Bitcoin Price Associations with Political Polarization, Digital Authoritarianism, Trade Protectionism, Deglobalization, and Language Entropy

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Abstract

This study investigates the socio-political and economic factors influencing Bitcoin prices, focusing on political polarization, protests, digital authoritarianism, trade perfectionism, deglobalization, and language entropy. Using annual data from 2011 to 2022, we find significant positive correlations between Bitcoin prices and these variables. We propose theoretical explanations for these correlations suggesting that Bitcoin's decentralized nature and independence from traditional financial systems make it an attractive hedge against instability and a tool for financial autonomy in a changing global environment. The study also highlights the need for further research to explore the casual mechanisms underlying these relationships and examine other cryptocurrencies' role in these dynamics.

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1. Introduction

Blockchain technology (Halaburda & Haeringer, 2019) and cryptocurrencies have continued to grow and shape the landscape of Web3 (Park & Ozel, 2019; Zhu & Park, 2022). For several reasons, Bitcoin stands out as the most prominent digital currency. Created in 2008 by an unknown person or group under the pseudonym Satoshi Nakamoto, Bitcoin was the first cryptocurrency, establishing itself as the reference point for all subsequent digital currencies (Nakamoto, 2008).

Bitcoin operates on a decentralized network of computers using blockchain technology, which ensures transparency, security, and resistance to censorship. This decentralized nature allows for peer-to-peer transactions without intermediaries like banks or governments. Bitcoin employs cryptographic algorithms and a proof-of-work system to secure the network, making it highly resistant to fraud and hacking, contributing to its widespread adoption.

The fixed supply of Bitcoin, capped at 21 million coins, introduces a scarcity similar to precious metals like gold. This limited supply enhances its value proposition as a store of value and a hedge against inflation. Bitcoin is widely accepted by merchants, businesses, and individuals globally, facilitating various transactions from online purchases to remittances. The growing number of users and participants in the Bitcoin network increases its value and utility, creating a positive feedback loop of adoption and acceptance.

In regions with limited banking infrastructure, Bitcoin provides access to financial services, enabling unbanked and underbanked populations to participate in the global economy. As an investment asset,

Bitcoin has attracted significant attention, with many investors viewing it as digital gold or a hedge against traditional financial market instability (Koutmos, King, & Zopounidis, 2021), resulting in substantial market capitalization and liquidity. Bitcoin's open-source nature has inspired numerous technological innovations within the cryptocurrency space, including creating new digital currencies and implementing advanced blockchain applications. Its extensive media coverage and public attention have also raised awareness and interest in digital currencies, contributing to its widespread recognition and legitimacy.

Despite its prominence among cryptocurrencies (Koutmos, King, & Zopounidis, 2021), the social aspects of Bitcoin and other cryptocurrencies have not been extensively researched (Dodd, 2017). Some studies have investigated the networks of mentions and followers of various cryptocurrencies on Twitter, a primary venue for public discourse about digital currencies (Kim & Park, 2023; Park & Park, 2020; Park & Lee, 2019). Other research has explored psychological variables (Glaser et al., 2014), political ideology (Golumbia, 2016), and the use of cryptocurrencies for illegal activities such as sex and drug financing (Foley, Karlsen, & Putniņš, 2019). Macro-level social, governmental, and political processes associated with Bitcoin merit investigation.

2. Macro-Sociall Bitcoin Variables of Interest

The relationships between Bitcoin values and various macroeconomic and socio-political variables, such as political polarization, protests, digital authoritarianism, trade protectionism, deglobalization, and language entropy, are productive for theory. Bitcoin is uniquely positioned to interact with these variables as a decentralized digital currency, reflecting broader economic and political trends. Explaining the connections benefits theorizing about Bitcoin's social aspects.

Political polarization is the growing ideological distance between political parties and the resultant societal divide. This polarization and protests can increase uncertainty and volatility in traditional financial markets, making alternative assets like Bitcoin more attractive to investors seeking stability and insulation from political risks (Yermack, 2015). Bitcoin's appeal in polarized environments lies in its decentralized nature and independence from central bank policies (Bauer et al., 2018), safeguarding against potential economic disruptions caused by political instability. However, Bitcoin's volatility and the evolving regulatory landscape introduce unique risks and uncertainties (Glaser et al., 2014). Despite this, its growing acceptance and potential for portfolio diversification continue to attract investors seeking refuge from traditional market turbulence (Dyhrberg, 2016).

