

Short-Run Relationships Between Indonesia's Capital Market And BRICS Countries Using Granger Causality

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Abstract.

This study investigates the short-term causal relationships between Indonesia's capital market and the stock markets of BRICS countries, Brazil, Russia, India, China, and South Africa, using the Granger Causality Test on daily data from June 2023 to May 2025. Following Indonesia's formal membership in BRICS in January 2025, understanding these financial linkages becomes increasingly vital for portfolio diversification, risk management, and macroeconomic policy. The analysis reveals significant short-term causal interactions, particularly between the Jakarta Stock Exchange (JSX) and markets such as FTSEJSE (South Africa), BOVESPA (Brazil), MOEX (Russia), and SHANGHAI (China). South Africa emerges as a central transmitter of volatility, while Indonesia demonstrates both influence and sensitivity to BRICS markets. The findings highlight asymmetric integration within BRICS, indicating that while some markets exert predictive influence, others remain relatively independent in the short term. This research contributes to the literature by focusing on Indonesia's strategic role post-membership and offering practical insights for investors and policymakers. Recommendations include enhancing real-time cross-country market surveillance and further research incorporating macroeconomic variables and nonlinear models to assess long-term integration. The study underlines the growing interdependence among emerging markets in an era of intensified globalization.

Keywords: Granger Causality; BRICS; capital market integration; short-term relationship and Indonesia stock exchange.

I. INTRODUCTION

In the increasingly intense era of economic globalization, the integration of international financial markets has become a dominant feature shaping the dynamics of capital markets in various countries, including Indonesia. Globalization has spurred massive cross-border capital flows, affecting the stability and performance of domestic stock markets through volatility transmission and other external influences (Bal and Manglani, 2016). Amidst efforts by developing countries to enhance their investment competitiveness, the capital market has become a strategic channel for attracting both foreign direct investment and portfolio flows. Indonesia, as one of the largest economies in Southeast Asia, has shown significant development in its capital market infrastructure. Indonesia's membership in BRICS on January 6, 2025, further confirms its strategic position in the global financial ecosystem. This raises a new urgency to understand the extent of interconnection between Indonesia's capital market and those of BRICS countries. This is crucial because the capital market not only serves as an indicator of domestic economic development but also reflects a country's response to other countries' economic conditions (Yu et al., 2021). Although various studies have discussed global and regional stock market integration, there remains a relevant gap regarding the short-term causal dynamics between Indonesia's capital market and BRICS countries. Most previous studies focused more on Indonesia's stock market integration with major trading partners (Juliadi et al., 2024), developed countries (Saputra and Hendri, 2024), ASEAN countries (Robiyanto, 2017), or bilateral relations with specific countries such as China or the United States, without highlighting the causal structure within the comprehensive BRICS framework.

Yet, the dynamics between Indonesia's and BRICS countries' capital markets have significant implications for portfolio diversification strategies, systemic risk management, and the formulation of fiscal and monetary policies. Moreover, geopolitical conditions, commodity price fluctuations, and global interest rate policies have created new complexities in inter-market relationships, requiring deeper analytical approaches for market participants and policymakers (Mitra and Bhattacharjee, 2015; Qamruzzaman et al.,

2021; Quattara, 2017). Theoretically, this study is grounded in the modern portfolio theory developed by Markowitz in 1952 (Markowitz, 1991), which emphasizes the importance of diversification to reduce portfolio risk without sacrificing return expectations. This theory assumes that portfolio efficiency is achieved through cross-border asset allocation, as long as the stock markets are not fully positively correlated. Therefore, understanding the level of interdependence or market integration becomes crucial, particularly in the context of emerging markets like BRICS. In relation to the Granger Causality approach, short-term relationships between stock markets reflect information transmission mechanisms that investors can utilize in investment decision-making (Lam et al., 2023; Chvosteková, 2021). This approach is considered more appropriate than conventional correlation because it identifies the direction of relationships and predictive influence between capital markets in the short term. Based on the above context, the research question is:

What is the nature of the relationship between Indonesia's capital market and the capital markets of BRICS countries in the framework of short-term causality? This study aims to empirically determine the existence of short-term causal relationships between the Indonesian stock index and the stock markets of Brazil, Russia, India, China, and South Africa during the period from June 2023 to May 2025. A quantitative approach is employed, using the Granger Causality Test method based on daily time series data. The main focus of the research is to assess the pattern of transmission and direction of influence between these stock markets in the context of Indonesia's post-BRICS membership. The primary contributions of this article lie in three aspects of novelty. First, this study is among the first to specifically investigate the relationship between Indonesia's capital market and BRICS countries following Indonesia's official membership. Second, the use of Granger causality in this study allows for the identification of the short-term directional influence between Indonesia's stock market and the stock markets of other BRICS countries. Third, the findings of this study are expected to provide strategic insights into international portfolio diversification and strengthen the competitiveness of Indonesia's capital market within the dynamic BRICS ecosystem. Thus, this article not only enriches the academic discourse in international finance and investment but also offers practical contributions for policymakers and market players in emerging markets.

