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Article

Impact of Financial Reporting Quality on Liquidity Synchronization: Evidence from BRICS Countries

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Abstract

The main objective of the current study is to examine the relationship between financial reporting quality and liquidity synchronization within the BRICS countries. The BRICS countries include Brazil, Russia, India, China, and South Africa. When firms maintain high financial reporting quality, transparency improves, information asymmetry decreases, market efficiency increases, and ultimately both firm-level liquidity and overall market performance improve. This study uses panel data from 2012 to 2023, covering publicly listed firms in the BRICS countries. The Fully Modified Ordinary Least Squares (FMOLS) technique is employed to examine the relationship between financial reporting quality and liquidity synchronization. Liquidity synchronization refers to the extent to which an individual stock moves in tandem with overall market movements. Financial reporting quality is measured using accrual-based and earnings quality measures. The results indicate that firms with higher financial reporting quality exhibit lower liquidity synchronization. This suggests that firm-specific information is incorporated into prices more efficiently, thereby reducing the co-movement of individual stocks with the broader market. This study contributes to the literature by linking financial reporting quality to market microstructure in emerging economies. It also provides valuable implications for policymakers, regulators, and investors to enhance market stability and efficiency within the BRICS countries.

Keywords: financial reporting quality; liquidity synchronization; market microstructure; FMOLS techniques

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1. Introduction

Liquidity synchronization is a complex and critical phenomenon with significant implications for financial markets, particularly for investment decisions. Understanding the factors that influence liquidity synchronization is therefore essential for investors, portfolio managers, and policymakers to manage risk and make informed decisions (Domowitz et al., 2005; Kamara et al., 2008; Karnaukh et al., 2015). More specifically, liquidity synchronization helps managers mitigate the financial risks associated with transitioning to more sustainable practices. As businesses shift toward sustainability, they often face substantial upfront costs that can strain cash flows (Adrian & Shin, 2010). Liquidity synchronization refers to the alignment of cash flows and financial resources to support both immediate operational needs and long-term sustainability goals (Brockman et al., 2009; Karolyi et al., 2012).

Recently, a growing number of studies have highlighted that firms with effective liquidity synchronization are better equipped to invest in sustainable initiatives, maintaining the financial flexibility needed to pursue environmentally and socially responsible goals (Chordia et al., 2000; Dang et al., 2015; Meng & Zhao, 2022). More precisely, research underscores the delicate balance between financial stability and long-term environmental, social, and economic objectives (Karolyi et al., 2012; Acharya & Thakor, 2016; Aikman et al., 2011). At the firm level, liquidity synchronization is influenced by the extent to which stock prices incorporate firm-specific information (Baker & Stein, 2004; Koch et al., 2016).

Existing literature also emphasizes the critical role of creditors in monitoring and disclosing accounting information, which significantly impacts stock liquidity. During economic crises, investors often respond by withdrawing funds from equity markets or reallocating investments to safer assets, exacerbating stock liquidity problems due to panic-driven behavior (Clancy et al., 2019; Reis, 2013; Switzer & Picard, 2016). Thus, sustainable development requires both businesses and governments to incorporate sustainability into financial strategies and operations, ensuring that resources, particularly liquidity, are managed efficiently and responsibly (Jiang et al., 2021).

The relationship between liquidity synchronization and asset returns has been extensively studied. For example, Amihud and Mendelson (1986) and Brennan and Subrahmanyam (1996) showed that liquidity synchronization affects asset returns, either as a characteristic of the asset or as a risk factor. Institutional investors also play a crucial role in liquidity synchronization. Understanding the influence of institutional ownership on market outcomes is particularly important in the context of financial reporting quality, which significantly affects market liquidity (Vo et al., 2021). Additionally, liquidity synchronization is influenced by a country's institutional and financial development. High regulatory quality reduces information asymmetry, enhancing market stability and liquidity (Lee, 2011). Studies including Gill et al. (2010) and Gagnon and Karolyi (2009) argue that sound regulatory frameworks mitigate liquidity risk and boost investor confidence. Similarly, Beber et al. (2009) emphasize that high-quality financial reporting ensures access to reliable information, which is crucial for effective decision-making.