Digital authoritarianism, characterized by authoritarian regimes' use of digital technologies to monitor, repress, and manipulate populations, may also positively correlate with Bitcoin and other digital currency adoption (Bell, 2021). The prospect of cryptocurrency use to circumvent digital authoritarianism is perhaps why the People's Republic of China (PRC) is shaping its vision of Web3 according to its principles of authoritarian rule—outlawing uncontrollable technologies like cryptocurrencies (Harsono, 2022). In such regimes, Bitcoin offers a form of financial freedom and privacy that is not easily controlled or surveilled by the state (Dyhrberg, 2016), making it an appealing option for individuals seeking to protect their wealth and conduct transactions anonymously (Nakamoto, 2008).

Trade protectionism, which involves implementing tariffs and other trade barriers to protect domestic industries, has been linked to increased interest in cryptocurrencies. Protectionist policies can lead to economic uncertainty and restricted access to international markets, prompting businesses and individuals to seek alternative means of conducting transactions and preserving value (Antonopoulos, 2016; Ammous, 2018). Bitcoin, with its global accessibility and resistance to trade barriers, offers a hedge against the risks associated with trade protectionism and economic nationalism.

Deglobalization, diminishing interdependence, and integration between global economies further contribute to the growing interest in cryptocurrencies. As countries become more isolated and global trade diminishes, traditional financial markets may experience volatility and reduced liquidity. Bitcoin, which operates independently of national borders and regulatory regimes, presents an attractive alternative for preserving wealth and facilitating cross-border transactions without reliance on conventional banking systems (Vijaya, Prabhu, Sandhya, & Aldehayyat, 2024).

Language entropy, reflecting the diversity and distribution of languages used in communication, can indicate cultural and informational fragmentation. High language entropy suggests a more fragmented and diverse communicative landscape, which may correlate with reduced trust and cohesion within and between societies. In such an environment, Bitcoin's universal acceptance and usability across linguistic and cultural boundaries enhance its appeal as a global currency (Nakamoto, 2008). This study aims to explore the interrelationships between Bitcoin and these macroeconomic and socio-political variables. By examining how the Bitcoin index correlates with political polarization, digital authoritarianism, trade protectionism, deglobalization, and language entropy, this research seeks to uncover underlying theoretical explanations for these correlations. Understanding these dynamics is crucial for policymakers, investors, and scholars seeking to navigate the evolving landscape of global finance and politics.

Based on the above theoretical reasoning, the following hypotheses are tested with annual data from 2011 to 2022 using year as the unit of analysis:

H1: Bitcoin price is positively associated with political polarization. H2: Bitcoin price is positively associated with protests. H3: Bitcoin price is positively associated with digital authoritarianism. H4: Bitcoin price is positively associated with trade protectionism. H5: Bitcoin price is positively associated with deglobalization. H6: Bitcoin price is positively associated with language entropy.

3. Methods

3.1 Data Collection

The analysis utilized various data sources to produce yearly communication measures about deglobalization, protests, and digital authoritarianism from public and group posts on Facebook, Google searches, and Nexis Uni searches of news articles, major world publications, and the New York Times. Additionally, data on trade protections was obtained from Global Trade Alert (https://www.globaltradealert.org/) (Danowski & Park, 2024).

This study also gathered historical Facebook posts for each year using Meta's CrowdTangle (https://www.crowdtangle.com/) to track deglobalization trends, focusing on public and group posts. This search yielded over 7 gigabytes of data, which included a wide array of content, indicating a high diversity of topics—a beneficial characteristic for statistical analysis.

