

The Case for Bitcoin as a Reserve Asset

Matthew Ferranti



October 2024

The Case for Bitcoin as a Reserve Asset

About the Author



Matthew Ferranti is an economist for the US Intelligence Community. Previously, Dr. Ferranti completed a rotation at the White House Council of Economic Advisers. Dr. Ferranti's research about international finance has been featured in Forbes and Politico, among other venues. Dr. Ferranti received his PhD in Economics from Harvard University in 2023, where his studies were supported by a National Science Foundation Graduate Research Fellowship.

Disclaimer: The views expressed in this article are the author's own and do not reflect those of the US Government.

About the Bitcoin Policy Institute

The Bitcoin Policy Institute (BPI) is a non-partisan, non-profit think tank. It is dedicated to educating policymakers and the public on Bitcoin and disruptive digital technologies, providing research-based insights to inform sound policy in the United States.

The BPI team comprises experts in economics, law, philosophy, energy, and environmental science, working together to explore the impacts of new technology on existing US public policy interests. The views expressed in this publication do not necessarily reflect the views of Bitcoin Policy Institute management or its affiliated scholars.





The Case for Bitcoin as a Reserve Asset

Matthew Ferranti

October 2024

Table of Contents

1	Introduction	1
2	Historical Position	2
3	Performance During Times of Crisis	3
4	Long-term Store of Value / Inflation Hedge	5
5	Effective Portfolio Diversifier	6
6	No Default Risk	8
7	Highly Liquid Asset	10
8	Serves as a Geopolitical Diversifier	11
9	Conclusion	12

Figures

Figure 1	Failure of Silicon Valley Bank Increases Bitcoin's Price	3
Figure 2	US Sanctions on Russia's Central Bank Increase Bitcoin's Price	4
Figure 3	Correlations Between Bitcoin and Traditional Reserve Assets Are Low	7
Figure 4	Bitcoin Exchange Volumes Are Sufficient to Accommodate Central Bank Purchases	10

1

Introduction

Central banks hold about \$12.3 trillion in foreign exchange reserves, as of Q1 2024,¹ in addition to about \$2.2 trillion of gold.² Many countries, especially emerging economies, use foreign exchange reserves to pay for imports, stabilize their currencies, ensure the timely payment of foreign currency-denominated debt, and smooth the effect of economic shocks.

Central banks have recently been expanding their gold holdings. Accounting for unreported purchases known to industry insiders, sovereign holdings of gold in Q3 2023 passed their previous high set in 1965.³ Academic research suggests that some countries may under-report their gold holdings in order to minimize public criticism of their investment decision at times when the price of gold declines.⁴

Only one central bank has publicly announced the addition of Bitcoin to its sovereign reserves: El Salvador. As of October 2024, El Salvador owned⁵ 5,917 bitcoin worth about \$407 million in addition to \$3.1 billion of foreign currency reserves and gold.^{5,6} Portfolio optimization suggests an optimal Bitcoin reserve allocation ranging from 2%-5%.⁷ It is possible that other countries have quietly added Bitcoin to their sovereign wealth funds, which have far fewer disclosure requirements compared to central bank reserves.

In the following sections, I outline the top reasons that central banks choose to hold gold, according to the World Gold Council 2024 central bank survey, and discuss the extent to which those reasons also justify a central bank allocation to Bitcoin. I argue that Bitcoin is a reserve asset—analogueous in some respects to gold—and some central banks might consider adding Bitcoin to their reserves. This paper primarily focuses on Bitcoin's role as a store of value, and does not discuss whether Bitcoin possesses other characteristics of money.

-
- 1 International Monetary Fund. (Q1 2024). Currency Composition of Official Foreign Exchange Reserves (COFER). <https://data.imf.org/COFER>
 - 2 World Gold Council. (Q1 2024). Gold Reserves By Country. <https://www.gold.org/goldhub/data/gold-reserves-by-country>
 - 3 Nieuwenhuijs, J. (2023). 'Estimated World Official Gold Holdings Reach Record High.' Gainesville Coins. <https://www.gainesvillecoins.com/blog/estimated-world-official-gold-holdings-reach-record-high>
 - 4 Aizenman, J. and Inoue, K. (2013). 'Central banks and gold puzzles.' *Journal of the Japanese and International Economies*, 28(C), 69-90.
 - 5 El Salvador National Bitcoin Office. (2024). <https://bitcoin.gob.sv>
 - 6 Central Reserve Bank of El Salvador. (2024). https://estadisticas.bcr.gob.sv/cartelera_en.html
 - 7 Ferranti, M. (2024). 'Hedging Sanctions Risk: Cryptocurrency in Central Bank Reserves.' SSRN. Working Paper.