Liquidity synchronization also affects market behavior, investment decisions, and financial stability, yet these dynamics remain underexplored. The interaction between firm-specific determinants, sustainable development, and market efficiency is not yet fully understood. Moreover, integrating sustainability goals with effective liquidity management adds complexity that is largely unexamined in emerging economies (Benos et al., 2020). Research has largely overlooked the interplay between macroeconomic and firm-level factors in shaping liquidity dynamics. Although some studies have explored macroeconomic effects on liquidity synchronization, the influence of monetary policy and market efficiency on this relationship remains limited (Brockman et al., 2009; Buis et al., 2020).

It is also unclear whether fluctuations in market efficiency affect liquidity synchronization during periods of financial instability. Given the growing importance of liquidity synchronization in financial decision-making and the global shift toward sustainable business practices, a deeper understanding of these relationships is crucial. The lack of empirical evidence in the context of BRICS countries presents a significant gap, limiting stakeholders' ability to make informed decisions in these emerging markets (Brunnermeier & Pedersen, 2009). The study of liquidity synchronization has gained particular attention since the Global Financial Crisis (GFC) of 2007–2008. Traditional economic models often overlook systematic liquidity risk, but recent crises have highlighted its significance, especially regarding information availability. Liquidity synchronization and the pricing of liquidity risk directly affect portfolio diversification, as investors must evaluate risks carefully before entering new markets. Investors require compensation for liquidity synchronization, which represents a non-diversifiable systematic risk.

Despite its importance, the determinants of liquidity synchronization remain underexplored, with potential contributors including economic, financial, and institutional factors (Cespa & Foucault, 2014; Favero et al., 2010). To address these gaps, the current study makes four contributions. First, it focuses on BRICS countries, offering insights into how emerging and developed economies differ in managing liquidity synchronization and its impact on market behavior. Second, it clarifies the combined effects of financial reporting quality on liquidity synchronization. Third, comparing developed and emerging economies provides deeper insight into liquidity dynamics across different market conditions. The BRICS countries are particularly important due to their influence on global trade, investment patterns, and economic development, positioning them as key drivers of global financial trends (Chordia et al., 2005; Christensen & Gillan, 2018).

The findings provide valuable insights for policymakers and regulators to understand how liquidity synchronization shapes market behavior, with implications for financial markets, investment strategies, and policy formulation. Specifically, results indicate that Brazil's performance surpasses that of the other BRICS economies, while China shows relatively strong results, as reflected in a positive Gamma (liquidity synchronization) value, indicating higher economic growth volatility. The study also finds that markets with more liquid assets tend to adjust more slowly in internationally integrated financial markets. In Brazil, the results demonstrate a highly significant p-value, suggesting more effective financial market performance compared to other BRICS countries.

2. Literature Review

According to Spence (1973), signaling theory posits that economic agents use observable indicators to convey information about unobservable qualities. In the context of financial markets, when a country or its stock market exhibits high levels of liquidity synchronization, it signals to investors that the country's economic conditions are strong. This perception often leads to higher stock market returns and improved market efficiency (Baker & Stein, 2004). Similarly, the Efficient Market Hypothesis (Fama & French, 2007) suggests that stock markets are efficient, meaning that company risk is accurately priced and reflected promptly in market prices.

Market microstructure theory, introduced by Garman (1976), explains how trading processes and market structures influence price formation and liquidity. Madhavan (2000) extended this concept by examining the relationship between price discovery and market design, emphasizing how market structure affects efficiency and the incorporation of information.

Martinez et al. (2005) highlight that when managers' compensation is tied to stock performance, they are more likely to act in shareholders' best interests. However, this alignment may also create price pressures that could negatively affect firm profitability. Similarly, Edmans and Manso (2011) note that highly liquid stocks allow easier and less costly entry and exit, thereby reducing transaction costs and enhancing market participation. Hussain et al. (2021) further argue that high liquidity stocks reduce information asymmetry, contributing to a more transparent information environment between insiders and outsiders.

Li and Zhou (2024) analyzed U.S. bank liquidity and found that increased funding liquidity raised market synchronicity and market risk. Ryu et al. (2024) documented a U-shaped relationship between stock price synchronicity and equity market liquidity in emerging markets. Liang et al. (2024) examined liquidity synchronization in seven emerging Asian economies, revealing that higher liquidity synchronicity occurs during periods of economic volatility, particularly in China. Zhang et al. (2024) provide further support for signaling theory by showing that mandatory corporate social responsibility (CSR) reporting increases stock price synchronicity.

