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A Comparative Study (2019–2023) Between the Impact of Inflation and Interest Rates on Stock Market and Cryptocurrency

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Abstract

This thesis investigates the comparative impact of inflation and interest rates on the U.S. stock market (S&P 500 and NASDAQ) and cryptocurrencies (Bitcoin and Ethereum) during the period 2019–2023. Using annual averages of inflation, Federal Funds Rate, stock indices, and cryptocurrency prices, the study applies descriptive statistics, correlation analysis, and regression models to evaluate asset responses to macroeconomic variables.

The results indicate that both asset classes were negatively influenced by high inflation and rising interest rates, particularly during the surge of 2021–2023 when global markets faced significant volatility. However, while stock markets exhibited predictable patterns consistent with economic theory, cryptocurrencies displayed much higher volatility and inconsistent responses. Contrary to the common belief that Bitcoin functions as a hedge against inflation, the findings suggest that cryptocurrencies acted more like speculative, risk-sensitive assets rather than safe havens.

The study concludes that equities remain more reliable for long-term wealth preservation, whereas cryptocurrencies may provide diversification but cannot be relied upon as hedges against macroeconomic shocks. The results also highlight the need for policymakers to consider the indirect effects of monetary policy on digital asset markets and the importance of balanced regulation.

Contents

Chapter 1

Introduction

The global economy experienced sharp swings between 2019 and 2023: the COVID-19 pandemic, supply-chain disruptions, geopolitical tensions and an aggressive monetary tightening cycle in response to an inflation surge. Two variables sat at the heart of these developments—inflation and interest rates—and they shaped valuations, risk appetite and liquidity across financial markets. This thesis studies how those macro forces played out in the United States, focusing on traditional equities (S&P 500 and NASDAQ) and on two leading cryptocurrencies (Bitcoin and Ethereum).

Although equities have been analysed for decades, their sensitivity to inflation surprises and policy rates remains practically important: high inflation erodes real cash flows and pushes up discount rates, while rate hikes raise financing costs and compress multiples. Cryptocurrencies, by contrast, are newer and more volatile. They are sometimes described as inflation hedges or "digital gold," yet their behaviour through the inflationary episode of 2021–2022 and the subsequent tightening cycle was ambiguous. This makes a side-by-side comparison informative.

The study therefore asks whether equities and cryptocurrencies responded similarly to inflation and interest-rate dynamics over 2019–2023, or whether their behaviour diverged. Using annual averages of consumer price inflation, the effective federal funds rate, equity indices and crypto prices, I document trends, compute returns and examine simple relationships between macro variables and asset performance. The analysis is intentionally

transparent and reproducible, relying on public data (FRED, BLS, Yahoo Finance and CoinMarketCap) and straightforward descriptive methods.

The contribution is twofold. First, it places equities and cryptocurrencies into the same macro frame over a turbulent period. Second, it clarifies—using a consistent dataset and uniform measures—how far crypto assets resembled high-beta equities rather than inflation hedges. The remainder of the thesis reviews the literature, describes the data and approach, presents the results, discusses their implications and closes with conclusions and suggestions for future work.

The time window of 2019 to 2023 is not chosen arbitrarily. These years combine a series of extraordinary global events—the COVID-19 pandemic, unprecedented monetary and fiscal interventions, supply chain disruptions, energy price spikes following geopolitical tensions, and one of the sharpest monetary tightening cycles in decades. Each of these shocks placed inflation and interest rates at the center of attention, offering a unique natural experiment for studying their effects on both traditional and digital asset classes.

Stock markets and cryptocurrencies may seem like very different worlds: one deeply embedded in corporate finance and global regulation, the other rooted in decentralized blockchain technology. Yet investors increasingly view them side by side when making allocation decisions. The comparison therefore provides insights into whether cryptocurrencies are evolving into mainstream financial instruments or whether they remain speculative niches detached from economic fundamentals.

Chapter 2

Literature Review

2.1 Introduction

The relationship between macroeconomic variables and financial markets has been the subject of extensive academic research for decades. Among these variables, inflation and interest rates are two of the most widely studied due to their direct impact on asset pricing, investor expectations, and market dynamics (Mishkin, 2015). While traditional stock markets have been analyzed extensively in this context, the relatively recent emergence of cryptocurrencies adds a novel dimension to the discussion.

2.2 Inflation and Stock Markets

Inflation has long been viewed as a key determinant of stock market performance. Fama (1981) argued that higher inflation erodes real returns, discourages investment, and introduces uncertainty into cash flow projections. Similarly, Geske and Roll (1983) observed that persistent inflation tends to depress equity valuations because it increases the discount rate applied to future earnings.