2

Historical Position

Satoshi Nakamoto published the whitepaper describing the workings of Bitcoin in 2008. But Bitcoin’s roots can be traced back to the Industrial Revolution, when the invention of electricity transformed the process of economic production. Since then, the consumption of electricity has become so essential to the global economy that some academic researchers use nighttime luminosity—measured from space—as a proxy for economic performance.^{8, 9}

As the classic form of hard money, gold requires physical work to extract, refine, validate, and transfer from one entity to another. Gold is both finely divisible and chemically durable, so gold can be readily minted into various standardized denominations, serving as a long-lasting store of value.¹⁰

The Industrial Revolution created a new possibility, in which the creation and validation of currency could consume electricity rather than rely upon physical work at the currency’s location, as in the case of gold. Given the centrality of electricity in the modern economy, it is logical that the production of a post-Industrial Revolution store of value would be fundamentally connected to the consumption of electricity. This is one key innovation behind Bitcoin: miners consume electricity to generate new Bitcoin.

Bitcoin solves one problem that still plagues gold: counterfeiting. The list of fake substitutes for gold is long, including pyrite, brass, and even gold-plated tungsten. Bitcoin is self-authenticating in the sense that the same electricity that mints new Bitcoin also validates transactions in existing Bitcoin via publication in a secure public registry.

Although any proof-of-work cryptocurrency could be viewed as similarly innovative—requiring electricity rather than physical work to mint and transfer—Bitcoin is unique because Bitcoin is the first proof-of-work cryptocurrency.¹¹ Bitcoin’s legitimacy is derived from its originality. Likewise, originality explains why gold is a reserve asset, but platinum is not. Platinum is a rare heavy metal that is both malleable and chemically stable, similar to gold. But platinum is not a reserve asset because platinum has not been used as a form of money for thousands of years.

8 Henderson, J. V., Adam Storeygard, and David N. Weil. (2012). ‘Measuring Economic Growth from Outer Space.’ *American Economic Review*, 102(2), 994-1028.

9 Chor, D. and Bingjing, L. (2021). ‘Illuminating the Effects of the US-China Tariff War on China’s Economy.’ *NBER*. Working Paper No. 29349.

10 Alchian, A. (1977). ‘Why Money?’ *Journal of Money, Credit, and Banking*, 9(1), 133-140.

11 Bailey, A. M., Bradley Rettler, and Craig Warmke. (2024). ‘Resistance Money.’ Routledge.

3

Performance During Times of Crisis

A key characteristic of a reserve asset is that the reserve asset provides a form of insurance by producing positive returns when other assets perform poorly. For example, a ‘flight to safety’ effect typically causes the US dollar to appreciate during times of economic turmoil as investors exchange riskier assets for safer assets.

Bitcoin is substantially more volatile than all other reserve assets, if volatility is measured over short time periods, such as daily returns. Furthermore, Bitcoin performed poorly during the onset of the COVID-19 pandemic. The price of Bitcoin collapsed nearly 45% between March 6, 2020 and March 16, 2020.

But no asset provides insurance against all types of economic shocks. For example, nominal US Treasury bonds perform poorly in response to inflation shocks. And Bitcoin has historically performed well during two types of economic crises: those related to US bank failures and large-scale US financial sanctions. Bitcoin provides some insurance benefits that other assets do not.

Figure 1: Failure of Silicon Valley Bank Increases Bitcoin’s Price



In this figure, the solid gray vertical line denotes the time when US financial regulators closed Silicon Valley Bank.

Source: Bitstamp,¹² AFP,¹³ author's calculations

¹² Hourly Bitcoin price data from the Bitstamp exchange. <https://www.cryptodatadownload.com/data/bitstamp/>

¹³ @AFP. <https://x.com/AFP/status/1634237444936613904>

Figure 2: US Sanctions on Russia's Central Bank Increase Bitcoin's Price



In this figure, the solid gray vertical line denotes the time of the Russian invasion of Ukraine in 2022. The dashed gray vertical line marks the time when the US implemented sanctions on the Central Bank of Russia.

