

## Impact of crypto currencies on performance of stock returns: Evidence from BRICS countries

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**Abstract.** *The interlink-ages between crypto currencies and stock indices in a panel of BRICS economies are empirically examined in this study. The panel of econometric techniques namely Levin, Lin and Chu (LLC) panel unit root test, Johansen Fisher, Pedroni, and Kao Panel cointegration, Dumitrescu and Hurlin panel granger causality, the fixed effects model and IV-GMM models are applied for empirical investigation. For analysis, both daily and quarterly panel data of BRICS stock indices namely BOVESPA Index (Brazil), MOEX Index (Russia), NIFTY 50 Index (India), SSE Composite Index (China), and FTSE Index (South Africa), as well as the Bitcoin (BTC), Ethereum (ETH), Binance (BNB) and macro-economic variables are all obtained through world bank and investing.com from December 2017 to December 2023. The result of fixed effects and IV-GMM models suggests that the performance of stock indices in BRICS countries negatively impacted by crypto currencies, inflation and oil prices, whereas, real GDP has positively impacted the stock indices in these five economies. Panel Causality test result confirms a short run relationship exists between crypto currencies and stock indexes. The findings also indicated that a long-run equilibrium relationship do not exhibit between crypto currencies and BRICS stock indices. Based on our findings, suitable policy is recommended to regulate the crypto currency market.*

**Keywords:** crypto currencies, stock indices, panel granger causality test, panel cointegration test.

**JEL Classification:** F65, O16.

## Introduction

The crypto currency market is considered a major fintech (Financial Technology) innovation that facilitates transactions and plays an important role as a medium of exchange. Such a virtual currency has occupied a special place in the international financial markets, especially after its rapid development and expansion. In particular, in 2018, the market capitalization of the crypto currency market has increased to \$139 billion with more than 2, 50,000 transactions per day.

According to recent data, more than 2300 US businesses accept bitcoin, and that doesn't include bitcoin ATMs. More and more companies around the world are using bitcoin and other digital assets for a variety of investment, operational, and transactional purposes. Considering the meteoric rise in the value of crypto-currencies, putting money into businesses that have made some crypto-related investment could be a wise move. Inflation, monetary, and fiscal policy sensitivity make fiat money unattractive to investors; consequently, capital is fleeing to digital currencies. Existing studies show the stock markets in developing and the developed economies affected by crypto currencies. There have been cases where fluctuations in the value of major crypto-currencies have had an impact on the value of stocks and other instruments (Kim, J.M. et al., 2020; Jeribi, A., & Ghorbel, A. 2021), (Mina et al., 2020; Xia et al., 2020).

The present study focuses on how crypto currencies affect stock prices in countries of Brazil, Russia, India, China and South Africa (BRICS). The impact of crypto currencies on stock prices has limited, with little correlation among two markets. However, there has been instance of price movements in bitcoin and other crypto currencies which affects securities prices in stock market. For example, in 2017, price of bit-coin has increased to \$ 20,000 and investors partially sold off stocks in international stock markets to invest in bitcoin and other crypto assets. Therefore, the fluctuations in value of crypto currencies lead to changes in stock and other securities prices/returns. The crypto currencies like bitcoin offer several attractive opportunities for investors that are likely to impact the stock market performance/market returns. Mainly, the retail investors are major participants in crypto currency market due to lack of market regulation and offer higher returns. Existing studies assume that the stock market is driven by three main factors: fundamental, macroeconomic, company specific factors and this study introduces the crypto currencies as an additional factor in determining stock market performance in the countries of Brazil, Russia, India, China and South Africa (BRICS). Theoretically it can be said crypto currencies as the main determinant of stock market performance/stock market returns.

## Review of Literature

There are studies have focused on impact of crypto currencies on stock market performance in developed and emerging economies however, they provide inconclusive results. Mina

Sami and Wael Abdallah (2020) studied the impact of crypto currencies on stock market performance in the MENA region by applying the (IV-GMM) method. Daily data of crypto currencies and stock indices for the period 2014-2018 was sourced from coinmarketcap.com and used for analysis and discussion. The results show that crypto-currency market had a negative impact on performance of stock market in the MENA (Middle East and North Africa) region.