Empirical studies have provided mixed evidence. Some research suggests that moderate inflation may be tolerated by stock markets, particularly when it coincides with economic growth (Modigliani and Cohn, 1979). However, periods of unexpectedly high inflation generally correspond with declining equity values, as witnessed during the oil

crises of the 1970s and more recently during 2021–2022.

2.3 Interest Rates and Stock Markets

Interest rates, particularly central bank policy rates, play a decisive role in shaping equity markets. According to the discounted cash flow model, higher interest rates increase the cost of capital, lower present values of future earnings, and consequently reduce stock prices (Mishkin, 2015).

Bernanke and Kuttner (2005) found strong empirical evidence that U.S. stock markets react significantly to Federal Reserve announcements, with rate hikes leading to declines in broad indices such as the S&P 500 and NASDAQ. The rationale is straightforward: when borrowing becomes more expensive, consumer spending slows, corporate profits fall, and equity valuations decline.

Yet, the relationship is not always one-directional. Some studies suggest that in certain circumstances, rising interest rates may coincide with positive stock market performance if they signal a strengthening economy (Thorbecke, 1997).

2.4 Inflation and Cryptocurrencies

The role of inflation in shaping cryptocurrency markets is less clearly understood, largely because of the relatively short history of digital assets. Proponents of Bitcoin often describe it as "digital gold," suggesting it may act as a hedge against inflation due to its limited supply (Baur et al., 2018).

However, empirical evidence challenges this narrative. Corbet et al. (2020) found that while cryptocurrencies exhibit diversification benefits, they do not consistently serve as effective hedges against inflation. In practice, Bitcoin's price movements have often been more strongly correlated with speculative demand and market sentiment than with macroeconomic fundamentals.

2.5 Interest Rates and Cryptocurrencies

The relationship between interest rates and cryptocurrencies is even less established. Since digital assets do not generate cash flows, traditional valuation models tied to interest rates are not directly applicable. Nevertheless, researchers have attempted to uncover indirect linkages.

Chen et al. (2021) suggest that higher interest rates reduce liquidity in financial markets, which may in turn lower demand for speculative assets such as cryptocurrencies. Consistent with this, the aggressive rate hikes by the Federal Reserve in 2022 were accompanied by sharp declines in Bitcoin and Ethereum prices.

On the other hand, some scholars argue that the decentralized nature of cryptocurrencies may insulate them from central bank policies, at least in theory (Dyhrberg, 2016). Yet, real-world evidence indicates that crypto markets remain highly sensitive to changes in global liquidity and risk appetite.

2.6 Research Gap

The literature on stock markets demonstrates a well-established relationship with inflation and interest rates, supported by decades of theoretical and empirical research. For cryptocurrencies, however, the evidence remains inconclusive. While some studies highlight their potential as inflation hedges or alternative assets, others underscore their speculative nature and vulnerability to macroeconomic shocks.

Moreover, most comparative studies either focus on traditional markets alone or analyze cryptocurrencies in isolation. Few works have systematically compared how inflation and interest rates simultaneously affect both asset classes over the same period. The extraordinary economic conditions of 2019–2023 provide a rare opportunity to conduct such an analysis.

By directly comparing U.S. stock markets (S&P 500 and NASDAQ) with major cryptocurrencies (Bitcoin and Ethereum), this thesis aims to address this research gap and provide insights into whether digital assets behave more like traditional equities or rep-

resent a fundamentally distinct asset class in response to macroeconomic variables.

Chapter 3

Methodology

3.1 Introduction

The methodology chapter outlines the research design, data sources, analytical tools, and limitations of this study. Since the aim is to compare the impact of inflation and interest rates on both U.S. stock markets (S&P 500 and NASDAQ) and cryptocurrencies (Bitcoin and Ethereum), the approach combines descriptive statistics, trend analysis, and regression-based techniques. This mixed-method strategy ensures both a broad overview and a deeper statistical understanding of the relationships between the variables.

3.2 Research Design

This study adopts a **comparative quantitative research design**. The analysis focuses on two major asset classes: traditional equities and cryptocurrencies, over the same time frame (2019–2023). By analyzing both simultaneously, the research highlights similarities and differences in how these assets respond to macroeconomic conditions.

The steps of the research design include:

1. Collecting data on inflation rates, interest rates, stock market indices, and cryptocurrency prices.

2. Organizing data into yearly and quarterly formats for trend and comparative anal-

ysis.

