science and the foundations of social network analysis. Rapidly developing since around 2000, network science provides data analysis methods and mathematical models now widely utilized across the social and natural sciences. Focusing particularly on socio-economic networks, this article introduces these analytical methods and highlights key insights from the network science literature.

Network Research in Accounting and Finance: A Review and Key Challenges

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This article reviews the major research areas and methodological developments in network research in the fields of accounting and finance. It surveys studies on interpersonal ties involving directors, auditors, and analysts, as well as equity ownership and supply chain relationships, and discusses challenges related to endogenous network formation and causal identification. It then discusses the respective roles of conditional uniform graph tests, exponential random graph models, and hypergraphs. Using common ownership as an example, this article discusses how the choice of units of analysis and network representations should align with the research question and the underlying economic mechanisms.

The Expansion of the Market for Outside Directors and the Structure of Board Interlocks in Japan

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The number of outside-director seats at Japanese listed companies grew 2.4-fold between 2015 and 2026. Using board interlock networks constructed from the annual securities reports filed on EDINET at 13 annual snapshots (2014-2026), this article describes who filled these seats and how the interlock structure changed as a result. Two findings stand out. First, more than half of newly appointed outside officers (outside directors and outside corporate auditors) had not been observed as an officer of any listed company in the preceding five years, so entry from outside the pool of listed-company officers has continued. Appointments that involve an existing tie, such as a former board colleague or prior service at the same firm, occur far more often than under random matching, but together they account for only about one tenth of new appointments.

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Second, in every year since 2019 the largest connected component of the outside-officer layer has been smaller than expected under a null model that preserves each person's number of outside seats and each firm's number of outside officers. Observable attributes such as industry and region do not explain this shortfall. The observed non-random matching provides a basis for investigating channels that do not appear in officer data. Multi-board holding among women rose markedly while that among men stayed flat, indicating that part of the demand for female directors was absorbed by additional seats held by the same individuals. The article proposes three indicators that can be tracked annually from public disclosures: the share of first-time entrants among new appointees, each firm's number of connections in the outside-officer layer, and the multi-board intensity of women directors.

Financial Networks and Risk Contagion

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Financial systems consist of interconnected banks, corporations, insurance companies, and other financial institutions linked through a variety of financial relationships, including interbank lending, corporate lending, shareholdings (including cross-shareholdings), syndicated loans, credit default swaps, and reinsurance. These linkages facilitate the allocation and transfer of funds and risks, but may also serve as channels through which financial distress propagates across institutions and markets. This article provides an overview of financial network analysis, with particular emphasis on the relationship between network structures and the transmission of credit and systemic risks. It first classifies representative financial networks in terms of their nodes, edges, directionality, and structural features, and discusses how the direction of financial exposures may differ from that of shock propagation. It then explains how centrality measures and network-based contagion analysis can be used to identify systemically important institutions and potentially vulnerable structures. Drawing on empirical studies of interbank, corporate lending, syndicated loan, shareholding, CDS, and reinsurance networks, the article shows that greater interconnectedness does not necessarily imply greater systemic risk. Whether interconnectedness amplifies or disperses risk depends on the concentration and distribution of exposures, the positions of individual institutions within the network, and the mechanisms through which shocks propagate. The article further reviews recent developments in financial network research, including multilayer networks, endogenous network formation and credit freezes, integrated network stress testing, and the extension of network analysis to supply-chain and climate-related risks. Finally, it discusses the continuing empirical challenge posed by the limited observability of bilateral exposures and the resulting need for network reconstruction. Financial network analysis provides a useful framework for bridging the assessment of individual credit risk and systemic risk by identifying not only the sources of shocks but also the channels through which those shocks may be amplified or absorbed.
