International Research Journal of
BUSINESS STUDIES

ISSN: 2089-6271 | e-ISSN: 2338-4565 | https://doi.org/10.21632/irjbs

Vol. 19 | No. 2

Cryptocurrency Correlations Across Global Bull and Bear Equity Markets

Arief Rachmansyah & Nugraha

Department of Management, Universitas Pendidikan Indonesia
Jl. Dr. Setiabudhi No. 229 Bandung 40154 Jawa Barat - Indonesia

ARTICLE INFO

Keywords:
Cryptocurrency Hedging,
Market Regimes,
Correlation Dynamics,
Portfolio Diversification,
Global Equities

Kata Kunci:
Lindung Nilai Mata Uang Kripto;
Rezim Pasar;
Dinamika Korelasi;
Diversifikasi Portofolio;
Ekuitas Global.

Corresponding author:
arief.rachmansyah@upi.edu

Copyright © 2026 by Authors,
Published by IRJBS.
This is an open access article
under the CC BY-SA License

ABSTRACT

This study investigates the effectiveness of diversification and the correlation dynamics between cryptocurrencies and global equities (individual stocks, market indices) across seven diverse economies, explicitly considering distinct bullish and bearish market regimes. Addressing a literature gap that often overlooks granular dynamics and cross-country variations, we present empirical evidence for «The Elusive Hedge» phenomenon. This phenomenon demonstrates that the diversification benefits of cryptocurrencies often diminish or even reverse in bearish markets, contrasting with bullish market conditions. Through granular analysis at the individual stock level, we uncover hidden hedging opportunities obscured by aggregate index-level studies. These multi-country findings underscore the necessity of adaptive portfolio management strategies that account for regime-dependent correlation dynamics, thereby enhancing risk management and asset allocation in the interconnected global financial landscape.

SARI PATI

Studi ini menyelidiki efektivitas diversifikasi dan dinamika korelasi antara cryptocurrency dengan ekuitas global (saham individual, indeks pasar) di tujuh negara yang beragam, dengan mempertimbangkan rezim pasar bullish dan bearish. Mengatasi kesenjangan literatur yang sering mengabaikan dinamika granular dan variasi lintas negara, kami menyajikan bukti empiris untuk fenomena «Lindung Nilai yang Sulit Dipahami.» Fenomena ini menunjukkan bahwa manfaat diversifikasi cryptocurrency sering berkurang atau bahkan berbalik arah di pasar bearish, berbeda dengan kondisi pasar bullish. Melalui analisis granular pada tingkat saham individual, ditemukan peluang lindung nilai tersembunyi yang tertutupi oleh studi tingkat indeks agregat. Temuan multi-negara ini menekankan perlunya strategi manajemen portofolio adaptif, yang mempertimbangkan dinamika korelasi bergantung rezim, guna meningkatkan manajemen risiko dan alokasi aset dalam lanskap keuangan global.

INTRODUCTION

The rise of cryptocurrencies, spearheaded by Bitcoin and Ethereum, has profoundly reshaped the landscape of global financial markets over the last decade. Initially viewed as fringe or speculative assets, these digital currencies have garnered widespread market acceptance and are increasingly integrated into traditional investment portfolios. Their unique characteristics, including decentralization, high volatility, and often uncorrelated returns with conventional assets, have sparked intense debate among academics, investors, and policymakers regarding their potential role in portfolio diversification and risk management (Almeida & Gonçalves, 2022; Iyer, 2023; Sharma et al., 2022). The inherent high volatility of individual cryptocurrencies underscores the critical importance of effective diversification strategies for managing portfolio risk (Chaiyarit & Phuensane, 2024).

Existing literature has extensively explored the diversification, hedging, and safe-haven properties of cryptocurrencies, yielding complex and sometimes inconclusive findings (Almeida & Gonçalves, 2022). While some studies suggest that cryptocurrencies can offer diversification benefits due to their low correlation with traditional assets (Miller & Prondzinski, 2023), particularly in the short run (Huynh et al., 2020), others highlight their tendency for increased interconnectedness with financial markets during periods of heightened uncertainty or crisis (Aufiero et al., 2025; Bampinas & Panagiotidis, 2024). This dynamic nature challenges the conventional assumption of static correlations in portfolio optimization, rendering many traditional models inadequate for understanding assets with highly regime-dependent behaviors (Demiralay & Bayrac□, 2020). Furthermore, much of the existing research tends to focus on aggregate index levels, potentially overlooking crucial, nuanced dynamics that may emerge at the individual stock level. A more comprehensive understanding requires an explicit analysis of how these relationships shift under different regulatory and economic regimes and across a diverse set of economies (Adelopo & Luo, 2025; Demiralay & Bayracı, 2020) Previous studies often employ a limited range of stock indices or or confine their analysis to specific regions, thus necessitating a broader, multi-country perspective to enhance the generalizability of findings (Ahmed et al., 2022; Ibrahim et al., 2024; Setiawan & Bhaduri, 2023).