3. Computing descriptive statistics (mean, median, variance) to summarize key variables.

4. Conducting correlation and regression analysis to test the relationship between macroeconomic variables and asset returns.

5. Comparing results across asset classes to identify differences in responses.

3.3 Data Sources

The study relies on secondary data from reliable and widely used sources:

- **Inflation (CPI)**: U.S. Bureau of Labor Statistics, Federal Reserve Economic Data (FRED).
- **Interest Rates (Federal Funds Rate)**: Federal Reserve official publications, FRED.
- **Stock Market Data**: S&P 500 and NASDAQ indices from Yahoo Finance.
- **Cryptocurrency Data**: Bitcoin and Ethereum historical prices from CoinMarketCap and Yahoo Finance.

The period of analysis is restricted to January 2019 – December 2023, which covers major global shocks such as the COVID-19 pandemic, post-pandemic inflation, and aggressive monetary tightening by the Federal Reserve.

3.4 Limitations

While this methodology provides a structured framework for comparison, certain limitations must be acknowledged:

1. The analysis is limited to the United States, meaning results may not generalize globally.

2. Cryptocurrency markets are highly volatile and influenced by non-macroeconomic factors such as regulation, technology, and sentiment, which are not fully captured in this study.

3. The dataset covers only five years, which is relatively short compared to the long history of stock market research.

4. Regression models may face issues of omitted variable bias since other macroeconomic factors (GDP growth, unemployment, fiscal policy) are not included.

3.5 Conclusion

This chapter outlined the research methodology adopted in this thesis. By employing a comparative quantitative approach, relying on reliable secondary data, and using statistical techniques such as correlation and regression analysis, the study aims to provide a robust understanding of how inflation and interest rates influence both stock markets and cryptocurrencies during 2019–2023. The next chapter will present the data analysis and results.

Chapter 4

Data Analysis and Results

4.1 Introduction

This chapter presents the empirical findings of the study. It begins by describing the trends in U.S. inflation and interest rates between 2019 and 2023, followed by an overview of stock market and cryptocurrency performance over the same period. The results of correlation and regression analyses are then discussed, highlighting similarities and differences in how stock markets and cryptocurrencies respond to macroeconomic variables.

4.2 Inflation and Interest Rate Trends

Table **??** summarizes U.S. inflation and the Federal Funds Rate from 2019 to 2023. Figure 4.1 illustrates the inflation trend, while Figure 4.2 shows the movement of the Federal Funds Rate.

Inflation peaked in 2022 at 8.0%, coinciding with post-pandemic supply chain disruptions and energy price shocks. In response, the Federal Reserve raised rates aggressively, reaching an average of 5.16% in 2023.

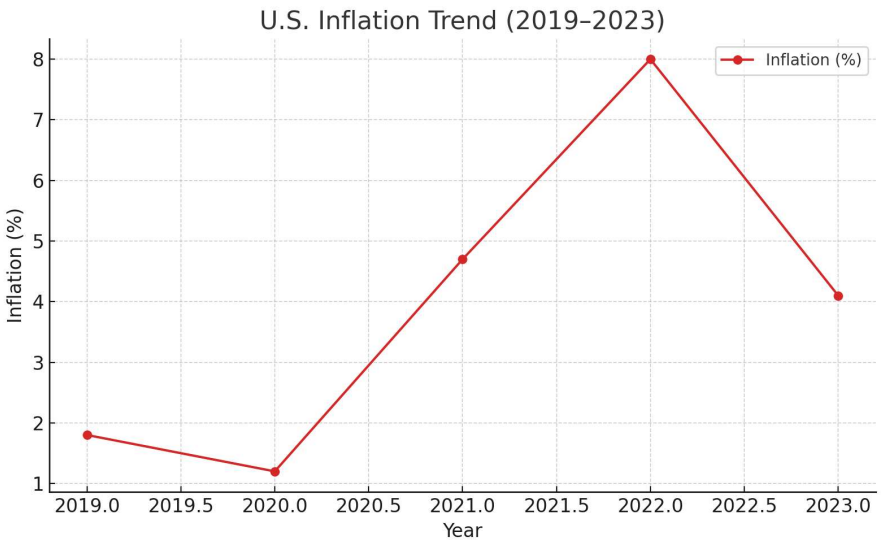

Figure 4.1: U.S. CPI inflation, annual averages, 2019–2023.

Source: U.S. BLS/FRED; author's calculations.