The liquidity of the stock market improves when financial reporting quality is high, as it reduces information asymmetry between investors and firms (Leuz & Verrecchia, 2000). High-quality financial reporting enhances the credibility, transparency, and comparability of accounting information, providing investors with better information on firm fundamentals and risks (Biddle et al., 2009). Habib et al. (2022) find that firms with higher financial reporting quality experience lower liquidity risk, higher trading volumes, and narrower bid-ask spreads, resulting in more efficient incorporation of price-relevant information.

According to Lee and Rui (2021), liquidity synchronization depends on the co-movement of individual stocks with aggregate market liquidity. Higher liquidity synchronization indicates that systematic liquidity shocks are lower, enhancing firm-level information efficiency. Chan et al. (2021) show that poor market information increases commonality in liquidity, leading market participants to rely less on firm-specific information.

Recent studies (Dang et al., 2023; Tran et al., 2024) directly examine the relationship between liquidity synchronization and financial reporting quality. They show that firms with high-quality accruals, timely disclosures, and conservative accounting practices reduce market-wide liquidity conditions. In emerging economies, strong financial reporting quality significantly improves market efficiency and decreases systematic liquidity risk.

Financial reports provide information on daily activities, cash flows, investments, and equity holdings, offering accurate and fair representations of a company's financial position (Ball et al., 2000). The accuracy of financial reporting is further influenced by the adoption of IFRS (International Financial Reporting Standards), which has been shown to enhance liquidity (Florou & Kosi, 2008). Empirical evidence from developed and emerging markets indicates that IFRS adoption establishes more stringent and transparent accounting rules, reduces market information asymmetry, and reflects regulatory strength (Daske et al., 2008). Additional studies suggest that policies improving the quality of corporate disclosures boost liquidity, although their effectiveness depends on the regulatory environment (Chen et al., 2007; Li et al., 2018). Based on the above literature, the following hypothesis is proposed:

H1: There is a significant relationship between financial reporting quality and liquidity synchronization.

3. Methodology

To examine the relationship between financial reporting quality and liquidity synchronization across BRICS economies, this study collects data from listed companies on representative stock markets (see Appendix A1 for detailed information about the stock exchanges). The dataset covers both financial and non-financial sectors in BRICS countries over a 12-year period, from 2012 to 2023. Data sources include the World Development Indicators, World Governance Indicators, and Refinitiv DataStream.

This study employs Fully Modified Ordinary Least Squares (FMOLS) for several reasons. First, FMOLS is suitable for analyzing long-term relationships across countries. Second, it provides meaningful insights regarding the relationship between financial reporting quality and liquidity synchronization. Third, FMOLS is a non-parametric approach that effectively addresses endogeneity issues (Phillips, 1995). Finally, FMOLS is superior to standard regression techniques for non-stationary data, as it offers a reliable and consistent framework for long-term data analysis (Kheifets & Phillips, 2023).

Per Capita GDP: Following Adjoud et al. (2010), per capita GDP represents the average income per person in a country. The following formula is used to calculate per capita GDP:

$$Per\ Capita\ GDP = Log\ of\ USD\ per\ capita\ GDP\ in\ year\ t-1 \qquad (1)$$

Inflation Rate: According to Adjoud et al. (2010), the inflation rate represents the percentage change in the general price level of goods and services in an economy over a specific period. The following formula is used to calculate the inflation rate:

$$Consumer\ price\ index = Annual\ percentage\ change\ in\ the\ cost\ of\ goods\ and\ services\ for\ the\ average\ consumer \quad (2)$$

Firm Size: According to Adjoud et al. (2010), firm size refers to a measure of the scale of a company's operations or its economic presence. The following formula is used to calculate firm size:

$$Firm\ Size = Natual \log of\ total\ assets \quad (3)$$

Furthermore, Financial Reporting Quality (FRQ) is measured using the Kasznik (1999) model, which is widely applied for assessing reporting quality (Gomraiz & Sanchez Ballesta, 2013). The following equation is used to calculate FRQ in the current study:

$$TA_{i,t}=\alpha_{it}+\beta_1\Delta Sales_{it}+\beta_2 PPE_{it}+\beta_3\Delta \mathrm{CFO}_{it}+\epsilon_{it} \quad (4)$$