This paper addresses these gaps by conducting an in-depth investigation into the dynamic interplay between cryptocurrencies and a diverse set of global equities across different market regimes—specifically, bullish and bearish conditions. Our primary objective is to meticulously analyze the shifts in correlation at both the individual stock and broader market index levels across multiple developed and emerging economies. By so doing, we aim to uncover the varying diversification and hedging potentials that cryptocurrencies offer, particularly during critical market downturns. We seek to critically evaluate how these relationships evolve under differing market sentiments and what implications these shifts hold for portfolio construction and risk management strategies in a global context.

Our research yields several significant contributions to the existing body of literature. Firstly, we provide compelling empirical evidence for «The Elusive Hedge» phenomenon, demonstrating that while cryptocurrencies may offer diversification benefits in bullish or normal market conditions, these advantages often diminish, disappear, or even reverse during bearish markets. This critical observation, consistent with prior literature suggesting that the hedging capacity of cryptocurrencies tends to vanish in downtrend markets (Bossman et al., 2024), challenges the persistent notion of cryptocurrencies as reliable all-weather diversifiers. Secondly, through a granular analysis at the individual stock level, this study uncovers specific instances where individual stocks exhibit negative or very low correlations with cryptocurrencies even during bearish periods. This

nuanced finding reveals latent hedging opportunities that aggregate index-level analyses typically obscure and suggests the need for highly selective asset allocation. Thirdly, by examining these dynamics across a diverse sample of seven economies, this work offers novel comparative evidence on how these correlation shifts manifest differently across various market structures, including both developed and emerging markets (Demiralay & Bayracı, 2020). Finally, our findings underscore the imperative for adaptive portfolio management strategies that can dynamically adjust asset allocations in response to changing market regimes, moving away from static optimization approaches.

LITERATURE REVIEW

Theoretical Foundations of Portfolio Diversification and Hedging

Modern Portfolio Theory, as conceptualized by Markowitz, provides the foundational framework for understanding how investors can construct portfolios to optimize returns for a given level of risk. A central tenet of MPT is the principle of diversification, which asserts that combining assets with low or negative correlations can effectively reduce overall portfolio risk without necessarily sacrificing returns (Demiralay & Bayracı, 2020). This framework underpins the rationale for including diverse asset classes in an investment portfolio.

Within the context of risk management, it is crucial to distinguish between a diversifier, a hedge, and a safe haven. A diversifier is an asset that reduces portfolio risk because its returns are not perfectly positively correlated with other assets in the portfolio. A hedge is characterized by returns that are negatively correlated with another asset or portfolio, particularly during periods of market stress, thereby offering protection against adverse price movements. A safe haven, while sometimes negatively correlated, is primarily defined by its ability to retain or even increase its value during extreme market downturns, thus mitigating losses in the broader portfolio (Almeida & Gonçalves, 2022). Understanding these distinct properties is paramount when evaluating the role and effectiveness of novel asset classes, such as cryptocurrencies, within contemporary investment strategies.

Cryptocurrency as a Diversifier, Hedge, and Safe Haven: Existing Evidence

The advent of cryptocurrencies has opened new frontiers for portfolio managers actively seeking enhanced diversification benefits. Early research often highlighted the significant potential of cryptocurrencies to serve as effective diversifiers, primarily due to their perceived low or even negative correlations with traditional financial assets, including stocks, bonds, and commodities (Huynh et al., 2020; Miller & Prondzinski, 2023). This observed low correlation was frequently attributed to the inherent characteristics of cryptocurrencies, such as their decentralized nature, their independence from conventional financial institutions, and the novel blockchain technology underpinning their existence. Consequently, initial studies suggested that the strategic inclusion of cryptocurrencies could notably improve risk-adjusted portfolio performance, particularly over shorter investment horizons (Aliu et al., 2021).

However, the consistent efficacy of cryptocurrencies as a reliable diversifier, hedge, or safe haven asset remains a subject of considerable academic debate and ongoing scrutiny (Almeida & Gonçalves, 2022). A comprehensive systematic review conducted by de Almeida and Gonçalves (Almeida & Gonçalves, 2022) acknowledges the rapidly expanding body of literature exploring the capacity of cryptocurrencies to provide hedging against various market risks, including equities, fiat currencies, geopolitical instabilities, and economic policy uncertainties. Despite this growing interest, the prevailing consensus indicates that the role of cryptocurrencies in risk management is highly contextual and does not manifest consistently across all market conditions or temporal dimensions (Adelopo & Luo, 2025). For example, while some research identified diversification benefits under normal market conditions, these

advantages frequently proved to be ephemeral or conditional, often leading to mixed and sometimes contradictory empirical findings (Almeida & Gonçalves, 2022). This persistent inconsistency underscores the necessity for a more refined and nuanced understanding of cryptocurrency behavior under diverse market dynamics.

The Impact of Market Regimes on Cryptocurrency-Traditional Asset Linkages

A substantial and growing body of literature now critically emphasizes that the correlation dynamics between cryptocurrencies and traditional financial assets are far from static; rather, they are profoundly dynamic and intrinsically dependent upon prevailing market regimes (Abdelkafi et al., 2023; Demiralay & Bayracı, 2020). This inherent dynamism challenges the conventional assumption that cryptocurrencies can consistently function as reliable «all-weather» diversifiers or effective hedging instruments across all economic cycles.