For the linguistic analysis of these posts, we utilized FastText through an R script, which allowed us to determine the probability distribution of 157 languages for each line of text. This method provided a robust framework for understanding the multilingual dynamics of the online discourse related to deglobalization, protests, and digital authoritarianism. Shannon's (1948) entropy statistic operationalized language entropy. To operationalize political polarization, protests, and digital authoritarianism (which includes Internet censorship and shutdowns), we conducted annual searches using CrowdTangle, Google, and Lexis Nexis from 2011 to 2022. This longitudinal approach enabled us to track changes over time and provided a comprehensive view of how these variables evolved in response to global events.

The term "communication" was selected for the CrowdTangle searches used to index language entropy, given its centrality in Information Society conceptualizations and because it was in the same family of concepts of the other communication variables, political polarization, protests, and digital authoritarianism. The communication variables from the various searches from different sources were operationalized as each search result's file size in the number of megabytes from the various searches for deglobalization mentions and political polarization, protests, and digital authoritarianism.

We obtained data on trade protectionism from the Global Trade Alert database (https://www.globaltradealert.org/). This source provided detailed records of trade interventions, allowing us to examine the extent and impact of trade protection measures over the years. By integrating this data with the various communication measures, we could investigate the relationship between trade policies and social dynamics, such as deglobalization mentioned in various sources, political polarization, protests, and digital authoritarianism.

Bitcoin data was produced by annualizing the monthly graph shown in Figure 1 (https://calendar.bitbo.io/price/). Although Bitcoin launched in 2008 (Nakamoto, 2008), the early years saw very low prices. Beginning in 2011, there was an initial surge in price. Accordingly, this analysis considered annual data from 2011 to 2022, the last year for which the other variables were available (Danowski & Park, 2024).

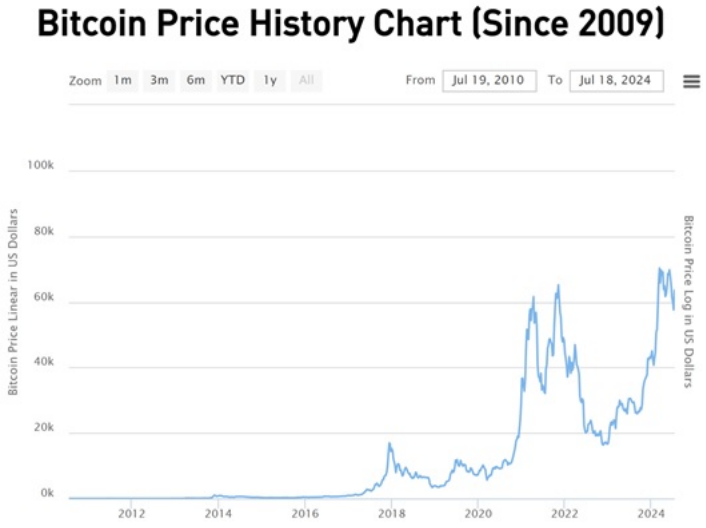

Figure 1: Bitcoin Price History Chart (Since 2009)

4. Results

BITCOIN	POLAR	PROTESTS	DIGITAL_AUTH	DEGLOBALIZATION	PROTECTIONS
BITCOIN	—				
POLARIZATION	.969**	—			
PROTESTS	.0.492	.604*	—		
DIGITAL_AUTH	.0.800**	.773*	.815**	—	
DEGLOBALIZATION	.650*	660*	.878**	.950**	—
PROTECTIONS	.822**	.697*	.563**	.879**	.768**

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

Table 1: Correlations

The findings of this study reveal a significant positive correlation between Bitcoin prices and several socio-political and economic variables, including political polarization, digital authoritarianism, trade protectionism, deglobalization, and language entropy. These results suggest theoretically interesting technological, economic, and political interactions in the contemporary global landscape.

Significant positive correlations between the Bitcoin index and these variables support five hypotheses. Theoretically, these correlations can be explained through the following concepts. This treatment is based on the assumption that Bitcoin price is considered a measure of the demand for the cryptocurrency. As political polarization, digital authoritarianism, trade protectionism, deglobalization, and language entropy increase, so does Bitcoin's perceived value and demand, reflecting its role as a hedge against instability and a tool for financial autonomy in a changing global environment.