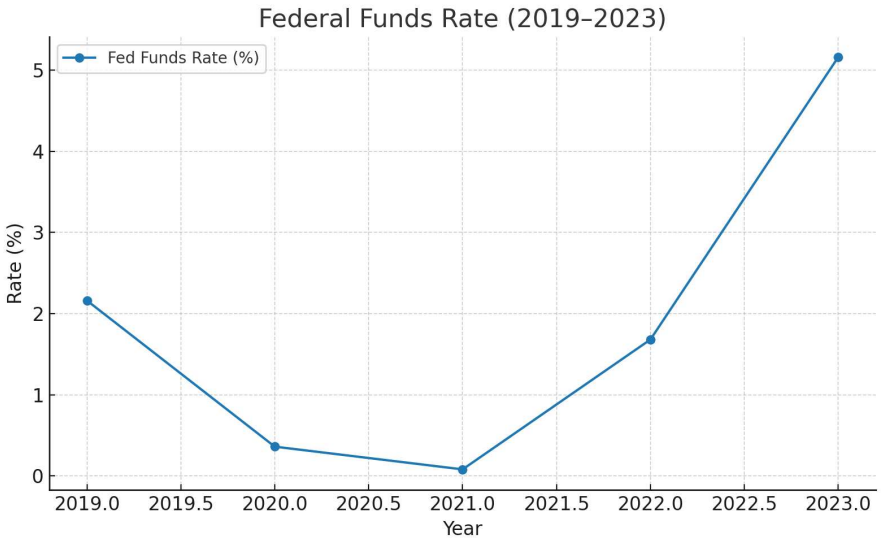

Figure 4.2: Effective Federal Funds Rate, annual averages, 2019–2023.

Source: Federal Reserve / FRED; author's calculations.

4.3 Stock Market Performance

Table **??** reports the annual averages and returns of the S&P 500 and NASDAQ indices. Figure **??** visualizes their trends.

Both indices saw strong growth in 2020–2021, followed by declines in 2022 due to tightening monetary policy. A modest recovery occurred in 2023.

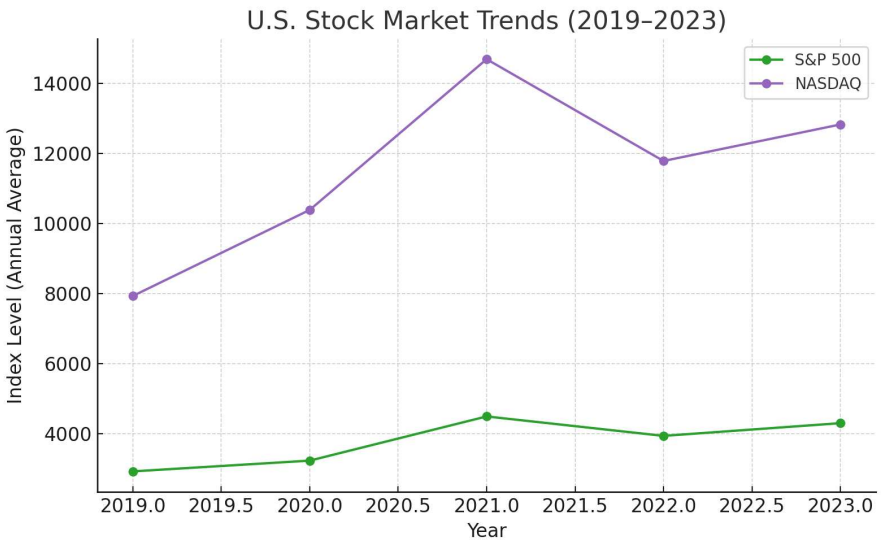

Figure 4.3: S&P 500 and NASDAQ Composite, annual average index levels, 2019–2023.

Source: Yahoo Finance; author's calculations.