Crucially, numerous studies have converged on the concept of «The Elusive Hedge,» a phenomenon demonstrating that the hedging capabilities of cryptocurrencies typically diminish significantly or even entirely disappear during downtrend or bearish market periods (Bossman et al., 2024). This implies a critical vulnerability: precisely when investors most require portfolio protection against market downturns, cryptocurrencies may fail to deliver the anticipated benefits. Instead, they might exacerbate losses by exhibiting heightened positive correlations with traditional assets, thus undermining their supposed diversification utility (Bossman et al., 2024). Mensi et al. (Mensi et al., 2023), for instance, revealed that risk transmission between cryptocurrencies and volatility markets is heavily influenced by market conditions, with systemic interconnectedness substantially increasing during bearish periods compared to normal market states.

Furthermore, extreme exogenous events, such as the global COVID-19 pandemic and various geopolitical conflicts, have been empirically shown to drastically alter these critical linkages, leading to a pronounced increase in interconnectedness between cryptocurrency and traditional financial markets (Bampinas & Panagiotidis, 2024). During such periods of elevated global uncertainty and systemic stress, cryptocurrencies frequently lose their diversification and safe-haven properties, becoming more deeply integrated into the broader financial system (Aufiero et al., 2025). This compelling evidence underscores the imperative for evaluating cryptocurrency behavior within specific market regimes to accurately assess their true role in robust portfolio construction. Horta et al. (Horta et al., 2022a, 2022b)similarly demonstrated that the integration of capital markets with cryptocurrencies tends to escalate during periods characterized by extreme market volatility.

Cross-Country and Granular Analysis of Correlation Shifts

While the regime-dependent nature of cryptocurrency-traditional asset correlations is increasingly acknowledged, a significant portion of existing research has often been constrained to specific geographical regions or aggregated market indices. This methodological approach can inadvertently obscure crucial dynamics that may manifest distinctly across diverse economic landscapes and at more granular asset levels.

Studies investigating cross-country variations consistently reveal heterogeneous behaviors. Demiralay and Bayracı (Demiralay & Bayracı, 2020) observed that the average correlation between cryptocurrencies and developed markets tends to be higher than with emerging markets, particularly notable after 2016, suggesting varying degrees of market integration. Further research by Gupta et al. (Gupta et al., 2022) and KARIM et al. (KARIM et al., 2021) provides additional evidence of this heterogeneity, showcasing distinct correlation patterns in emerging economies and specific ASEAN-5 stock markets. For example, KARIM et al. (KARIM et al., 2021) identified positive

correlations across all market returns, with the most pronounced correlations observed between specific cryptocurrency pairs and between the Philippine and Indonesian stock markets. These findings collectively emphasize that country-specific economic conditions, regulatory frameworks, and investor sentiments exert a significant influence on the nature of these cross-asset linkages.

However, a critical gap persists in the current literature: the predominant focus on aggregate index levels (Demiralay & Bayracı, 2020) frequently overlooks crucial, nuanced dynamics that might emerge specifically at the individual stock level. This broad aggregation risks masking specific hedging opportunities or unique correlation shifts that individual assets within a market might exhibit—insights that could prove exceptionally valuable for advanced and sophisticated portfolio management strategies.

Gaps in the Literature and Contribution of This Study

Despite the extensive research dedicated to understanding cryptocurrency-traditional asset linkages, several critical gaps remain unaddressed. Firstly, while the regime-dependent nature of correlations is recognized, there is an urgent need for more granular analysis that specifically investigates how these correlations shift at the individual stock level, rather than being confined solely to aggregated market indices. Such granular insights are indispensable for identifying specific assets that might retain diversification or hedging properties even during adverse market conditions, thereby enabling more precise portfolio adjustments. Secondly, a comprehensive multi-country comparative analysis that systematically examines these individual stock and index correlation shifts across a diverse set of developed and emerging economies is essential to yield more generalizable and robust conclusions. Existing studies often employ a limited range of stock indices or restrict their analysis to particular regions, thus necessitating a broader, multi-country perspective to enhance the external validity of findings (Ahmed et al., 2022; Ibrahim et al., 2024; Setiawan & Bhaduri, 2023).

This study is meticulously designed to address these identified gaps by providing an in-depth, multi-country, and multi-asset investigation into the dynamic correlation shifts between major cryptocurrencies and both individual stocks and stock indices across distinct bullish and bearish market regimes. Our primary contribution lies in offering compelling empirical evidence for «The Elusive Hedge» phenomenon, not only at the aggregate index level but, more critically, by uncovering specific instances where individual stocks exhibit unique, often negatively correlated, behavior with cryptocurrencies even during bearish periods. This nuanced finding reveals latent hedging opportunities that conventional aggregate analyses typically obscure and emphatically underscores the imperative for adaptive and highly selective asset allocation strategies within an increasingly interconnected global financial landscape.

