

BICM Research Seminar 59

We cordially invite you to join our research seminar and contribute to share academic excellence. Please note the following specifics about the upcoming seminar.

Paper details	
Title	Explainable AI-Driven Federated Learning for Privacy-Preserving Stock Market Forecasting in Bangladesh
Authors	Dr. Mohammad Sahabuddin Associate Professor Department of Business Administration Daffodil International University
	Dr. Mohammad Zoynul Abedin Senior Lecturer in Finance (FinTech) Swansea University
	Imran Mahmud Lecturer Bangladesh Institute of Capital Market
Presentation details	
Presenter researcher	Imran Mahmud
Date	13 September 2026 (Sunday)
Time	11:30 AM – 12:30 PM
Venue	BICM Multipurpose Hall
Expected Participants	Faculty Members of BICM & Invited Guests
Discussants	Dr. Md. Rajibul Islam Chairman and Associate Professor Department of Data Science and Engineering Bangladesh University of Business and Technology
	Md. Nayem Dewan Deputy Director (Statistics) Bangladesh Bank

About the Presenter

Mr. Imran Mahmud serves as a Lecturer at the esteemed Bangladesh Institute of Capital Market (BICM) under the Ministry of Finance. He holds an MBA and BBA in Finance from the distinguished Department of Finance at the University of Dhaka, where he excelled academically and was awarded the Dean's Merit Award in recognition of his outstanding achievements. Additionally, Mr. Mahmud has successfully passed CFA Level 1 and CFA Level 2 and is actively pursuing the last level of this prestigious professional certification. He is also pursuing an MSc in Data Science and Analytics from East West University. Having embarked on his professional journey as a Lecturer of Finance in the Department of Business Administration at Notre Dame University Bangladesh, Mr. Mahmud later assumed a pivotal role as a Lecturer at BICM, further honing his expertise in the field of finance. His contributions to the field are evident through the publication of nine research papers, focusing on various aspects of the country's capital market and machine learning, both in national and international journals. Mr. Mahmud's engagement with the CFA program and his extensive research endeavors have equipped him with in-depth knowledge of diverse facets of capital markets, including equity and debt markets, IPOs, bonds, derivatives, and investment banking.

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 contact S. M. Kalbin Salema, Assistant Professor, BICM at kalbin@bicm.ac.bd.

Explainable AI-Driven Federated Learning for Privacy-Preserving Stock Market Forecasting in Bangladesh

Dr. Mohammad Sahabuddin¹, Dr. Mohammad Zoynul Abedin² & Imran Mahmud³

Abstract

Accurate forecasting of stock market indices is essential for investors, portfolio managers, and policymakers to make informed decisions in dynamic financial markets. However, centralized forecasting models often struggle to generalize across heterogeneous market segments, while complex deep models provide limited transparency concerning the factors underlying their predictions. This study proposes FedStockBD, an explainable, multi-architecture federated deep learning framework for forecasting major Bangladesh stock market indices, including the Dhaka Stock Exchange Broad Index (DSEX), Dhaka Stock Exchange 30 Index (DS30), and Dhaka Stock Exchange Shariah Index (DSES). The framework employs FedAvg and FedProx optimization to enable collaborative training across heterogeneous financial datasets, addressing non-IID data distributions. Five deep learning models are evaluated to capture diverse temporal and structural patterns. To make their forecasts explainable, the final global models are analyzed using SHapley Additive exPlanations (SHAP), Local Interpretable Model-agnostic Explanations (LIME), and ELI5. SHAP quantifies global and local feature effects, LIME explains individual forecasts through local surrogate models, and ELI5 provides an independent global feature-importance assessment. Experimental results demonstrate strong forecasting performance: FedProx-1D-CNN achieves an MAE of 117.0107 on DSEX, FedProx-MLP attains 48.0339 on DS30, and FedProx-1DCNN obtains 27.3421 on DSES. These results show that federated optimization can deliver both accurate and explainable forecasting for emerging stock markets.

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