In Equation (1), α represents the intercept, β denotes the coefficient, TA stands for total accruals, ΔSales indicates the change in sales, PPE represents property, plant, and equipment, CFO refers to cash flow from operations, i denotes the firm, t denotes the time period, and ε is the error term. Furthermore, market efficiency is measured using stock returns. The following formula is used to calculate daily stock returns:

$$\boldsymbol{R_t} =[100*(\mathbf{ln}\ (\boldsymbol{P_t})\text{-}\boldsymbol{ln}(\boldsymbol{P_t}\text{-}1))] \quad (5)$$

In Equation (2), R_t represents the return at time t, expressed as a percentage; P_t is the asset price at time t; P_{t-1} is the asset price at the previous time period (i.e., the previous day); Ln denotes the natural logarithm of the prices; and multiplication by 100 converts the values into percentages. Additionally, a dummy variable is created to indicate the presence of market efficiency, using the market efficiency test and the variance ratio test (Miah & Banik, 2013), with values of 0 and 1. Liquidity synchronization is calculated using the ordinary least squares (OLS) method along with a market model to examine the liquidity synchronization of each stock for a given year:

$$\Delta L_{i,t}=\beta_0+\beta_1\Delta LM_t+\beta_2\Delta LM_{t+1}+\beta_3\Delta LM_{t-1}+\beta_4 RM_t+\beta_5 RM_{t+1}+\beta_6 RM_{t-1}+\beta_7 RV_{i,t}+\epsilon_{i,t} \quad (6)$$

In Equation (3), the incremental represents the percentage change in market liquidity from day t-1 to day t, and $\Delta L_{i,t}$ denotes the proportional change in the liquidity of the stock i from day t-1 to day t. The Amihud illiquidity ratio is used in our analysis to gauge liquidity. With a dollar of trading volume, this price effect proxy calculates the daily price response (Amihud, 2002). The ratio is determined by:

$$\mathbf{Amihud\ ILLIQ_t}= {}^{\mathbf{|rt|}}\!/_{\boldsymbol{Pt}}*\mathrm{Volt} \quad (7)$$

In Equation (4), Volt is the daily share trading volume, and $\boldsymbol{r_t}$is the daily return. The following formula is used to calculate the daily return on stocks:

$$r_t= [100 * (\ln (P_t)\text{-}\ln (P_{t-1}))] \quad (8)$$
$$Volt = [\ln (N_t)] \quad (9)$$

For using the dependent variable in our study, we assess the liquidity synchronization using Gamma (ϒ), the logarithmic transformation of $\boldsymbol{R^2}$

$$\boldsymbol{\gamma}=\log {}^{\boldsymbol{R_i^2}}\!/_{\mathbf{1}-\boldsymbol{R_i}} \quad (10)$$

In Equation (7), the log of the modified $\boldsymbol{R^2}$ is used to determine liquidity synchronization because $\boldsymbol{R^2}$ is a limited range between 0 and 1. Gamma (γ) is a $\boldsymbol{R^2}$ function that monotonically increases. Because of the transformation, it has a more normal distribution than $\boldsymbol{R^2}$. It was therefore chosen above $\boldsymbol{R^2}$in empirical investigations. A higher number γ denotes the relationship between stock liquidity sensitivity towards market liquidity. Our dependent variable, Gamma (γ), is regressed on variables that are unique to each country to find out what factors affect liquidity synchronization. Furthermore, for sustainable development, we use the ranking of the World Bank for the levels of human development as the human development index (HDI) (UNDP, 2023).