Jong-Min Kim and et.al., (2020) studied the relationship of crypto currencies and volatility of US stocks by applying the GARCH-DCC model. The sample consists of daily prices of the nine crypto-currencies and US S&P 500 stock prices from January 2018 to September 2020. The result suggests that the relationships between the time-dependent conditional correlation with the volatility of bitcoin prices and US S&P 500 stocks.

Also, Xin Wang and et.al, (2020) examined the relationship between crypto currency and the USA stock markets by using vector autoregressive model. Their results show that a significant relationship exists between both markets. Finally, result suggests that the USA S&P 500 index has a relatively large impact on bitcoin prices, while the impact of bitcoin on USA S& P 500 index was weak.

Bhullar and Bhatnagar (2020) investigated the relationship between cryptocurrency (bitcoin) prices and stock market movements of two major world economies, namely India and China. Daily prices of bitcoin and stock indices of two economies are collected from January 2<sup>nd</sup>, 2015 to November 29<sup>th</sup>, 2019 and also time series techniques namely Johnson Co-Integration, VECM and Granger Causality are applied to achieve the objective of the study. The empirical result shows that a strong long-run equilibrium relationship exists between crypto and the stock markets. The result also suggests that higher bitcoin returns significantly affected Indian and Chinese stock markets.

Jeribi, A., Jena, S.K., & Lahiani, A. (2021) examined the haven properties of bitcoin, ethereum, dash, monero, and ripple and BRICS stock markets (Brazil, Russia, India, China, and South Africa) during the COVID-19 pandemic (1<sup>st</sup> January 2016 to 30<sup>th</sup> January 2020). This study used the Nonlinear Autoregressive Distributed Lag (NARDL) methodology and co-integration test to explore the short and long-term relationship between the stock and crypto-currency markets. The result suggests that dash and ripple are safe havens in all five markets, demonstrating their capacity to protect portfolio assets during stock market downturns. The results also reveal that a long run equilibrium association exists between crypto currencies and stock indices in BRICS economies.

Dahir, A. M. et al., (2020) uses the daily data from January 2, 2012, to May 31, 2018, to study the volatility transmission between bitcoin and stock returns in the BRICS countries. Their results confirms that a bidirectional volatility transmission exists between crypto and equities markets in these economies. Similarly, Mohd Thas Thaker et al (2021) examined the relationship among Asian equity indices and bitcoin prices by using daily data from

July 2010 to April, 2019. Their result confirmed that a short - and long-term equilibrium link exists between bitcoin prices and a range of Asian equity indices.

Campani (2021) explored the impact of crypto currencies on the performance of Brazilian stock market by using daily data from September 2014 to April 2020. His results confirmed that the higher crypto currencies returns have an adverse impact on performance of stock returns. Mina Sami and Wael Abdallah (2022) examined the impact of the crypto-currency market on the market value of companies, particularly at the sector level, in Africa by applying panel-correlated standard errors and panel-double-panel standard errors related tests. Their result showed that companies in less competitive sectors are more likely to be hurt by the expansion of crypto- currency market.

Kumah and Mensah (2021) studied integration between crypto currency and African stock markets by using daily data from 2015 to 2020. The result reveals that the low levels of integration between markets at higher frequencies, enhanced at mid frequencies and perfectly integrated at lower frequencies. However, Yasar Kaya (2018) finds that there is a existence of a speculative bubble in crypto currency market period of 2014-2018, thus confirming the evolution of bitcoin has proven to be highly speculative.

Thus, empirical evidences related to impact of crypto currencies on stock prices in developed and emerging economies offers inconclusive and mixed results. Further, to best of my knowledge there is no study confined with in case of BRICS countries. Therefore, this study made an attempt to investigate the impact of crypto currencies on performance of stock markets in these five emerging market economies.

### Objectives of the Study

The major objective of present study is to explore the impact of crypto currencies and macro-economic variables on performance of stock indices in a panel of BRICS economies and also examine the short-run and long-run relationship between crypto-currencies and stock indices in these five emerging market economies.