Source: Bitstamp,¹⁴ OFAC,¹⁵ CNN,¹⁶ author's calculations

-
- 14** Hourly Bitcoin price data from the Bitstamp exchange. <https://www.cryptodatadownload.com/data/bitstamp/>
- 15** OFAC Directive 4 under E.O. 14024. (2022). 'Prohibitions Related to Transactions Involving the Central Bank of the Russian Federation, the National Wealth Fund of the Russian Federation, and the Ministry of Finance of the Russian Federation.'
- 16** Lister, T., Tara John, and Paul P. Murphy. (2022). 'Here's what we know about how Russia's invasion of Ukraine unfolded.' CNN. <https://www.cnn.com/2022/02/24/europe/ukraine-russia-attack-time-line-intl/index.html>

4

Long-Term Store of Value / Inflation Hedge

It is difficult to determine whether Bitcoin acts as a long-run inflation hedge, because the relationships among financial variables can change over time, and even assets that are long-term stores of value can experience decades of underperformance. For example, gold experienced an 86% decline in its inflation-adjusted value from its peak in January 1980 until its trough in April 2001. So gold only acts as an inflation hedge over very long time periods, such as centuries. Academic researchers have noted that the price of bread, measured in gold, is about the same today as it was during the Roman Empire. Also, the wage of a Roman centurion, measured in gold, is about the same as that of a US Army captain.¹⁷

Ultimately, the finite supply of Bitcoin—with the quantity of newly-minted Bitcoin halving every four years—probably provides some protection from inflation. Research suggests that changes in the price of Bitcoin tend to predict changes in expected inflation.¹⁸ Moreover, measured at a weekly frequency, Bitcoin prices appreciate in response to increases in an online price index.¹⁹

¹⁷ Erb, C. and Harvey, C. (2016). 'The Golden Constant.' *The Journal of Investing*, 94-100.

¹⁸ Blau, B. M., Todd G. Griffith, and Ryan J. Whitby. (2021). 'Inflation and Bitcoin: A descriptive time-series analysis.' *Economics Letters*, 203, 109848.

¹⁹ Choi, S. and Shin, J. (2022). 'Bitcoin: An inflation hedge but not a safe haven.' *Finance Research Letters*, 46(B), 102379.

5

Effective Portfolio Diversifier

If Bitcoin is to be an effective portfolio diversifier, Bitcoin's returns should be driven by different macroeconomic forces than those that influence other reserve assets. In an event study analyzing 30-minute windows around the release of economic news, researchers at the Federal Reserve Bank of New York found that the price of Bitcoin is unrelated to all types of macroeconomic news except news related to inflation.²⁰ The researchers were particularly puzzled by a lack of relationship between interest rates and Bitcoin prices. However, the authors found significant relationships between various types of economic news and gold prices, suggesting that Bitcoin can provide diversification benefits in a portfolio containing gold, because Bitcoin prices are not driven by the same macroeconomic forces as gold prices.

Looking beyond the variance of Bitcoin, the total volatility of a reserve portfolio containing a small Bitcoin allocation is mostly determined by Bitcoin's correlation with the other assets in the portfolio. So Bitcoin is particularly valuable as a portfolio diversifier if Bitcoin's correlation with traditional reserve assets is low.

Prior to the COVID-19 pandemic, the correlations among Bitcoin and other reserve assets were near zero. But, during the pandemic, the Bitcoin-stock correlation rose.²¹ Some researchers have suggested that the rising Bitcoin-stock correlation was a result of trading by institutional investors, whose participation in the crypto markets has probably contributed to a decline in crypto volatility since Bitcoin's inception.²² Other researchers argue that the Bitcoin-stock correlation was a result of trading by retail investors.²³ Regardless of the explanation, the Bitcoin-stock correlation declined in 2023 from its pandemic high, as shown in Figure 3.

Undoubtedly, Bitcoin does not diversify against all types of economic shocks. But the fact that Bitcoin's performance is not connected to macroeconomic fundamentals in the same manner as other financial assets suggests that Bitcoin can provide diversification benefits.