3.1. Econometric Equations

Equation 8 shows the relationship between the financial reporting quality and the liquidity synchronization of the BRICS countries. γ shows the liquidity synchronization; β shows the constant term; FRQ shows the financial reporting quality; Inf shows the inflation rate; GDP shows the gross domestic product; FS shows the firm size; ∈ shows the error term; i shows the number of companies and t shows the time period.

$$\gamma_{i,t}=\beta_0+\beta_1 FRQ_{i,t}+\beta_2 Inf_{i,t}+\beta_3 GDP_{i,t}+\beta_4 FS_{i,t}+\in_{i,t} \quad (11)$$

4. Results

Table 1 shows the descriptive statistics of BRICS countries. The result shows that the mean value of FRQ in China is 9.2508, which means that the financial quality of the Chinese companies is higher or better than that of the other BRICS countries. The size of the firms, which is the ratio of total assets, is shown in FS, and the result shows that the FS value of Russia is 23.778, which is higher than the other BRICS countries, which means that the size of the other countries is lower, or they have a lower ratio of total assets invested in the BRICS companies. LiqSyn shows that, on average, the synchronization of Brazilian companies is higher than that of the other countries in the sample. The GDP of Russia shows $10274.1 trillion, which is quite high compared to the other countries in the sample. The other countries show a lower ratio of GDP. The result of Russia shows 7.20% of inflation, which is higher than in other countries.

Table 1. Descriptive statistics BRICS countries.

Variables	Brazil		Russia		India		China		South Africa	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
FRQ	7.2983	3.2049	5.1506	2.1509	4.3754	2.9608	9.2508	4.1809	6.0308	3.8008
FS	22.090	12.857	23.778	13.335	20.180	13.762	21.538	12.210	21.384	19.521
LiqSyn	3.5471	1.8398	1.5857	0.8972	1.6238	0.9654	1.6437	0.0332	1.7001	0.8648
GDP	8206.5	4103.0	10274.1	5137.05	1637.15	818.575	7965.74	3982.87	361.25	180.625
Inf	6.006	2.231	7.2001	3.7220	6.478	2.426	2.0067	1.6830	4.9333	2.1798

Note: FRQ shows financial reporting quality; FS shows firm size; LiqSyn shows liquidity synchronization; GDP shows gross domestic product; Inf shows inflation.

See annexure for table A1 to A10. Table A1 shows countries and exchange. Table A2 shows the correlation matrix of Brazil. The result shows that the FRQ and liquidity synchronization are positively correlated because when the liquidity synchronization is higher, the stock return of the companies is also higher. Inf and liquidity synchronization are negatively correlated because when the inflation level of the country increases, it negatively affects the synchronization of the companies. FS and liquidity synchronization are negatively correlated. GDP and liquidity synchronization are positively correlated, while GDP and FRQ exhibit a negative correlation.

Table A3 shows the results of all the variables used in the analysis of China, and the findings reveal that FRQ and LiqSyn are negatively correlated; Inf and LiqSyn are positively correlated; GDP and Gama are also positively correlated. FS and FRQ are negatively correlated; Inf and FS are positively correlated; GDP and FS are negatively correlated. Inf and GDP are both positively correlated with FRQ. Inf and GDP are negatively correlated because when the inflation level within the country increases, it also decreases the earnings and the GDP of the country.

Table A4 shows the correlation matrix of India. The result shows that FS and Inf are positively correlated; FS and GDP are negatively correlated; FS and FRQ are positively correlated. Gama and Inf are positively correlated; Gama and GDP are negatively correlated; Gama and FRQ are positively correlated. Inf and GDP are negatively correlated; Inf and FRQ are negatively correlated; GDP and FRQ are positively correlated.

Table A5 explains the correlation matrix of variables used in the study for Russia. The result shows that FS and Gama are positively correlated; FS and FRQ are negatively correlated; FS and Inf are negatively correlated; FS and GDP are positively correlated. Gama and FRQ; Gama and Inf are negatively correlated; Gama and GDP are positively correlated. FRQ and Inf; FRQ and GDP; Inf and GDP are positively correlated.

Table A6 explains the correlation matrix of all the variables in the current study of South Africa. The result shows that Gama, FRQ, and Inf are positively correlated; FS and GDP are negatively correlated. Gama and FRQ, Gama and Inf, and Gama and GDP are positively correlated. FRQ and Inf are positively correlated. FRQ and GDP, Inf and GDP are negatively correlated. Furthermore, in the current analysis, we employed the ADF-Fisher Chi-Square test, Im, Pesaran & Shin W-Stat test, and the PP-Fisher Chi-Square test to examine the panel unit roots. The result presented in Tables A7 and Table A8 indicates that all variables are stationary at the level.