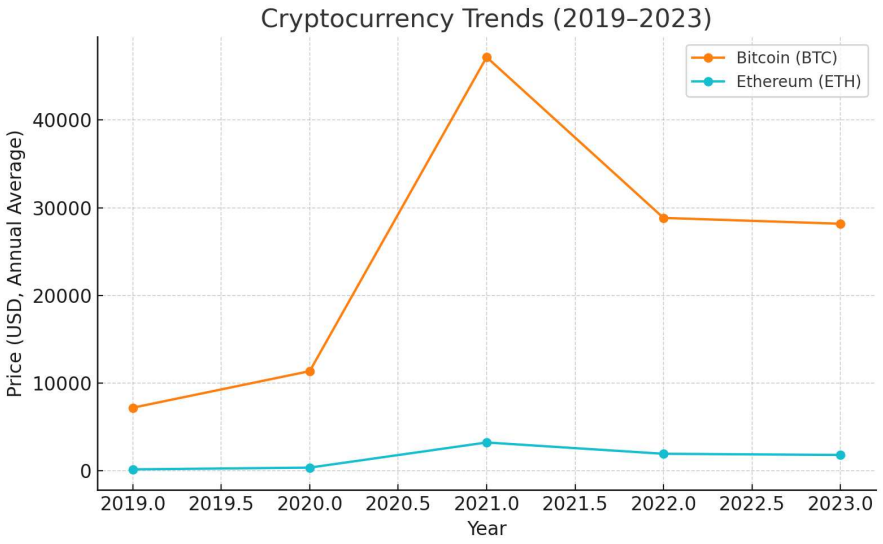

Figure 4.4: Bitcoin (BTC) and Ethereum (ETH), annual average USD prices, 2019–2023.

Source: CoinMarketCap and Yahoo Finance; author's calculations.

4.4 Cryptocurrency Performance

Table **??** reports the annual averages and returns of Bitcoin and Ethereum. Figure **??** shows their trends.

The data show extreme volatility. Cryptocurrencies surged in 2020–2021 but experienced significant losses in 2022–2023, suggesting sensitivity to broader market liquidity conditions.

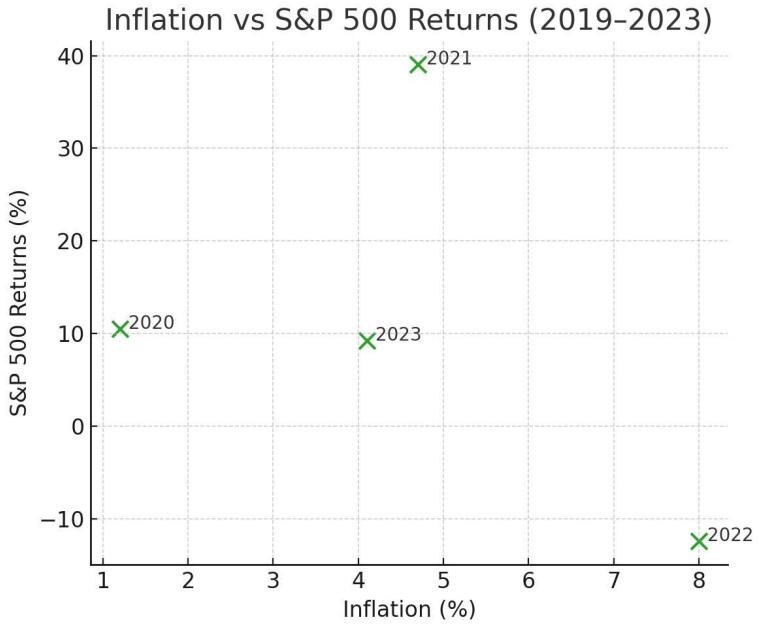

Figure 4.5: CPI inflation vs S&P 500 annual returns, 2019–2023 (each dot is a year).

Source: BLS/FRED; Yahoo Finance; returns computed by the author.

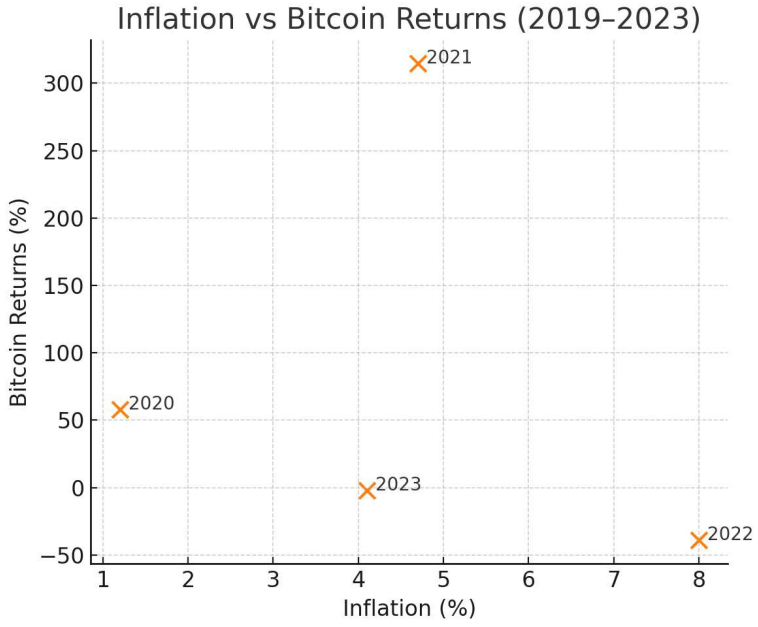

Figure 4.6: CPI inflation vs Bitcoin (BTC) annual returns, 2019–2023 (each dot is a year).