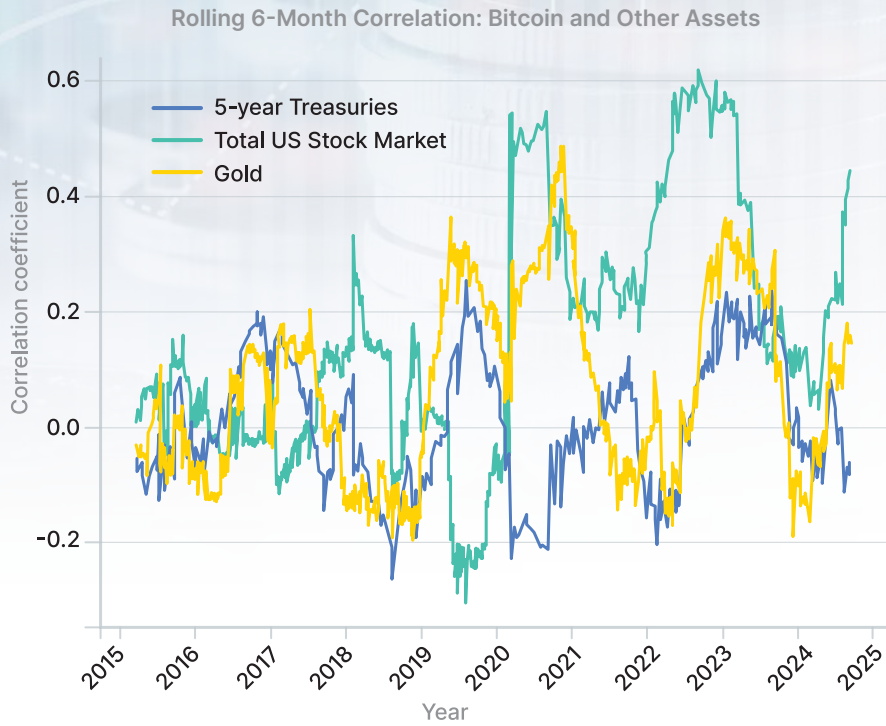
20 Benigno, G. and Rosa, C. (2023). 'The Bitcoin-Macro Disconnect.' *Federal Reserve Bank of New York Staff Reports No. 1052*.

21 Adrian, T., Tara Iyer, and Mahvash S. Qureshi. (2022). 'Crypto Prices Move More in Sync With Stocks, Posing New Risks.' *IMF Blog*. <https://www.imf.org/en/Blogs/Articles/2022/01/11/crypto-prices-move-more-in-sync-with-stocks-posing-new-risks>

22 Dong, S., Vivian W. Fang, and Wenwei Lin. (2023). 'Tracing Contagion Risk: From Crypto or Stock?.' SSRN Working Paper.

23 Didisheim, A. and Somoza, L. (2022). 'The End of the Crypto-Diversification Myth.' *SSRN Working Paper*.

Figure 3: Correlations Between Bitcoin and Traditional Reserve Assets Are Low



Source: investing.com,²⁴ author's calculations

²⁴ Daily price data for Bitcoin, Gold, the Schwab Intermediate-Term US Treasury ETF, and the Vanguard Total Stock Market Index Fund ETF.

6

No Default Risk

Bitcoin lacks default risk, because Bitcoin does not represent a claim on future cash flows, unlike bonds or stocks. The mining process cryptographically guarantees the security of Bitcoin.

Financial sanctions are closely related to the concept of default. Sanctions can be considered a form of selective default, preventing the target from receiving the cash flows derived from the sanctioned assets. But the Bitcoin blockchain is resistant to financial sanctions, because miners are financially incentivized to process on-chain transactions. Even if a group of miners refuse to process transactions to or from a particular wallet, the owner of that wallet can offer a higher transaction fee to motivate other miners—who may be located in jurisdictions that do not enforce the sanctions at issue—to process the proscribed transactions.