### Data and Methodology

#### Data Sources

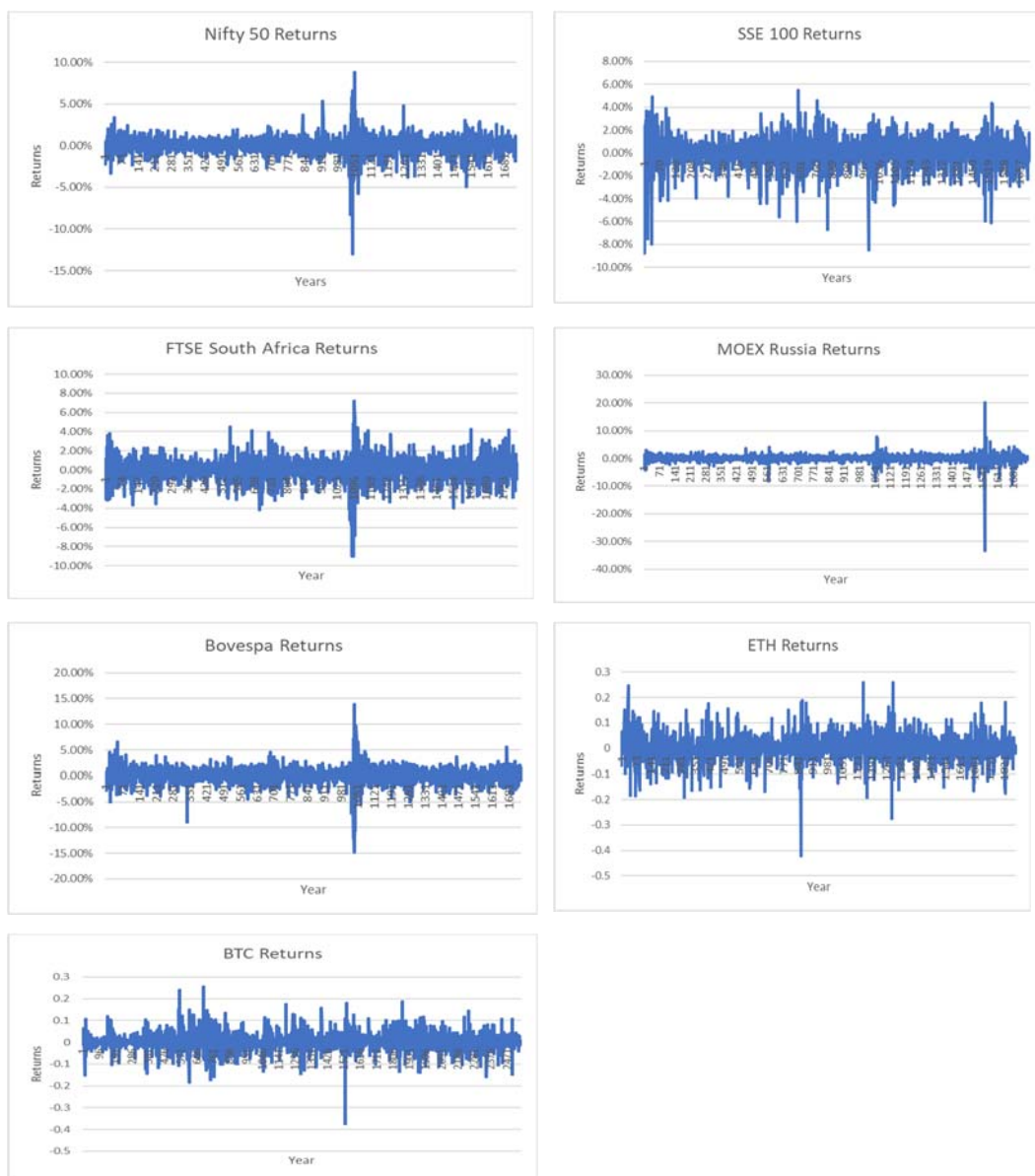
For analysis, both daily and quarterly panel data of stock indices in BRICS economies namely BOVESPA Index (Brazil), MOEX Index (Russia), NIFTY 50 Index (India), SSE Composite Index (China), and FTSE Index (South Africa), as well as Bitcoin (BTC), Ethereum (ETH), Binance (BNB) are obtained through Investing.com period from December 2017 to December 2023. For said period, country wise macro-economic variables data namely real GDP, inflation and oil price are taken from World Bank to check the impact of crypto currencies and other macro-economic variables on stock markets

performance in these five emerging markets economies. All variables are converted to natural logarithm to avoid spurious regression.