4.1 Bitcoin and Political Polarization

The increasing mistrust in traditional financial and political institutions during heightened political division can explain the positive correlation between Bitcoin prices and political polarization. As societies become

more polarized, individuals may seek alternative financial systems perceived as independent of state control and influence. Decentralized Bitcoin offers an appealing option for those disillusioned with conventional financial institutions. This aligns with Iyengar, Sood, and Lelkes's (2012) findings, who noted that polarization drives individuals toward alternative economic and social structures.

4.2 Bitcoin and Protests

Although the correlation between Bitcoin price and protests is moderate and in the right direction, it is insignificant. Several factors could contribute to this moderate and non-significant correlation. First, the accessibility and understanding of Bitcoin and cryptocurrency technology may not be uniform across protest demographics. Individuals with limited access to technology or low levels of digital literacy might find it challenging to adopt Bitcoin during periods of unrest.

Second, the immediacy and urgency of financial needs during protests might lead individuals to prefer more readily accessible forms of currency or assets that can be quickly converted into goods and services. With its sometimes volatile price and need for technological infrastructure, Bitcoin might not always be the most practical option in such scenarios.

Third, government responses to protests can vary widely. In some cases, authorities might restrict access to the internet or financial networks, making it difficult for protesters to use Bitcoin. On the other hand, in more open or technologically advanced societies, adopting Bitcoin during protests might be more feasible. It could show a stronger correlation in specific contexts.

Lastly, the visibility and narrative around Bitcoin as a tool for resistance or autonomy might not be strong enough to influence its widespread use in protests. Also, protests are typically short-term events, and the time scale for Bitcoin price changes may not align.

4.3. Bitcoin and Digital Authoritarianism

The association between Bitcoin prices and digital authoritarianism indicates cryptocurrencies' dual role in repressive regimes. On one hand, digital authoritarianism involves state control over digital communications and financial transactions, prompting citizens to turn to decentralized currencies like Bitcoin to evade surveillance and maintain financial privacy. On the other hand, as states clamp down on digital freedoms, the demand for untraceable financial instruments grows, thereby driving up Bitcoin prices. This dynamic is supported by the work of Shen (2016), who discussed the rise of digital authoritarianism and its impact on alternative digital tools.

4.4. Bitcoin and Trade Protectionism

The correlation between Bitcoin prices and trade protectionism can be attributed to the uncertainties and economic disruptions caused by protectionist policies. Trade tariffs and barriers can lead to market volatility and currency devaluation, pushing investors to seek refuge in stable, borderless financial assets like Bitcoin. Al-Sadiq (2021) found that economic policies significantly influence investment behaviors, further supporting that protectionist measures can increase Bitcoin's attractiveness as a hedge against economic instability.

4.5. Bitcoin and Deglobalization

Deglobalization trends, marked by retreats from international cooperation and global economic integration, have a complex relationship with Bitcoin. As global trade and cooperation decline, economic uncertainties rise, increasing interest in decentralized financial systems that are not tied to any single economy. This is consistent with the findings of Irwin (2020), who observed that deglobalization trends often lead to the search for alternative economic solutions, including cryptocurrencies.

4.6 Bitcoin and Language Entropy

Language entropy, representing the diversity and complexity of language use in digital communications, positively correlates with Bitcoin prices. This can be interpreted as a reflection of the global and multicultural nature of Bitcoin users and the cryptocurrency community. As digital communication becomes more fragmented and diverse, Bitcoin's global reach and acceptance grow, driving its demand and value. The study by Gullifer and Titone (2020) supports this notion by highlighting the role of linguistic diversity in shaping digital communication networks and economic behaviors.

5. Discussion

The findings motivate the following theory and explanatory concepts. The points raised suggest new areas for future research.

5.1 Polarization

Increased political polarization often leads to economic and policy uncertainty. Investors may turn to alternative assets like Bitcoin to hedge against this uncertainty. As political polarization intensifies, confidence in traditional financial systems and government policies may wane, prompting a shift toward decentralized and perceived safe-haven assets such as Bitcoin (Baur & Dimpfl, 2018; Aysan, Demir, Gozgor, & Lau, 2019).