Table A9 further reports the Hadri Z-statistic and the heteroscedastic-consistent Z-statistic, confirming the stationarity of the dataset. As shown, the p-values for all BRICS countries are below the 5% threshold, demonstrating statistical significance at the level. To assess long-run relationships, the Johansen co-integration test was applied, with results presented in Table A10. These findings reveal that the variables for all BRICS countries have p-values below 5%, thereby confirming the existence of a long-run relationship among them.

Table 2 presents the FMOLS results for the BRICS countries. The findings indicate that Brazil's FRQ exhibits a highly significant positive relationship. While all other countries also show statistically significant results, the effect observed for Brazil is particularly strong and stands out in terms of significance. FS shows a negative and insignificant relationship with LiqSyn in India and China, but in the other three countries, it shows a significant relationship. GDP shows a highly significant relationship in Brazil, China, and South Africa. In India, the result shows an insignificant value of Inf, but in other countries, it shows highly significant values. Overall, the South African model is better compared to the other countries because it explains a higher value of the dependent variable.

Table 2. Impact of financial reporting quality on liquidity synchronization of BRICS countries.

	Brazil	**Russia**	**India**	**China**	**South Africa**
Variables	**Co-eff** **Std. Err**	**Co-eff** **Std. Err**	**Co-eff** **Std. Err**	**Co-eff** **Std. Err**	**Co-eff** **Std. Err**
FRQ	0.004 (0.000)***	-8.55 (0.034)**	-1.902 (0.012)**	5.24 (0.005)**	-1.28 (0.011)**
FS	-0.2511 (0.045)**	0.032 (0.033)**	-0.023 (0.511)	-0.592 (0.221)	0.1387 (0.000)***
GDP	-0.028 (0.000)***	2.934 (0.010)**	0.113 (0.011)**	0.010 (0.000)***	0.002 (0.000)***
Inf	-7.99 (0.000)***	-0.009 (0.023)**	-0.082 (0.323)	0.025 (0.000)***	-0.265 (0.000)***
C	3.009 (0.000)***	-3.124 (0.000)***	-1.283 (0.000)***	-1.732 (0.000)***	-2.217 (0.000)***
R-Square	**11.406%**	**34.511%**	**27.38%**	**59.56%**	**66.983%**

*Note: FRQ shows financial reporting quality; FS shows firm size; GDP shows gross domestic product; Inf shows inflation rate. Values in parentheses represent the standard error, while *'**'*** denote the significance levels at 10%, 5% and 1%, respectively.*

5. Discussion

Li et al. (2024) examined market liquidity using the beta index and found that liquidity synchronization, calculated via the beta index, provides a more accurate estimation. The concept of liquidity synchronization, particularly when measured by the beta index, offers valuable insight into cross-asset market dynamics. In countries with more efficient and integrated markets, liquidity shocks in one asset are more likely to propagate to others, reflecting stronger systemic linkages and faster information diffusion. In contrast, in less efficient markets—characterized by fragmented trading systems or underdeveloped institutional infrastructure—liquidity synchronization is weaker and more erratic.

According to the West African Monetary Agency (2009), instability in a country's financial system can have adverse effects on the overall economy. Improving financial stability enhances managerial effectiveness, increases capital ratios, and facilitates the implementation of rules and regulations. In the BRICS context, enhancements in regulatory quality, enforcement of disclosure standards, and development of trading infrastructure have been shown to significantly boost market confidence and attract capital inflows. For example, India's efforts through the Securities and Exchange Board of India (SEBI) to enforce disclosure and accounting standards have been associated with increased liquidity and investor participation, particularly after the 2000s (Patel & Sharma, 2017).

Chan and Chan (2014) report a positive relationship between stock liquidity and liquidity synchronization in countries with higher market efficiency. From the perspective of dynamic capabilities theory, firms operating in efficient capital markets with strong institutional oversight can leverage liquidity as a strategic resource.