**Trends of BRICS’s Stock Indices and BTC, ETH Movements**

The daily returns of the stock indices in the BRICS Countries (BOVESPA, MOEX, NIFTY 50, SSE Composite, FTSE South Africa), as well as the daily returns of bitcoin, ethereum from December 2017 to December 2023 depicted in Figure 1.

**Figure 1.** Trends in BRICS stocks indices and BTC, ETC movements



## Methodology

The present study uses both single and multiple panel unit root tests namely Augmented Dickey-Fuller (ADF) and Levin, Lin and Chu (LLC) (2002) to determine if a given series or dataset is stationary. LLC is a test mainly designed to check the null hypothesis of common unit root in panel against stationarity once cross-sectional units are independent of each other and this is a necessary prerequisite for studying the long-run equilibrium association between cross sections

After checking the stationarity, the study uses panel Johansen Fisher, Pedroni and Kao panel cointegration test to confirm the co-integration relationship between crypto currencies and stock indexes in a panel of BRICS economies. Many techniques have been developed for panel co-integration namely kao (1999), Pedroni (2004) and fisher type Johansen panel co-integration methodology (2001). The Pedroni and Kao tests are based on Engle-Granger (1987) two-step residual-based cointegration tests. First step, we need to identify co-integration regression and in second step, residuals are taken from co-integration regression to check the stationarity. The panel co-integration allow for heterogeneous intercepts and trend coefficients across cross-sections whereas fisher test is a simply the combined Johansen panel co-integration methodology which allows to combine cross-sections.

Further to examine the casual relationship between crypto currency prices and stock indices in a panel of BRICS economies, we applied Dumitrescu and Hurlin Panel Granger Causality test. It is an advanced version of the Granger causality test for heterogeneous panel data techniques to check causal link among cross sections. The equation of panel Granger Causality test is specification as follows.

$$y_{it} = \alpha_1 + \sum_{k=1}^{\kappa} \lambda_{ik} y_{it-k} + \sum_{k=1}^k \phi_{ik} x_{i,t-k} + \varepsilon_{it} \quad (1)$$

In equation x and y represents panel variables.  $\lambda_{it}$  and  $\phi_{it}$  are panel Granger causality coefficients.  $\varepsilon_{it}$  is error term. The main aim of Dumitrescu and Hurlin Panel Granger Causality test is to confirm whether x granger cause y or not.

Based on model, we set following hypothesis.

$H_0: \phi_{i1} = 0$  There is no causal link among panel variables/cross sections

$H_1: \phi_{i1} \neq 0$  There is causal link among panel variables/cross sections

The fixed effects model and IV-GMM are used to examine the effect of crypto assets on the performance of BRICS stock indices. The advantages of fixed effects model is to capture unobservable heterogeneity among a panel of BRICS economies. The model specification can be written as follows.

$$y_{i,t} = \alpha_0 + Z\theta + X\beta + \sum_{i=1}^p \gamma_i + \eta_{i,t} \quad (2)$$

$Y_{it}$  denotes dependent variable that measures the performance of stock returns of country  $i$ .  $Z$  is set of series of crypto currencies namely bitcoin, binance, and ethereum which affects stock indices in BRICS economies.  $X$  is set of macro-economic variables (Real GDP, Inflation, Oil prices) that are assumed to be impact the performance of stock indices along with crypto currencies.  $\gamma_i$  is unobservable characteristics/fixed effects and  $\nu_{it}$  is statistically independent and identically distributed.

In order to test endogeneity between crypto assets and stock indices in BRICS economies, Durbin-Wu-Hausman test is applied. The study also introduces Instrumental Variables and Generalized Method of Moment (IV-GMM) model to test procedures for control of endogeneity overidentification and heteroskedasticity. Therefore, crypto currencies series are expected to be forecasted from its own lag series. In equation (3),  $Z$  considered main as instrument to deal with endogeneity. The model specification can be written as follows.

$$\hat{X} = \theta + \sum_{j=t-1}^L Z_{t-1} + \nu_{it} \quad (3)$$

$X$  is crypto currency variable to be forecasted from its own lag series of  $Z_{t-1}$ .  $\nu_{it}$  is error term.