5.2 Digital Authoritarianism

In environments where digital authoritarianism, including censorship and surveillance, is rising, individuals and entities may seek more secure and private means of conducting transactions. Bitcoin offers a degree of anonymity and is decentralized, making it attractive in authoritarian regimes where financial privacy is compromised (Zohar, 2015; Raskin & Yermack, 2018).

5.3 Trade Protectionism

Trade protectionism can lead to economic inefficiencies and reduced international trade, causing investors to look for non-traditional investment opportunities. As trade barriers increase, global economic integration decreases, leading investors to diversify their portfolios with assets like Bitcoin, which are not directly affected by trade policies (Baur, Hong, & Lee, 2018; Gozgor & Demir, 2018).

5.4 Deglobalization

The process of deglobalization, characterized by the fragmentation of international economic systems, may drive investors toward globally accessible digital currencies. As international economic ties weaken (James, 2018), there may be a reduced faith in fiat currencies and traditional investments tied to national economies. Due to its global nature and independence from any single country's economy, Bitcoin is a more attractive option.

5.5 Language Entropy

High language entropy reflects a diverse and fragmented communication landscape, often indicative of broader societal and economic fragmentation. In highly fragmented communication environments (Choi & Danowski, 2002), traditional financial systems may struggle with inefficiencies and lack of coherence,

prompting a shift to Bitcoin, which transcends linguistic and cultural barriers and operates on a unified technological platform.

5.6 Resilience Against Centralized Control

Bitcoin's decentralized nature is fundamentally appealing when centralized control is perceived as problematic or risky. As trust in centralized institutions (governments, banks, international trade organizations) decreases due to polarization, authoritarianism, protectionism, and deglobalization, Bitcoin's trustless and secure system becomes more attractive. Bitcoin's adaptability and underlying blockchain technology allow it to thrive in diverse and rapidly changing environments, making it a resilient asset amidst global instability.

5.7 Safe-Haven Asset

Economic Theory states that assets considered safe havens tend to increase in value during economic or political turmoil. Bitcoin is increasingly viewed as a digital gold, a safe-haven asset that preserves value in times of crisis, thereby attracting investment during periods marked by the variables mentioned (Bouri, Molnár, Azzi, Roubaud, & Hagfors, 2017; Dyhrberg, 2016).

5.8 Speculative Behavior

Speculative investments are often driven by behavioral factors, including herd behavior (Danowski, Gluesing, & Riopelle (2011) and the fear of missing out (FOMO (Song, et al., 2024). In times of uncertainty and increased risk (e.g., due to polarization or protectionism), speculative behavior can drive up Bitcoin prices as more investors jump on the bandwagon, seeking high returns and protection against traditional market volatility (Urquhart, 2016; Yermack, 2015). The theory and explanations offered point to future research to assess the empirical evidence for the reasoning. Additional future research directions are as follows.

5.9 Future Research and Directions

Future studies should investigate the causal mechanisms underlying the observed correlations. Specifically, the research could explore how political, economic, and digital landscape shifts directly impact Bitcoin adoption and valuation. Moreover, examining the role of other cryptocurrencies in these dynamics could provide a more comprehensive understanding of the broader digital currency market. Finally, expanding the scope of analysis to include different regions and economic contexts would enhance the generalizability of the findings.

5.10 Limitations

Despite the robust findings, this study has several limitations. The number of annual data points from the longitudinal data is small and does not provide for a robust panel analysis. The data limits the ability to draw causal inferences. Future research should employ longitudinal designs to better capture the dynamic relationships between these variables over time. Rather than a yearly interval, monthly data would support panel analysis to reveal time-ordered relationships suggestive of causality. Additionally, the study relies on aggregate data, which may obscure important nuances at the country level. Further research could benefit from more granular data to explore these relationships further.

5.11 Conclusion

In conclusion, this research contributes to the growing literature on the relationship between Bitcoin and various socio-political and economic factors. It highlights the need to explore these dynamics further to develop a comprehensive understanding of the factors influencing the cryptocurrency market. The positive correlations identified in this study underscore the importance of considering the broader socio-political context in discussions about Bitcoin and its role in the global economy.

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