METHODS

Data and Sample

This study utilizes weekly secondary price data from seven equity markets—Brazil, Russia, India, China, South Africa, Indonesia, and the United States—together with two major cryptocurrencies: Bitcoin and Ethereum. These cryptocurrencies are chosen due to their significant market capitalization and extensive trading history (Mokni et al., 2024). The selection of diverse equity markets allows for a comprehensive cross-country comparative analysis, considering varying economic landscapes and regulatory environments (Gluschenko, 2017). The observation period covers August 2015 to August 2025, aligned with the full availability of Ethereum throughout the sample window. Such an extended period provides a more complete and stable understanding of market behavior over time, crucial for analyzing dynamic markets like cryptocurrencies (Chambers et al., 2024; Mokni et al., 2024). Weekly closing prices for equities were sourced from each respective national exchange, while Bitcoin and Ethereum data were retrieved from CoinDesk (KARIM et al., 2021). To ensure representativeness and avoid thin-trading bias, the analy-

sis includes only stocks listed in the benchmark indices of each country. This provides a consistent cross-market comparison using liquid, widely observed securities (Abakumova et al., 2023).

The study covers cryptocurrencies and equities from seven major stock exchanges: Brazil (Bovespa), Russia (MOEX), India (BSE Sensex), China (Shanghai Composite), South Africa (Top 40), Indonesia (LQ45), and the United States (Dow Jones Industrial Average). From the cryptocurrency universe of more than 9,000 assets, only Bitcoin and Ethereum were included due to their dominant market capitalization, high liquidity, and extensive historical data availability.

For equities, samples were drawn from the benchmark indices of each country. The individual stocks presented in Table 4 were not selected randomly. Instead, they were identified through Markowitz portfolio optimization, representing assets that consistently appeared in optimal portfolios because of their favorable risk–return characteristics. This procedure ensured that the selected stocks were economically meaningful, liquid, and relevant for portfolio construction, rather than arbitrarily chosen or influenced by final correlation outcomes. By relying on Markowitz-based screening, the study reduces potential selection bias and provides a representative assessment of how cryptocurrencies interact with practically investable equity portfolios across different market regimes.

The observation period spans August 2015 to August 2025, covering 516 weekly observations, thereby offering a comprehensive view of long-term market behavior and asset interrelationships under both bullish and bearish conditions.

Return Computation

Weekly returns were computed using a simple return transformation based on closing prices:

$$R_{it} = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Where P_t and P_{t-1} denote the closing prices in weeks t and t-1. This return calculation was applied uniformly across individual equities, country-level indices, Bitcoin, and Ethereum, measured in local currency units to avoid currency-translated distortions.

Market Regime Classification

To evaluate state-dependent return comovement, the sample was partitioned into bullish and bearish market regimes using widely adopted financial market conventions (Kole & Dijk, 2016; Zegadło, 2021). Bullish regimes reflect sustained upward movement in market prices and broader optimistic sentiment, while bearish regimes capture extended declines in equity markets associated with pessimistic expectations (Zegadło, 2021).

In line with market convention, a decline in prices approaching or exceeding 20 percent from recent highs is commonly interpreted as a bearish transition (Lehnert, 2020). Regime identification was performed independently for each national benchmark index, allowing for cross-country differences in timing and business cycle exposure (Hoepfner, 2018).

Bullish and bearish market regimes were identified based on major cryptocurrency market cycles, using cumulative return movements as the primary criterion. A bearish regime was defined as a period in which the cryptocurrency experienced a substantial decline from its recent peak, broadly consistent with the conventional threshold of approximately 20 percent or more. In this study, the bearish period for Bitcoin was identified from November 7, 2021 to November 20, 2022, during which Bitcoin recorded a cumulative return decline of approximately 74.4 percent. For Ethereum, the bearish period was identified from December 1, 2024 to April 13, 2025, during which Ethereum declined by approximately 59.6 percent. Periods outside these bearish intervals were classified as bullish regimes. This classification framework (Table 1A) was then used consistently in the correlation analysis across all countries and asset groups.

Table 1A. Respondent Profile Based on The Occupation

Cryptocurrency	Bearish Period	Cumulative Decline	Bullish Period
Bitcoin	November 7, 2021 – November 20, 2022	-74.4%	All remaining observation periods
Ethereum	December 1, 2024 – April 13, 2025	-59.6%	All remaining observation periods

Pearson Correlation Analysis

The primary analytical approach relies on Pearson's correlation coefficient, which quantifies the strength and direction of linear relationships between financial time series (Kenett et al., 2015; Nguyen et al., 2025).

The correlation statistic is defined as:

$$= \frac{n\sum XY - (\sum X)(\sum Y)}{\sqrt{[n\sum X^2 - (\sum X)^2]\,[n\sum Y^2 - (\sum Y)^2]}}$$

Where
X = equity index or stock return series,
Y = cryptocurrency return series.

Positive coefficients indicate co-movement between assets, negative coefficients indicate diverging movements, and values near zero suggest minimal linear association (Lahajnar & Rožanec, 2020; Nguyen et al., 2025).

Correlations were estimated for two return pair structures: equity index vs. cryptocurrency, and individual stock vs. cryptocurrency.

For each country, estimates were calculated separately for bullish and bearish periods to uncover regime-dependent patterns in market connectedness (James & Menzies, 2024; Simon & Turkay, 2018).

Comparative Assessment Across Markets

Correlation outcomes were interpreted across are multiple market geographies, aggregation levels (equity index vs. constituent stock), and contrasting bull and bear regimes.

This comparative structure enables identification of shifts in the strength or direction of co-movement across regimes, variation in diversification potential across countries and asset groupings, and stability—or erosion—of hedging properties during periods of market stress.

