
BICM Research Seminar 18

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| Paper details | |
|-----------------------------|---|
| Title | Non-Random Topology in Bangladeshi Stock Market |
| Authors | Sujoy Das Managing Director, HNK Systems (Pvt.) Limited |
| | Dr. Md. Saidur Rahman Professor, Department of Computer Science and Engineering, BUET |
| Presentation details | |
| Presenter researcher | Sujoy Das |
| Date: | November 28, 2022 (Monday) |
| Time: | 11:00 AM - 12:30 PM |
| Venue: | BICM Multipurpose Hall |
| Expected Participants | Faculty Members of BICM & Invited Guests |
| Discussants | Dr. Shaheena Sultana Associate Professor, Department of Computer Science and Engineering Notre Dame University, Bangladesh |
| | Md. Manzurul Hasan Associate Professor, Department of Computer Science and Engineering American International University-Bangladesh (AIUB) |

About the presenter

Sujoy Das is a Bangladesh-based Computer Scientist and Software Engineer. He has completed his B.Sc. and M.Sc. in Computer Science and Engineering from Computer Science and Engineering Department, Bangladesh University of Engineering and Technology (BUET). He is now pursuing his PhD research at Computer Science and Engineering Department, BUET. In professional life, he is a business organizer and entrepreneur. He has 15 years of experience in Bangladesh Software and IT industry. He has worked with various public sector as well as private sector bodies to automate and digitize many scenarios. He has vast experiences on requirement analysis, system analysis, process re-engineering and change management. He has also hands on experience in financial engineering both academically and professionally. He has got several international as well as national awards for his research works. He is now working as the Managing Director, HNK Systems (Pvt.) Limited.

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The paper abstract is given below. If you have any questions regarding the seminar or you wish to present a paper or invite a guest researcher, please do not hesitate to communicate S. M. Kalbin Salema, Lecturer, BICM at kalbin@bicm.ac.bd.

Non-Random Topology in Bangladeshi Stock Market

Sujoy Das¹
Dr. Md. Saidur Rahman²

Abstract

Stock market is a very important component of financial system. People come here to invest and to be benefited. But no investment is fully risk-free in this world. Stock markets around the world usually go up and down without having clear patterns. In a stock market, no stock can be evaluated and appreciated independently. Stocks of various listed companies are compared among themselves to be evaluated and appreciated. The price of each stock is correlated with the prices of other stocks. Due to such price correlation, a network is formed among the stocks. Each stock is a node of the network and the correlation coefficient between two stocks is the weight of the edge between them. Such an underlying weighted network of stock market is called price correlation network. Some graph theoretic properties of the price correlation network can give valuable insight regarding the stability of the stock market as well as the investors' safety. Again, various systemic risks of stock markets like fatal market crash, volatility, structural entropy etc. can be efficiently minimized by modeling the risk minimization problems as graph algorithmic problems. Network topology can shed light on risk minimization process. In this research work, we have explored various graph theoretic properties of the underlying price correlation network of Bangladesh stock market. From our experiment, we have found that the underlying price correlation network of Dhaka stock exchange has non-random topology. The node degree distribution of the price correlation network follows the power law distribution. It indicates that the stated market is able to tolerate random attacks. It also indicates that if the dynamics of the high degree nodes are monitored carefully, targeted attacks can also be avoided in larger extents. Thus, our work can help both the regulatory authorities and the investors in financial decision making. It will help to properly understand the adaptive dynamical phenomena of Bangladesh stock market. In this research work, we have conducted our experiment on Dhaka Stock Exchange trading dataset of year 2015, 2016 and 2017.

Keywords: Graph, Complex Network, Topology, Stock Market, Price Correlation Network

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