Finally, we exact equation to be estimated the following.

$$\text{Stock Indices Performance}_{it} = \alpha + \theta_1 \text{Bitcoin} + \theta_2 \text{Ethereum} + \theta_3 \text{Binance} + \beta_1 \text{RealGDP} + \beta_2 \text{Inflation} + \beta_3 \text{Oil price} + \gamma_i + \nu_{it} \quad (4)$$

The equation (4) states that how crypto currencies and macro-economic variables impact the performance of stock returns in a panel of BRICS economies. Finally, this study applied Kleibergen Paap LM statistic test to check the over-identification.

## Results and Discussion

Table 1 presents the basic properties of descriptive statistics. The daily mean returns of bitcoin, ethereum, binance, real GDP and most of stock indices in BRICS economies are positive except MOEX index (Russia) and FTSE index (South Africa). The standard deviation of crypto digital currencies is higher among all penal variables. It shows higher volatility in crypto currency market when it is compared to BRICS economies stock markets. It also indicates that higher risky investment tends to provide higher returns. The measures of kurtosis and skewness show that crypto digital currencies, macro-economic variables and most of stock indices are positive and follow non normal distribution.

**Table 1.** Descriptive Statistics

Variables	Mean	Median	SD	Maximum	Minimum	Skewness	Kurtosis
Bitcoin	11.02312	7.7762	8.0946	4.9976	3.0790	2.1034	50.996
Ethereum	2.00421	1.1250	7.0772	5.0431	4.8020	1.3021	59.456
Binance	3.00257	2.0071	6.9950	-5.2114	4.7741	2.2340	48.340
IBOVESPA (Brazil)	-0.3484	-0.9870	0.0031	0.5310	-0.7790	0.8892	09.1901
MOEX (Russia)	-0.0023	-0.9970	0.0882	0.8540	0.1124	-0.9981	11.0002
Nifty (India)	0.0195	0.5431	0.0421	0.4530	-0.7762	0.1162	23.8720
SSE (China)	0.0345	0.8517	0.0532	0.7647	0.4567	0.2376	56.7219

Variables	Mean	Median	SD	Maximum	Minimum	Skewness	Kurtosis
FTSE Index (South Africa)	-0.0071	-0.4370	0.0021	0.3860	-0.1290	-0.0541	12.9980
Real GDP	0.0023	0.0751	0.0654	0.6511	0.5908	0.0027	09.8891
Inflation	0.0129	0.0332	0.0430	0.8410	0.1134	-0.2210	13.221
Oil Prices	0.0779	0.2319	0.231	0.9324	0.3321	-0.8810	16.3203

**Sources:** Authors own calculations.

The study begins by checking for stationarity in a panel of BRICS economies. For this purpose, both individual and panel unit root tests are performed. Table 2 summarises the empirical findings of both mainstream stationary methods and stand-alone stationary techniques. The log series of bitcoin, ethereum, binance, real GDP, inflation, oil Prices, IBOVESPA Index (Brazil), MOEX Index (Russia), Nifty 50 Index (India), SSE Composite Index (China), and FTSE Index (South Africa), are non-stationary at level form, as shown by the results of the Levin et al. (2002) and Augmented Dickey-Fuller (ADF) approaches. The results confirm that all series are non-stationary at level form and they became stationary in first differences. All variables strongly support the existence of a long-run equilibrium link between series, and this is a necessary prerequisite for studying the long-run equilibrium association.

**Table 2.** Results of Traditional Unit-root Tests

Variables	LLC test				ADF test			
	Common stationary approach				Individual stationary approach			
	Level	Prob.	With lag (1)	Prob.	Level	Prob.	With lag (1)	Prob.
Bitcoin	6.826	1.000	-9.341	0.000*	0.9430	1.000	-57.659	0.000*
Binance	3.110	7.22	-6.456	0.00	0.772	0.83	-58.771	0.00*
Ethereum	0.991	0.976	-6.446	0.000*	7.562	0.731	-92.603	0.000*
IBOVESPA Index (Brazil)	1.654	0.789	-10.264	0.000*	7.301	0.719	-91.301	0.000
MOEX Index (Russia)	4.456	0.992	-9.654	0.000*	0.883	0.965	-9.623	0.000*
Nifty Index (India)	5.996	1.000	-6.834	0.000*	10.784	0.886	-62.050	0.000*
SSE Index (China)	8.708	1.000	-11.561	0.000	0.764	1.000	-97.342	0.000*
FTSE Index (South Africa)	3.943	0.977	-6.765	0.000*	19.709	0.789	-56.890	0.000*
Real GDP	6.900	0.965	-12.478	0.000*	3.124	0.876	-14.893	0.000*
Inflation	1.247	0.421	-7.456	0.00*	1.334	0.347	-11.009	0.00*
Oil Prices	3.470	0.779	-11.890	0.00*	4.990	0.467	-15.009	0.00*