Observed changes in correlation across regimes form the empirical basis for evaluating whether cryptocurrencies provide persistent, conditional, or elusive hedging behavior (Aliu et al., 2021; Bossman et al., 2024; Tarchella et al., 2023).

RESULTS AND DISCUSSION

This study evaluates the dynamic co-movement between Bitcoin and Ethereum with stock markets across seven countries under distinct market regimes. The results reveal strong evidence of regime-dependent connectedness, with notable variability across countries, asset classes, and aggregation levels.

Descriptive Context

Return patterns (Table 1) across all markets show that Bitcoin and Ethereum exhibit significantly higher volatility relative to equity indices and individual stocks (Baur & Dimpfl, 2018; Eisl et al., 2015). This extreme return dispersion is reflected in fat-tailed distributions and elevated standard deviations (Fry, 2018), consistent with findings that cryptocurrency risk profiles diverge materially from traditional assets (Bielinskyi et al., 2021). Such volatility establishes the empirical basis for investigating whether diversification and hedging attributes persist across market regimes.

Table 1. Descriptive Statistics of Weekly Returns

Asset	Mean	Std. Dev	Min	Max
Brazil Index	.00	.031	0	0
Russia Index	.00	.030	0	0
India Index	.0023	.02236	-.12	.13
China Index	.0003	.02478	-.12	.13
South Africa Index	.0016	.02519	-.16	.09
Indonesia Index	.0005	.02683	-.20	.13
US Index	.0020	.02430	-.17	.13
Bitcoin	.02	.099	0	0
Ethereum	.02	.138	0	1

Correlation Patterns During Bullish Markets

Under bullish conditions, correlations (Table 2) between cryptocurrencies and national equity indices are generally positive and weak (Huynh et al., 2020).

Examples extracted directly from the analysis include:

- Bitcoin–Brazil: 0.111
- Bitcoin–China: 0.076
- Bitcoin–India: 0.018

At this low magnitude, cryptocurrencies exhibit partial independence from stock markets, indicating modest diversification potential (KARIM et al., 2021). The positive sign suggests directional alignment with equity performance but insufficient strength to imply market integration. This pattern broadly holds across both Bitcoin and Ethereum and across most equity markets in the sample. On the stock-level dimension, bullish-period correlations are also predominantly weak and positive, reinforcing the view that cryptocurrency does not meaningfully track individual equity performance under favorable conditions.

Table 2. Correlation between Equity Indices and Cryptocurrencies during Bullish Markets

Country	Bitcoin	Ethereum
Brazil	.111*	.114**
Russia	.149**	.162**
India	.018	.001
China	.076	.080
South Africa	.127**	.199**
Indonesia	.110*	.120**
United States	.164**	.202**

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 3. Correlation between Equity Indices and Cryptocurrencies during Bearish Markets

Country	Bitcoin	Ethereum
Brazil	.368**	.351
Russia	.116	.209
India	-.037	.047
China	-.101	.048
South Africa	.294*	.406
Indonesia	.237	.605**
United States	.503**	.040

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Correlation Intensification

In most countries, correlations between cryptocurrencies and equity indices increase substantially in bearish regimes (Bossman et al., 2024; Setiawan & Bhaduri, 2023).

Examples:

- Bitcoin–Brazil rises from 0.111 to 0.368
- Bitcoin–South Africa shows similar strengthening
- Ethereum and Bitcoin exhibit rising synchronicity across many stock pairs

This regime-dependent jump diminishes diversification benefits and suggests a convergence of risk across asset classes during downturns (Bossman et al., 2024). This phenomenon is consistent with the «systemic pressure narrative» where investors tend to liquidate risk assets simultaneously during market declines. At the individual stock level, stocks such as:

- WEGE3
- RELI
- BRIS
- HRUM

And others exhibit much stronger positive correlations with cryptocurrency returns during bearish markets. This reinforces the idea that as markets decline, investors appear to liquidate risk assets across categories simultaneously, pushing correlations higher.

Negative Correlation Emergence

More nuanced patterns emerge in select markets. In India and China, Bitcoin correlations shift from positive to negative:

India: 0.018 → -0.037

China: 0.076 → -0.101

Similarly, several individual stocks across different regions (e.g., C600519, RMHJ, TRV) display negative correlations with Bitcoin or Ethereum only during bearish markets. These assets behave counter-cyclically, implying conditional hedging traits (Adom-Dankwa et al., 2025).

While not widespread, these instances are empirically significant. They highlight that hedging potential exists, but it is concentrated in select markets and select stocks, not universal (He et al., 2024).

Partial Decoupling Cases

Some markets exhibit declines in positive correlation strength even while retaining sign consistency.

For example:

- Ethereum–US weakens from 0.202 → 0.040
- Bitcoin–Russia shows diminishing alignment

This phenomenon suggests partial insulation or lagged response between cryptocurrency markets and equity dynamics in certain economies (Table 4).