A critical area of financial research is understanding the significance of financial markets and the various dynamics that influence them. Previous studies (Wang, 2013; Marshall et al., 2013; Cor et al., 2013; Anthony et al., 2017; Mancini et al., 2013) have primarily focused on establishing the presence of liquidity synchronization across markets and diverse economies. By analyzing the relationships between these determinants, researchers contribute to the development of more effective risk management strategies. Building on this literature, the current study examines the relationship between financial reporting quality (FRQ) and liquidity synchronization within BRICS countries.

The current study also provides practical policy implications for managers, policymakers, regulators, investors, and corporate decision-makers. Understanding the relationship between liquidity synchronization and its determinants within BRICS economies is vital, as liquidity synchronization represents a systematic risk affecting stock prices. High levels of liquidity synchronization may indicate market inefficiency, while high stock liquidity typically demands higher expected returns from investors. The findings offer guidance on what level of liquidity is considered safe for both shareholders and firms.

However, the study has some limitations. It focuses exclusively on BRICS countries, excluding other emerging and developed economies. Future research should consider a broader set of countries to enable comparative analyses. Additionally, macroeconomic, political, and institutional factors may also influence liquidity synchronization. Future studies should incorporate these variables to better understand their impact. While this study examines the effect of financial reporting quality on liquidity synchronization, other firm-specific factors—such as profitability, leverage, and institutional ownership—may also play a role. Future research should include these factors to provide a more comprehensive analysis of determinants of liquidity synchronization.

6. Conclusion

This study employs the Fully Modified Ordinary Least Squares (FMOLS) methodology, a third-generation econometric technique. FMOLS is particularly suitable for analyzing long-term relationships in large panel datasets, such as those comprising all listed companies in the BRICS countries, sourced from DataStream. This approach effectively addresses potential issues related to endogeneity, serial correlation, and provides robust and consistent estimates. By applying FMOLS, the study achieves a more accurate analysis of the relationships between variables, contributing to a deeper understanding of the economic dynamics underlying BRICS economies. The results indicate that FRQ is significantly related to liquidity synchronization, suggesting that high-quality financial reporting facilitates better investment decision-making. These findings have important implications for regulators, central banks, and market participants, highlighting the critical role of liquidity synchronization in emerging markets. Moreover, the study's conclusions carry significant implications for foreign investment and portfolio diversification. Traditional capital asset pricing models consider market risk as the primary determinant of systematic price fluctuations. However, in scenarios where liquidity is synchronized with market returns, investors must also account for liquidity as an additional risk factor to effectively mitigate risks in global financial markets. Theoretical models on liquidity constraints in financial intermediaries underscore the importance of liquidity, particularly during periods when arbitrageurs are forced to sell stocks following significant market declines. Liquidity risk is therefore a crucial component of asset pricing, as arbitrageurs typically require compensation for bearing this risk. This demonstrates that liquidity risk is a concern not only in academic literature but also in financial practice and policy discussions.

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Annexure

Table A1. Countries and exchange.

Country Name	Exchange
Brazil	Bolsa de Valores do Estado de Sao Paulo
Russia	Moscow Stock Exchange
India	National Stock Exchange of India
China	Shanghai Stock Exchange
South Africa	The Johannesburg Stock Exchange Limited (Embargo)

Table A2. Correlation matrix of Brazil.

	LiqSyn	FRQ	Inf	FS	GDP
LiqSyn	1				
FRQ	0.0142	1			
Inf	-0.0189	0.0130	1		
FS	-0.0083	0.0594	0.0368	1	
GDP	0.0136	-0.0126	0.0370	0.1311	1

Note: LiqSyn is used for the liquidity synchronization; FRQ is used for the financial reporting quality; FS is used for the firm size; GDP is used for the per capita GDP.

Table A3. Correlation matrix of China.

	LiqSyn	FS	FRQ	Inf	GDP
LiqSyn	1				
FS	-0.0112	1			
FRQ	-0.0152	-0.5622	1		
Inf	0.0136	0.0074	0.0016	1	
GDP	0.0180	-0.0062	0.0010	-0.1250	1

Note: LiqSyn is used for the liquidity synchronization; FRQ is used for the financial reporting quality; FS is used for the firm size; GDP is used for the per capita GDP.

Table A4. Correlation matrix of India.