**Note:** \*Indicates 1 percent level of significance.

The table 2 result demonstrates that the provided series is stationary at the first difference, as shown by the standard and individual unit root tests. The first difference in the provided series has been confirmed via the Johansen Fisher, Pedroni, and Kao panel cointegration tests. The techniques also have an advantage in that they operate according to the Engel-Granger two-step method and consider homogeneity. Table 3 displays the outcomes of the panel cointegration methods. Since the null hypothesis was accepted, the Johansen Fisher, Pedroni, and Kao tests showed no cointegration between the provided series. The result suggests that no evidence of a long-term equilibrium link between bitcoin, ethereum, binance and the Brazilian BOVESPA Index, the Russian MOEX Index, the Indian NIFTY



50 Index, the Chinese SSE Composite Index, and the FTSE South Africa Index. This result is supported by and Abakah, Luis Gil Alana et al., (2022) for USA and Melih Sefa Yavuz et al., (2022) for Europe.

**Table 3.** The results of Johansen Fisher, Pedroni and Kao panel Cointegration test

Johansen Fisher Panel Cointegration Test				
Hypothesized No. of CE(s)	Fisher Stat.* (from trace test)	Prob.	Fisher Stat. (from max-eigen test)	Prob.
None	256.3*	0.000	214.3*	0.000
At most 1	144.3	0.573	212.0	0.670
At most 2	108.1	0.675	115.7	0.483
At most 3	101.2	0.711	103.9	0.862
At most 4	165.3	0.428	117.9	0.590
Pedroni Panel Cointegration Test				
Within-dimension (Null hypothesis: the absence of common coeffs.)				
Statistics	Statistic	Prob.	Statistic	Prob.
Panel v-Statistic	0.481	0.315	-0.616	0.731
Panel rho-Statistic	-1.565	0.358	-0.848	0.198
Panel PP-Statistic	-0.052	0.797	-1.954	0.239
Panel ADF-Statistic	-0.387	0.511	-1.429	0.459
Between-dimension (Null hypothesis: the absence of common coeffs.)				
Statistics	Statistic	Prob.	-	-
Group rho-Statistic	-0.062	0.475	-	-
Group PP-Statistic	1.612	0.555	-	-
Group ADF-Statistic	1.597	0.673	-	-
Kao Residual Cointegration Test				
			t-Statistic	Prob.
ADF			1.600	0.604

**Note:**\*Indicates 1 percent level of significance.

**Table 4.** Results of Dumitrescu and Hurlin Panel Granger Causality

Null Hypothesis:	Zbar-Stat.	Prob.
Growth in bitcoin returns does not homogeneously cause growth in stock indices returns	5.326*	0.000
Growth in stock indices returns do not homogeneously cause growth in bitcoin returns	9.456*	0.000
Growth in ethereum returns does not homogeneously cause growth in stock indices returns	0.227	0.441
Growth in stock indices returns do not homogeneously cause growth in ethereum returns	6.116*	0.000
Growth in binance returns does not homogeneously cause growth in stock indices returns	0.941	0.412
Growth in stock indices returns do not homogeneously cause binance returns	0.714	0.341

**Note:**\*Indicates 1 percent level of significance.

Next, the short-run direction of causation has been investigated using the panel causality test developed by Dumitrescu and Hurlin (2012). All data set is converted into growth rate to precede panel causality test. The primary benefit of this method, however, is that it assumes all calculated coefficients to be independent of one another across all cross-sections in the analysis. Table 4 displays the results of a panel causality test. The result reveals that a bidirectional causal link exists between bitcoin prices and stock market indices. However, there is a unidirectional causal link from stock indices to Ethereum. On the other hand, the causality between binance and stock indices are found to be independent. This empirical finding is supported by Maruf Yakubu Ahmed et al., (2023) for USA and Ritika Seth et al., (2022) for India. This finding proves that the short-run equilibrium link exists between these series.