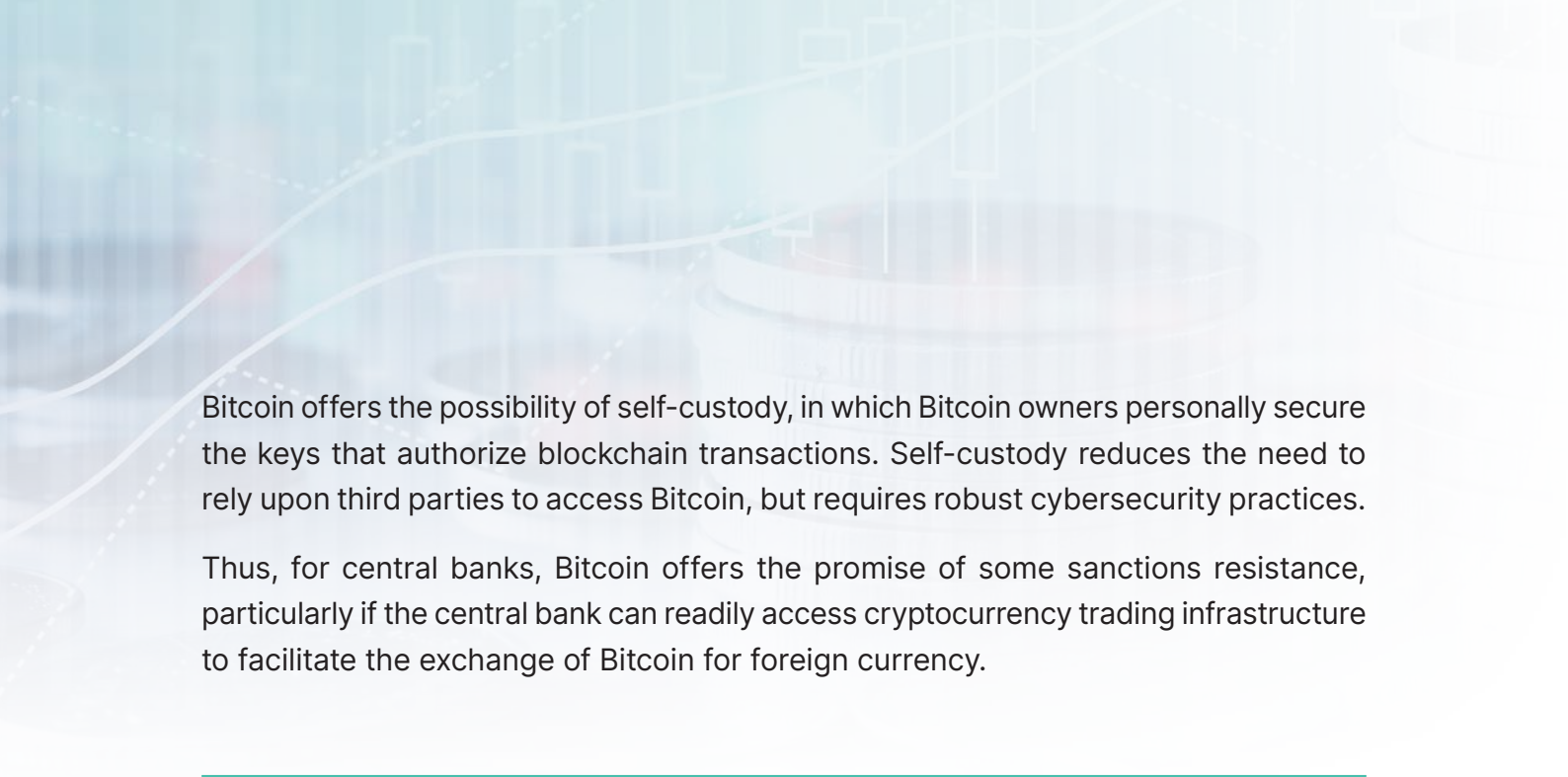
Although financial sanctions cannot block on-chain transactions, sanctions can potentially motivate the willingness of third parties to transact with sanctioned entities. The blockchain analytics company Chainalysis pointed out that US sanctions against the cryptocurrency mixing service Tornado Cash were largely effective, not because the sanctions prevented Tornado Cash from operating, but because Tornado Cash's users feared the legal consequences of being associated with sanctions violation.²⁵ On the other hand, inflows to the Russian cryptocurrency exchange Garantex actually increased following US sanctions. Garantex promised to continue operating regardless of the US sanctions, potentially reassuring some darknet marketplaces that Garantex would not attempt to seize their funds.