II. LITERATURE REVIEW

The primary theory underpinning this study is the modern portfolio theory introduced by Harry Markowitz in 1952. This theory emphasizes the importance of portfolio diversification as a strategy to reduce investment risk without lowering return expectations (Mitra and Bhattacharjee, 2015). In the context of international capital markets, cross-country diversification becomes key to forming an optimal portfolio, especially when returns across markets are not fully correlated. This theory gains even more relevance when associated with the phenomenon of capital market integration, which refers to the degree of interlinkage between stock markets affecting diversification effectiveness. When stock markets are highly integrated, the benefits of diversification decrease (Kearney and Lucey, 2004; Quattara, 2017). Hence, understanding the extent of causal relationships among stock markets is crucial for assessing portfolio diversification opportunities and global financial stability. Numerous previous studies have explored Brics market integration using various approaches. For example, Yu et al. (2021) investigated return linkages between China's stock market and other Brics markets using VAR and Granger causality, finding that China's market is influenced by other BRICS markets.

Similarly, Qamruzzaman et al. (2021) found cointegration among BRICS markets and Granger causality between markets such as Brazil and South Africa, and Brazil and India. They noted that China only influenced South Africa, whereas it was otherwise influenced by other BRICS markets. On the other hand, Jain (2014) identified dynamic Granger causality relationships during global crises, noting that causal links from Brazil to China and from Russia to China did not exist pre-crisis but emerged post-crisis. Tripathy (2015) also found cointegration among BRICS markets but no Granger causality involving China's market. Similarly, Krishnegowda (2023) found limited Granger causality within BRICS despite overall integration, with no Granger causality observed between South Africa and Brazil, South Africa and China, or China and Russia. Despite many studies examining BRICS integration, a literature gap remains regarding the causal

relationships between Indonesia's capital market and BRICS countries, especially following Indonesia's official membership in 2025. Most research focuses on core BRICS members and excludes Indonesia. This study strategically fills that gap by explicitly analyzing the short-term causal relationships between Indonesia and BRICS markets. By applying the Granger Causality Test to daily data over the last two years, it contributes to global financial integration discourse from the perspective of a newly joined emerging market.

It also expands the analytical base beyond correlation and cointegration studies by incorporating predictive directionality across markets, which is vital for investment decision-making, risk management, and macroeconomic policy formulation. Methodologically, previous studies employed econometric methods such as Johansen cointegration, VECM, VAR, and spillover indexes (Haddad, 2023). However, Granger causality remains relevant for evaluating short-term relationships with explicit directional insights. Conceptually, this study places modern portfolio theory at its core, explaining the rationale for cross-border diversification. This underscores the need for a deeper understanding of inter-market relationships to define optimal investment strategies. By applying a temporal and predictive Granger causality framework, this article builds an empirical foundation for understanding the short-term relationships between Indonesia and BRICS stock markets, thus contributing to contemporary investment and international finance literature.

III. METHODS

This research employs a quantitative approach with a Granger causality analysis strategy to identify short-term relationships between Indonesia's and BRICS countries' (Brazil, Russia, India, China, and South Africa) stock markets. This strategy was selected due to Granger causality's strength in detecting directional influence between time series variables, making it relevant for evaluating dynamic linkages in international financial integration. The study is explanatory, aiming to uncover causal patterns between stock indices across BRICS countries within a specific timeframe. Secondary data in the form of daily time series of stock indices were used, covering Indonesia (Jsx), Brazil (Bovespa), Russia (Moex), India (Nifty50), China (Shanghai), And South Africa (Ftsejse) from June 2023 to May 2025.

Data were sourced from <https://id.investing.com>, which provides historical global stock index data. Daily data were selected to capture market dynamics more sensitively to global and domestic information fluctuations. All data processing was conducted using EViews 12, a statistical software capable of performing unit root and Granger Causality Tests systematically. The primary analytical technique used was the Granger Causality Test, conducted after ensuring data stationarity. A unit root test was performed using the Cross Sectionally Independent Individual Root-Fisher-ADF test method with the Akaike Information Criterion.