**Table 5.** Results of Fixed Effects and IV GMM Models

Variables	Fixed Effects	IV- GMM
Bitcoin	-0.0157* (0.000)	-0.0197* (0.000)
Ethereum	- 0.0214** (0.001)	-0.0351** (0.000)
Binance	-0.0139* (0.000)	- 0.0332* (0.001)
Real GDP	0.7741* (0.000)	0.5621* (0.001)
Oil Prices	-0.2219* (0.000)	-0.3930* (0.000)
Inflation	-0.4510* (0.001)	-0.4810 (0.000)
Constant	0.19460* (0.000)	0.0547* (0.000)
R <sup>2</sup>	0.089	0.081
Hansen J test	-----	0.0016
Kleibergen		
Paap LM statistic test	-----	0.0470*
<b>Note:</b> * & ** Indicates 1 and 2 percent level of significance		

To explore the impact of crypto currencies and macro-economic variables on stock indices in a panel of BRICS economies, fixed effects and IV GMM models are performed. Table 5 displays the findings. The result demonstrates that crypto currencies have a significant and negative impact on performance of BRICS stock indices. This finding can be discovered from the two specifications of empirical models. This result is supported by Mina and Abdallah (2020) for Gulf countries and Shaturaev and Jakhongir (2023) for USA Economy. The result of fixed effect model reveals that 1 per cent increase in bitcoin returns associated with stock returns in BRICS countries decline by 0.15 per cent. Similarly, if 1 per cent rises in returns on ethereum and binance, the stock returns decline by 0.21 and 0.13 per cent respectively. It indicates that greater returns in crypto currency market result in lowest returns in BRICS stock markets. Both fixed effects and IV GMM models offer similar results. On the other hand, real GDP plays a crucial role in determining the performance of stock returns in BRICS economies. The result reveals that real GDP has significant and positive impact on stock returns. This empirical finding is similar to those of Giri and Pooja (2017) for India and Marceline Adella Violeta (2020) for Malaysia. However, oil prices and inflation have an adverse impact on performance of stock returns in BRICS economies since coefficients for inflation and oil prices are negative and significant. Mainly, inflation badly hits stock returns due to it affects corporate earnings and dividends. Finally Hansen J test result suggests that instruments are not over identified as the P value is insignificant.

### Concluding Remarks

The aim of research paper is to empirically examine the inter-linkages between cryptocurrencies, and stock indices in a panel of BRICS economies. The panel of econometric techniques namely Levin, Lin and Chu (LLC) panel unit root test, Johansen Fisher, Pedroni,

and Kao Panel cointegration, Dumitrescu and Hurlin panel granger causality, the fixed effects model and IV-GMM models are applied for empirical investigation. For analysis, both daily and quarterly panel data of stock indices in the BRICS countries namely BOVESPA Index (Brazil), MOEX Index (Russia), NIFTY 50 Index (India), SSE Composite Index (China), and FTSE Index (South Africa) as well as Bitcoin (BTC), Ethereum (ETH) and other macro-economic variables data are taken from December 2017 to December 2023. The result of fixed effect and IV-GMM models confirms that crypto currencies have a negative impact on performance stock returns in BRICS economies. It shows that stock and crypto markets are negatively correlated. This is due to fact that crypto digital currencies viewed to hedge against stocks. Similarly, oil prices and inflation have an adverse impact on performance of stock returns in these five economies. However, real GDP has significant and positive impact on stock returns. Panel causality test results showed that stock market indices and bitcoin all had a mutually causal link with one another. However, there is a one-way causal from stock indices to ethereum. The result demonstrates only short run relationship exists between crypto currencies and stock market indices. The results also indicated that a long-run equilibrium relationship do not exhibit between crypto currencies and stock indices in a panel of BRICS economies.

### **Policy Implications**

The retail investors and various companies in BRICS countries have invested the huge amount of money in unproductive virtual digital assets namely bitcoin instead of productive assets like stocks which leads to increase in volatility of financial markets that disproportionately collapse the financial system in these emerging market economies. In this context, the policy makers need to ensure that implementation of appropriate regulatory policy and also imposition of limit in investment of virtual currencies which helps to achieve the financial stability, prevention of money laundering and tax aviation etc.

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