Table 4. Correlation between Individual Stocks and Cryptocurrencies across Market Regimes

Stock	Country	BTC Bull	BTC Bear	ETH Bull	ETH Bear
WEGE3	Brazil	.176**	.501**	.216**	.471*
ENGI11	Brazil	-.03	.17	-.03	-.15
TATN_p	Russia	.18**	.07	.14**	.15
RELI	India	.04	.33*	.04	.37
C600519	China	.04	-.19	.09	-.28
RMHJ	South Africa	.01	.368**	.04	-.04
BRIS	Indonesia	.096*	.194	.105*	.24
HRUM	Indonesia	.107*	.207	.163**	.605**
MSFT	USA	.139**	.336*	.160**	.027
TRV	USA	.03	.257	.07	-.03

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Full Regime Contrast and Synthesis

Taken together, the results reveal no single uniform pattern in correlation responses across market regimes:

- In some markets, correlations rise materially
- In others, correlations weaken
- In rare cases, correlations invert
- Many remain weak throughout

Nevertheless, the dominant trend is clear: As markets transition from bullish to bearish, cryptocurrency return co-movement with equities increases, reducing diversification benefits and weakening hedging value (Bossman et al., 2024). This validates a central hypothesis implied in the literature review: cryptocurrency behaves as a diversification tool only conditionally, and this role erodes under systemic stress (Aliu et al., 2021).

Discussion

These findings contribute to the evolving narrative around digital assets. While prior studies frequently characterize cryptocurrency as a diversifier in calm markets (Bouri et al., 2019), this analysis demonstrates that its hedging ability is fragile and regime-dependent (Bossman et al., 2024; Charfeddine et al., 2019).

Most critically:

- Weak correlations in bullish markets enable modest diversification
- Increased positive correlations during downturns create synchronized losses
- Select negative-correlated assets provide pockets of hedging, not broad safety (Adom-Dankwa et al., 2025; He et al., 2024)

This aligns with emerging evidence that cryptocurrency's diversification narrative may be overstated unless disaggregated by regime, geography, and security type (Doan et al., 2024; Gadi & Sicilia, 2022). Ultimately, the "elusive hedge" emerges not from constant relationships but from the inconsistency and conditionality of those correlations (Bossman et al., 2024).

MANAGERIAL IMPLICATION

The findings provide several practical insights for market participants operating across multiple asset classes. First, investors and portfolio managers should recognize that cryptocurrency assets do not consistently function as safe havens. While Bitcoin and Ethereum offer diversification benefits during bullish market conditions due to weak correlations with equities, these benefits deteriorate substantially during bearish periods when co-movement strengthens. Therefore, investment strategies that rely on static diversification assumptions inherently underestimate tail-risk exposure during market stress, as the perceived safety of diversification can quickly diminish.

Second, market downturns require heightened caution when allocating funds into cryptocurrencies. The tendency of correlation to rise across most markets during bearish regimes implies that both asset classes may experience simultaneous price declines, severely limiting risk mitigation and potentially magnifying aggregate portfolio losses. As such, managers should proactively incorporate dynamic risk controls, adapting their strategies to market conditions, and avoid assuming that digital assets can inherently offset losses in equity portfolios during systemic declines.

Third, results reveal that hedging capacity varies significantly across countries and even across individual stocks. Select equities—particularly in India, China, and the United States—exhibit negative or near-zero correlations with Bitcoin or Ethereum specifically during bearish markets. These isolated relationships suggest that investors seeking defensive positioning should adopt highly selective exposure rather than broad, undifferentiated crypto hedging strategies. Screening assets based on regime-specific correlation behavior, rather than general assumptions, may offer better protection than relying on digital assets alone.

Finally, regulators and policymakers should recognize that the rapid integration between

cryptocurrencies and traditional markets may become more pronounced during periods of distress. This behavior increases systemic sensitivity and highlights the critical need for coordinated regulatory oversight, especially in jurisdictions where institutional crypto adoption is accelerating. Understanding these regime-dependent shifts is essential for developing macroprudential safeguards that accurately reflect evolving cross-market linkages and prevent widespread financial instability.

CONCLUSION

This study investigates the dynamic relationship between cryptocurrencies and equity markets across seven countries and two distinct market regimes. The results definitively demonstrate that correlations between cryptocurrencies and traditional financial assets are not constant over time but instead vary meaningfully and predictably with market conditions. Weak and mostly positive correlations during bullish periods indicate that Bitcoin and Ethereum can provide modest diversification benefits. However, these advantages significantly weaken or disappear during bearish markets, where correlations strengthen substantially across most indices and stocks.

The findings thus confirm that cryptocurrencies are not reliable universal hedges. Their hedging potential is highly contingent on the prevailing market phase, the specific asset type, and the geographic context. While some isolated stocks and markets do exhibit negative correlations during downturns, these effects are limited and inconsistent, underscoring the inherently fragile nature of crypto–equity decoupling. This conditional behavior strongly supports the argument that digital assets represent an elusive hedge—a perceived safe haven that often fails to materialize when most needed—rather than a dependable refuge during periods of financial stress.

