# Macroeconomic Determinants of Stock Market Dynamics in Japan and South Korea: An Explainable Machine Learning Approach[†]

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**ABSTRACT**

This study examines the macroeconomic determinants of stock market movements in Japan and South Korea, two advanced Asian economies that are increasingly integrated yet structurally distinct. Using quarterly data from 1995 to 2024, the analysis combines econometric methods with an explainable machine-learning framework—LASSO, Random Forests, and SHAP values—to identify key macroeconomic drivers and their time-varying effects on stock prices.

The results show that both the TOPIX and the KOSPI are strongly shaped by global factors, particularly the VIX and commodity prices such as copper and oil. The rising importance of copper, confirmed across models and SHAP decompositions, indicates increasing sensitivity to global industrial cycles. At the same time, structural asymmetries persist. In Japan, domestic liquidity and yen depreciation play major roles, while in Korea, external demand—proxied by world and U.S. GDP—and won appreciation are more closely linked to stock performance.

Rolling-window estimations further reveal that although Japan and Korea have moved together historically, their correlation has weakened in recent years, suggesting diverging responses to global and domestic shocks. Overall, the findings illustrate how globalization and policy divergence shape stock market dynamics in East Asia, with implications for investors seeking diversification and for policymakers monitoring financial spillovers. The consistency between the SHAP-based explanations and underlying economic intuition further suggests that explainable machine-learning methods can serve as a transparent and complementary tool for future stock market analysis.

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