IV. RESULTS AND DISCUSSION

Granger causality analysis results showed that Indonesia's capital market (JSX) had significant short-term relationships with several BRICS stock markets. The test, using daily data from June 2023 to May 2025, confirmed stationarity before implementation. Of the 12 relationship combinations, six demonstrated statistically significant causality at the 5% level. The strongest causal relationship was from Ftsejse (South Africa) to Bovespa (Brazil), with an F-statistic of 13.9782 and a near-zero probability, indicating South Africa's stock market as a major information transmission source across BRICS. This aligns with Yu et al. (2021), though they identified a bidirectional relationship. Conversely, Jain (2014) found causality from Brazil to South Africa. Other studies (Quattara, 2017; Krishnegowda, 2023) reported no Granger causality involving South Africa and other BRICS markets. JSX also significantly influenced Bovespa (F-statistic: 2.66915; Prob. = 0.0471), reflecting Indonesia's growing role in Latin American market dynamics, especially after joining BRICS. This underscores Indonesia's strengthening position in global market directions and South-South economic relations. Ftsejse also had a significant influence on JSX (F-statistic: 5.07507; Prob. = 0.0018), indicating South Africa's stock market as a predictor for Indonesia.

This may be due to shared risk profiles, commodity exposure, and strategic roles within Brics. Ftsejse also influenced Moex (Russia) and Nifty50 (India), with probabilities of 0.0038 and 0.0000, respectively, demonstrating South Africa's unique position in financial information flows. Jain (2014) and Qamruzzaman et al. (2021) similarly reported unidirectional causality from South Africa to these

markets.JSX's influence on Moex was also significant (F-statistic: 4.92344; Prob. = 0.0022), possibly reflecting global institutional investors channeling funds simultaneously into Brics countries or sectoral volatility spillovers.Shanghai significantly influenced JSX (Prob. = 0.0008), emphasizing China's dominant role in regional economic and financial structures, and its close trade and investment ties with Indonesia.No significant causality was found among the following: Moex → Bovespa, Shanghai → Bovespa, Shanghai → Ftsejse, Nifty50 → Jsx, Nifty50 → Moex, Shanghai → Moex, And Shanghai → Nifty50. These gaps suggest not all BRICS markets influence each other directly in the short term, possibly due to capital flow limitations, regulatory differences, or strong domestic factors.Overall, BRICS stock market integration appears asymmetric, with South Africa acting as a central influence and Indonesia increasingly significant post-BRICS membership. These findings highlight the need to monitor inter-market dynamics for cross-border investment risk management and global financial policy formulation. In the short term, portfolio diversification opportunities remain viable among certain Brics stock markets.

V. Conclusion and Recommendations

This study confirms significant short-term causal relationships between Indonesia's capital market (JSX) and several BRICS markets, notably South Africa (Ftsejse), Brazil (Bovespa), Russia (Moex), and China (Shanghai). The Granger Causality Test applied to daily stock index data from June 2023 to May 2025 revealed both inbound and outbound influences involving JSX, indicating asymmetric interactions. South Africa's prominent influence highlights its role as a volatility transmission hub in emerging markets, while China's influence on JSX underscores strong bilateral economic ties.JSX's influence on Bovespa and Moex illustrates Indonesia's emerging strategic role in BRICS market networks. These findings have important implications for portfolio diversification and financial policymaking. For institutional and individual investors, this highlights the need to account for Brics market dynamics—especially South Africa and China—in asset allocation strategies.

The existence of significant causal links indicates potential shocks from these markets can impact Indonesia, making risk mitigation strategies like hedging or portfolio rebalancing vital.For financial regulators, these findings empirically support that Indonesia's capital market stability is influenced not only by domestic factors but also by global dynamics within BRICS. Thus, adaptive macroprudential policies and enhanced early warning systems are essential.Further recommendations include developing real-time, integrated cross-country market monitoring systems to accelerate policy responses to external shocks. Governments and financial authorities should strengthen cooperation with BRICS members in market surveillance, regulatory standardization, and financial information transparency. Future research should include macroeconomic variables like exchange rates, interest rates, and trade volumes, and examine long-term integration using panel cointegration and nonlinear models. Comparative studies before and after Indonesia's BRICS membership would also be valuable in assessing institutional and policy impacts on financial integration.

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