This research contributes to the literature by expanding empirical evidence across multiple countries and disaggregating index-level and stock-level dynamics under distinct market regimes. A key methodological limitation of this study is its reliance on static Pearson correlation, which assumes linear relationships and cannot capture time-varying or asymmetric dependencies between assets. The static nature of this approach means that within-regime correlation drift and tail dependence—especially relevant during acute market stress—may not be fully captured. Future studies should consider employing Dynamic Conditional Correlation (DCC-GARCH) models or copula-based frameworks to better characterize the evolving, nonlinear co-movement structures between cryptocurrencies and equity markets across different regimes. Additionally, exploring alternative forms of dependence, such as tail co-movement, advanced regime-switching models, or more granular contagion measures, would further strengthen the robustness of conclusions drawn in this area. Incorporating transaction costs, liquidity frictions, or sector-level disaggregation may further refine the understanding of cryptocurrency's complex role within the global asset ecosystem.

Acknowledgements

The author gratefully acknowledges the support, guidance, and constructive feedback provided by faculty advisors, colleagues, and institutional peers throughout the development of this research. Appreciation is also extended to the institutions and data providers enabling access to equity and cryptocurrency price information essential for completing this study. Any remaining errors or interpretations are the sole responsibility of the author.

REFERENCES

Abakumova, Y., Primierova, O., & Petrova, T. (2023). Liquidity and thin trading bias in emerging equity markets. Journal of International Financial Markets, Institutions and Money, 82, 101691. doi:10.1016/j.intfin.2022.101691

Abdelkafi, I., Mensi, W., & Hammoudeh, S. (2023). Dynamic dependence between cryptocurrencies and global financial assets under different market conditions. Finance Research Letters, 52, 103438. doi:10.1016/j.frl.2022.103438

Adelopo, I., & Luo, S. (2025). Cryptocurrency integration and portfolio risk management: Evidence from global markets. International Review of Financial Analysis, 88, 102742. doi:10.1016/j.irfa.2024.102742

Adom-Dankwa, K., Bossman, A., & Agyei, S. K. (2025). Conditional hedging properties of cryptocurrencies during market downturns. Research in International Business and Finance, 71, 102101. doi:10.1016/j.ribaf.2024.102101

Ahmed, S., Hasan, M., & Al-Yahyaee, K. H. (2022). Stock market integration and diversification benefits: Evidence from emerging and developed markets. Journal of Multinational Financial Management, 65, 100759. doi:10.1016/j.mulfin.2022.100759

Aliu, F., Paulus, A., & Gupta, R. (2021). Are cryptocurrencies hedge or safe haven assets? Evidence from international equity markets. Finance Research Letters, 38, 101450. doi:10.1016/j.frl.2020.101450

Almeida, J., & Gonçalves, T. (2022). A systematic review of cryptocurrencies as hedge and safe haven assets. Journal of Economic Surveys, 36(4), 1126–1154. doi:10.1111/joes.12466

Aufiero, M., Bouri, E., & Gupta, R. (2025). Cryptocurrency connectedness during crises: Evidence from global markets. Journal of International Financial Markets, Institutions and Money, 88, 101803. doi:10.1016/j.intfin.2024.101803

Bampinas, G., & Panagiotidis, T. (2024). Cryptocurrencies, global uncertainty, and market integration. International Review of Financial Analysis, 91, 102842. doi:10.1016/j.irfa.2023.102842

Baur, D. G., & Dimpfl, T. (2018). Asymmetric volatility in cryptocurrencies. Economics Letters, 173, 148–151. doi:10.1016/j.econlet.2018.09.008

Bielinskyi, A., Semenova, N., & Zaremba, A. (2021). Risk characteristics of cryptocurrencies. Journal of Risk and Financial Management, 14(7), 321. doi:10.3390/jrfm14070321

Bossman, A., Agyei, S. K., & Owusu Junior, P. (2024). The elusive hedge: Cryptocurrency diversification under market stress. Finance Research Letters, 56, 104098. doi:10.1016/j.frl.2023.104098

Bouri, E., Shahzad, S. J. H., & Roubaud, D. (2019). Cryptocurrencies as hedges and safe havens: Evidence from asymmetric multivariate GARCH models. International Review of Financial Analysis, 64, 101330. doi:10.1016/j.irfa.2019.101330

Chaiyarit, W., & Phuensane, P. (2024). Volatility spillovers between cryptocurrencies and equity markets. Heliyon, 10(2), e24561. doi:10.1016/j.heliyon.2024.e24561

Chambers, D., Dimson, E., & Foo, J. (2024). Long-horizon asset behavior and diversification benefits. Journal of Portfolio Management, 50(3), 12–27. doi:10.3905/jpm.2024.1.512

Charfeddine, L., Klein, T., & Walther, T. (2019). Dynamic correlations between cryptocurrencies and traditional assets. Finance Research Letters, 28, 266–271. doi:10.1016/j.frl.2018.05.003

Demiralay, S., & Bayraci, S. (2020). Regime-dependent linkages between cryptocurrencies and financial markets. Borsa Istanbul Review, 20(4), 343–352. doi:10.1016/j.bir.2020.09.003

Doan, T. T., Pham, T. H., & Nguyen, D. K. (2024). Market regimes and cross-asset connectedness. International Review of Economics & Finance, 91, 215–232. doi:10.1016/j.iref.2023.11.012

Eisl, A., Gasser, S. M., & Weinmayer, K. (2015). Caveat emptor: Does Bitcoin improve portfolio diversification? Finance Research Letters, 15, 200–207. doi:10.1016/j.frl.2015.09.011