Another type of default risk pertains to the custodians of investment assets. Many central banks entrust their investments to the custody of third parties, such as the Federal Reserve Bank of New York.²⁶ These custodians sometimes choose to freeze their accountholders' assets. For example, in 2023, the Venezuelan Central Bank lost a court battle to unfreeze nearly \$2 billion of its gold deposited at the Bank of England.²⁷

²⁵ Chainalysis. (2023). 'How 2022's Biggest Cryptocurrency Sanctions Designations Affected Crypto Crime.' <https://www.chainalysis.com/blog/how-2022-crypto-sanction-designations-affected-crypto-crime/>

²⁶ Federal Reserve Bank of New York. (2024). 'Central Bank & International Account Services.' <https://www.newyorkfed.org/markets/central-bank-and-international-account-services>

²⁷ Reuters. (2023). 'Venezuela loses UK appeal in long-running gold reserves battle.' <https://www.reuters.com/markets/commodities/venezuela-loses-uk-appeal-long-running-gold-reserves-battle-2023-06-30/>



Bitcoin offers the possibility of self-custody, in which Bitcoin owners personally secure the keys that authorize blockchain transactions. Self-custody reduces the need to rely upon third parties to access Bitcoin, but requires robust cybersecurity practices.

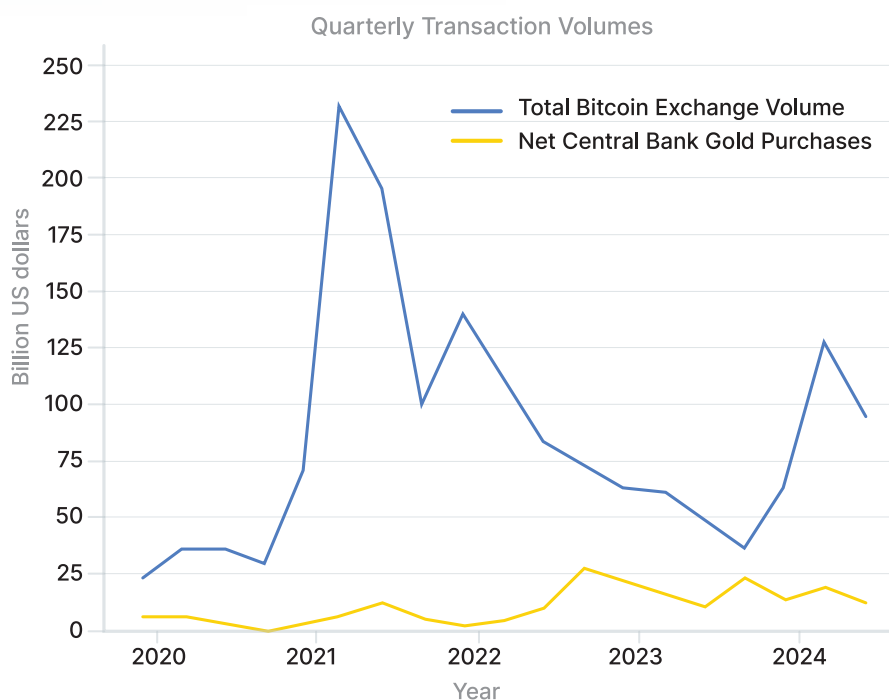
Thus, for central banks, Bitcoin offers the promise of some sanctions resistance, particularly if the central bank can readily access cryptocurrency trading infrastructure to facilitate the exchange of Bitcoin for foreign currency.

7

Highly Liquid Asset

Bitcoin does not possess the deep liquidity of the US Treasury market, but its liquidity is sufficient to accommodate transactions in the billions of dollars, comparable to gold. Indeed, Bitcoin may offer superior liquidity compared to many fiat assets that are potentially subject to capital controls. Academic researchers have shown that Bitcoin facilitates the evasion of capital controls in emerging economies.²⁸ For example, in Argentina, the tightening of capital controls was associated with increased usage of cryptocurrencies.