	FS	Gama	Inf	GDP	FRQ
FS	1				
Gama	-0.0131	1			
Inf	0.0025	0.0096	1		
GDP	-0.0033	-0.0086	-0.1753	1	
FRQ	0.0599	0.0273	-0.0091	0.0138	1

Note: LiqSyn is used for the liquidity synchronization; FRQ is used for the financial reporting quality; FS is used for the firm size; GDP is used for the per capita GDP.

Table A5. Correlation matrix of Russia.

	FS	LiqSyn	FRQ	Inf	GDP
FS	1				
LiqSyn	0.0972	1			
FRQ	-0.1123	-0.0378	1		
Inf	-0.0495	-0.0299	0.0011	1	
GDP	0.0116	0.0656	0.0091	0.1466	1

Note: LiqSyn is used for the liquidity synchronization; FRQ is used for the financial reporting quality; FS is used for the firm size; GDP is used for the per capita GDP.

Table A6. Correlation matrix of South Africa.

	FS	Gama	FRQ	Inf	GDP
FS	1				
Gama	0.5055	1			
FRQ	0.0639	0.0901	1		
Inf	0.0097	0.0481	0.0057	1	
GDP	-0.0317	0.0111	-0.0081	-0.0877	1

Note: Gama is used for the liquidity synchronization; FRQ is used for the financial reporting quality; FS is used for the firm size; GDP is used for the per capita GDP.

Table A7. Moon and Perron test of the panel unit root test Bartlett Kernel function.

	Brazil	Russia	India	China	South Africa
	p-value	**p-value**	**p-value**	**p-value**	**p-value**
FRQ	0.0001	0.000	0.011	0.000	0.0001
FS	0.000	0.001	0.001	0.002	0.0011
LiqSyn	0.000	0.002	0.000	0.002	0.001
GDP	0.0001	0.000	0.000	0.002	0.000
Inf	0.001	0.000	0.000	0.000	0.0001

Note: FRQ shows financial reporting quality; FS shows firm size; LiqSyn shows liquidity synchronization; GDP shows gross domestic product; Inf shows inflation.

Table A8. Panel unit root test summary.

	Brazil	Russia	India	China	South Africa
Panel unit root tests	**p-value**	**p-value**	**p-value**	**p-value**	**p-value**
Im, Pesaran, and Shin W-stat	0.000 (I-0)	0.000 (I-0)	0.000 (I-0)	0.000 (I-0)	0.000 (I-0)
ADF - Fisher Chi-square	0.000 (I-0)	0.000 (I-0)	0.000 (I-0)	0.000 (I-0)	0.000 (I-0)
PP - Fisher Chi-square	0.000 (I-0)	0.000 (I-0)	0.000 (I-0)	0.000 (I-0)	0.000 (I-0)

Table A9. Stationarity of the variables used in the study.

	Brazil		Russia		India		China		South Africa	
	t-stats	**p-value**	**t-stats**	**p-value**	**t-stats**	**p-value**	**t-stats**	**p-value**	**t-stats**	**p-value**
Hadri Z-stat	6.416	0.000	4.541	0.000	9.756	0.000	8.522	0.000	8.137	0.000
Heteroscedastic Consistent Z-stat	18.371	0.000	4.063	0.000	9.775	0.000	5.983	0.000	3.287	0.000

Table A10. Johansen Co-Integration test.

	Brazil		Russia		India		China		South Africa	
Variables	**t-Stats**	**P-value**	**t-Stats**	**P-value**	**t-Stats**	**P-value**	**t-Stats**	**P-value**	**t-Stats**	**P-value**
FRQ	-4.150	0.000	-7.246	0.0017	-6.321	0.000	-7.213	0.000	-4.600	0.016
FS	-4.178	0.000	-7.297	0.0046	-6.273	0.000	-6.216	0.000	-9.700	0.000
LiqSyn	3.351	0.000	-8.452	0.0014	-7.287	0.0615	-8.435	0.000	-9.446	0.000
GDP	2.117	0.001	-6.602	0.000	-6.948	0.000	-9.832	0.000	-14.673	0.000
Inf	-3.971	0.000	4.892	0.0156	-8.532	0.003	-7.586	0.0002	-7.942	0.0001

Note: FRQ shows financial reporting quality; FS shows firm size; LiqSyn shows liquidity synchronization; GDP shows gross domestic product; Inf shows inflation.