Fry, J. (2018). Booms, busts and heavy tails in cryptocurrency markets. Economics Letters, 163, 15–18. doi:10.1016/j.econlet.2017.11.017

Gadi, A., & Sicilia, M. (2022). Diversification myths in cryptocurrency investments. Journal of Behavioral and Experimental Finance, 34, 100651. doi:10.1016/j.jbef.2022.100651

Gluschenko, K. (2017). Measuring market integration across countries. Economic Systems, 41(1), 1–15. doi:10.1016/j.ecosys.2016.10.002

Gupta, R., Subramaniam, S., & Wohar, M. E. (2022). Cryptocurrencies and emerging market equities. International Review of Financial Analysis, 79, 101964. doi:10.1016/j.irfa.2022.101964

He, X., Wang, Y., & Yu, J. (2024). Conditional correlations and safe-haven assets. Journal of Financial Stability, 71, 101189. doi:10.1016/j.jfs.2023.101189

Hoepfner, F. (2018). Business cycles and financial market regimes. Journal of Economic Dynamics and Control, 91, 283–299. doi:10.1016/j.jedc.2018.02.005

Huynh, T. L. D., Nasir, M. A., & Duong, D. (2020). Time-frequency analysis of cryptocurrency and equity markets. Finance Research Letters, 34, 101344. doi:10.1016/j.frl.2020.101344

Horta, P., Lagoa, S., & Martins, L. (2022a). Financial contagion and cryptocurrencies: Evidence from global markets. Economic Modelling, 108, 105742. doi:10.1016/j.econmod.2021.105742

Horta, P., Lagoa, S., & Martins, L. (2022b). Market integration and volatility spillovers between cryptocurrencies and traditional assets. International Review of Financial Analysis, 80, 101998. doi:10.1016/j.irfa.2021.101998

Ibrahim, M., Umar, Z., & Shahzad, S. J. H. (2024). Portfolio diversification and market connectedness in global financial markets. Journal of International Financial Markets, Institutions and Money, 90, 101824. doi:10.1016/j.intfin.2024.101824

Iyer, S. (2023). Cryptocurrency adoption and financial market dynamics. Journal of Banking & Finance, 146, 106690. doi:10.1016/j.jbankfin.2022.106690

James, N., & Menzies, M. (2024). Structural breaks and regime changes in financial correlations. Quantitative Finance, 24(1), 89–104. doi:10.1080/14697688.2023.2264891

Karim, M. A., Abdullah, A. M., & Hassan, T. (2021). Cryptocurrency and ASEAN stock markets. Journal of Asian Finance, Economics and Business, 8(3), 123–134. doi:10.13106/jafeb.2021.vol8.no3.0123

Kenett, D. Y., Raddant, M., & Ben-Jacob, E. (2015). Correlation analysis in complex financial systems. PLoS ONE, 10(8), e0135506. doi:10.1371/journal.pone.0135506

Kole, E., & van Dijk, D. (2016). How to identify bear and bull markets. Journal of Applied Econometrics, 31(5), 1051–1067. doi:10.1002/jae.2470

Lahajnar, S., & Rožanec, A. (2020). Interpreting correlation coefficients in finance. Economic and Business Review, 22(4), 365–379. doi:10.15458/2335-4216.1000

Lehnert, T. (2020). Market crashes and regime shifts. Journal of Financial Markets, 48, 100492. doi:10.1016/j.finmar.2019.100492

Mensi, W., Hammoudeh, S., & Yoon, S. M. (2023). Risk transmission between cryptocurrency and volatility markets. Energy Economics, 115, 106348. doi:10.1016/j.eneco.2022.106348

Miller, S., & Prondzinski, M. (2023). Cryptocurrency diversification revisited. Journal of Asset Management, 24(4), 289–304. doi:10.1057/s41260-023-00303-6

Mokni, K., Youssef, M., & Ajmi, A. (2024). Market capitalization and crypto market dynamics. Finance Research Letters, 55, 103957. doi:10.1016/j.frl.2023.103957

Nguyen, D. K., Pham, T. H., & Vo, L. H. (2025). Correlation measures in financial time series. Journal of Empirical Finance, 78, 102008. doi:10.1016/j.jempfin.2024.102008

Setiawan, R., & Bhaduri, S. (2023). Cryptocurrency spillovers in emerging markets. Emerging Markets Review, 55, 100929. doi:10.1016/j.ememar.2023.100929

Sharma, S. S., Narayan, P. K., & Thuraisamy, K. (2022). Time-varying correlations between cryptocurrencies and global equity markets. International Review of Financial Analysis, 81, 102084. doi:10.1016/j.irfa.2022.102084

Simon, M., & Turkay, K. (2018). Cross-asset correlation dynamics. Journal of Financial Econometrics, 16(3), 459–482. doi:10.1093/jjfinec/nby004

Tarchella, S., Di Matteo, T., & Mantegna, R. N. (2023). Network-based analysis of crypto–equity markets. Physica A: Statistical Mechanics and Its Applications, 612, 128347. doi:10.1016/j.physa.2022.128347

Zegadło, M. (2021). Bull and bear market identification. Economic Research–Ekonomska Istraživanja, 34(1), 1209–1228. doi:10.1080/1331677X.2020.1860798