Figure 4: Bitcoin Exchange Volumes Are Sufficient to Accommodate Central Bank Purchases



Source: World Gold Council,²⁹ bitcoinity.org³⁰

²⁸ von Luckner, C. G., Carmen M. Reinhart, and Kenneth Rogoff. (2023). 'Decrypting new age international capital flows.' *Journal of Monetary Economics*, 138, 104-122.

²⁹ Gold Demand Trends Data Tables. (2024). World Gold Council. <https://www.gold.org/goldhub/research/gold-demand-trends/gold-demand-trends-q2-2024>

³⁰ Monthly Bitcoin trading volume in USD. <https://data.bitcoinity.org/markets/volume/>

8

Serves as a Geopolitical Diversifier

Recently, the International Monetary Fund has highlighted the potential effects of rising geopolitical tensions on international finance.³¹ To the extent that these tensions lead to fragmentation of the international financial system, the disruption of international capital flows poses risks to financial stability, remittances, and trade.

There is mixed evidence whether geopolitical fragmentation in the international financial system is actually occurring. Looking at international capital flows in 2022, a Federal Reserve Board economist found no evidence that emerging market economies—including China, the Middle East, and India—have recently reduced their purchases of U.S. securities.³² On the other hand, academic research shows that countries that acquired more of their military equipment from China and Russia also grew their gold reserves at a faster rate from 2016 to 2021.³³ In 2022, central banks bought a record quantity of gold, with significant purchases by China, Turkey, India, and Middle Eastern oil exporters.³⁴ Turkey's appetite for gold may be, in part, motivated by Turkey's recent exposure to US sanctions. In 2019³⁵ and in 2020³⁶ the US imposed sanctions on Turkey for Turkey's military activities in Syria and Turkey's acquisition of an advanced Russian air defense system.

Regardless of the extent of geopolitical fragmentation in the international financial system, academic researchers have found evidence that Bitcoin hedges geopolitical risks. In particular, geopolitical risk predicts both the returns and the volatility of Bitcoin.³⁷ Looking at large price swings in the cryptocurrency markets, researchers found that only Bitcoin jumps were dependent upon jumps in a geopolitical risk index, providing further evidence of Bitcoin's unique position among crypto assets.³⁸

31 International Monetary Fund. (April 2023). 'Global Financial Stability Report.'

32 Weiss, C. (2023). 'Financial Flows to the United States in 2022: Was There Fragmentation?' *FEDS Notes*.

33 Ferranti, M. (2024). 'Hedging Sanctions Risk: Cryptocurrency in Central Bank Reserves.' *SSRN*. Working Paper.

34 World Gold Council. (2023). 'Gold Demand Trends Full Year 2022: Central Banks.' <https://www.gold.org/goldhub/research/gold-demand-trends/gold-demand-trends-full-year-2022/central-banks>

35 Semones, E. (2019). 'Trump authorizes sanctions on Turkey over actions in Syria.' *POLITICO*.

36 Macias, A. (2020). 'U.S. sanctions Turkey over purchase of Russian S-400 missile system.' *CNBC*.

37 Aysan, A. F., Ender Demir, Giray Gozgor, and Chi Keung Marco Lau. (2019). 'Effects of the geopolitical risks on Bitcoin returns and volatility.' *Research in International Business and Finance*, 47, 511-518.

38 Bouri, E., Rangan Gupta, and Xuan Vinh Vo. (2022). 'Jumps in Geopolitical Risk and the Cryptocurrency Market: The Singularity of Bitcoin.' *Defense and Peace Economics* 33(2), 150-161.

9

Conclusion

Neither Bitcoin nor gold are necessarily suitable for every central bank, and it is beyond the scope of this paper to make specific investment recommendations. There are several factors that influence the currency composition of central bank reserves, beyond those discussed here. For example, central banks typically align their reserve currency composition with that of their currency peg (if any) as well as the currency composition of their imports and external debts.³⁹

Bitcoin possesses some unique investment characteristics that could help central banks diversify against several risks, including those related to inflation, geopolitical tensions, capital controls, sovereign default, bank failures, and financial sanctions. To the extent that gold is a reserve asset, so is Bitcoin.

³⁹ Gopinath, G. and Stein, J. (2018). 'Trade Invoicing, Bank Funding, and Central Bank Reserve Holdings.' *AEA Papers and Proceedings*, 108, 542-546.

www.btcpolicy.org