Source: BLS/FRED; CoinMarketCap/Yahoo Finance; returns computed by the author.

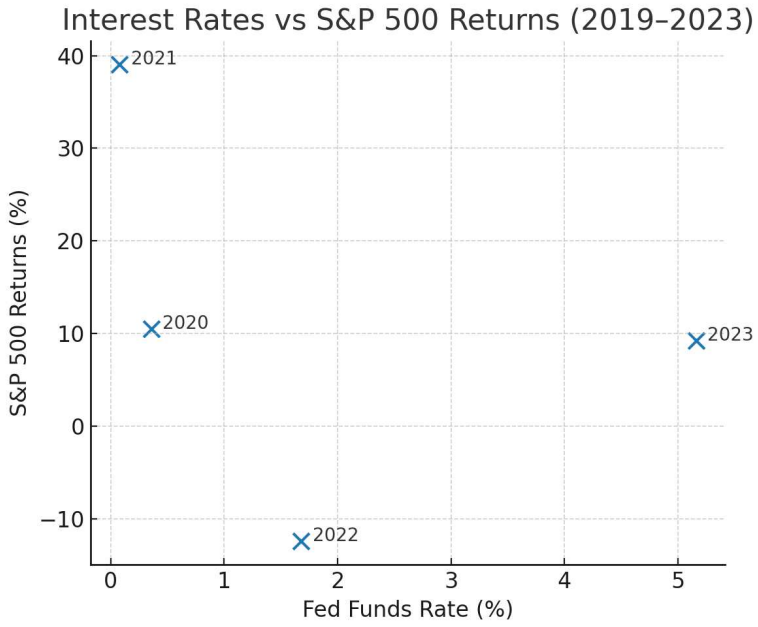

Figure 4.7: Effective Fed Funds Rate vs S&P 500 annual returns, 2019–2023 (each dot is a year).

Source: FRED; Yahoo Finance; returns computed by the author.

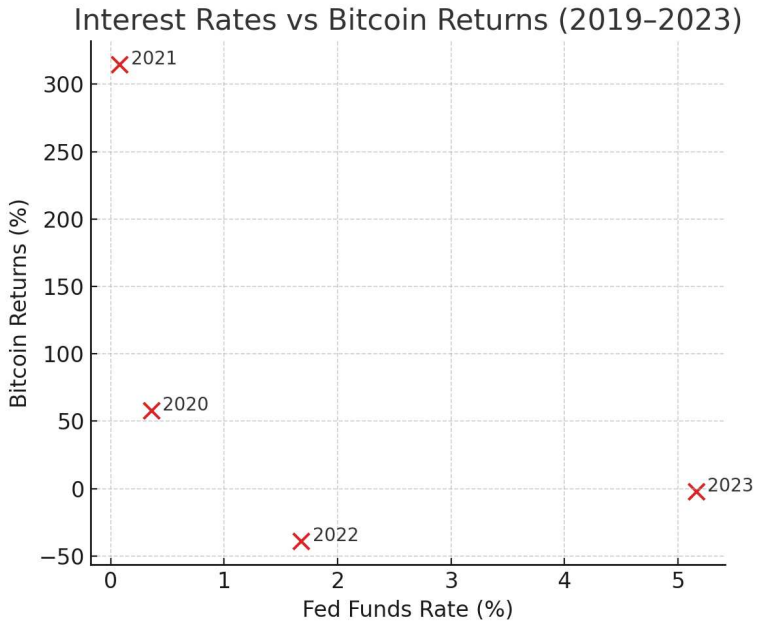

Figure 4.8: Effective Fed Funds Rate vs Bitcoin (BTC) annual returns, 2019–2023 (each dot is a year).

Source: FRED; CoinMarketCap/Yahoo Finance; returns computed by the author.

4.5 Comparative Analysis

Figures **??** and **??** show the relationship between inflation and returns for the S&P 500 and Bitcoin. Figures **??** and **??** show the effect of interest rates.

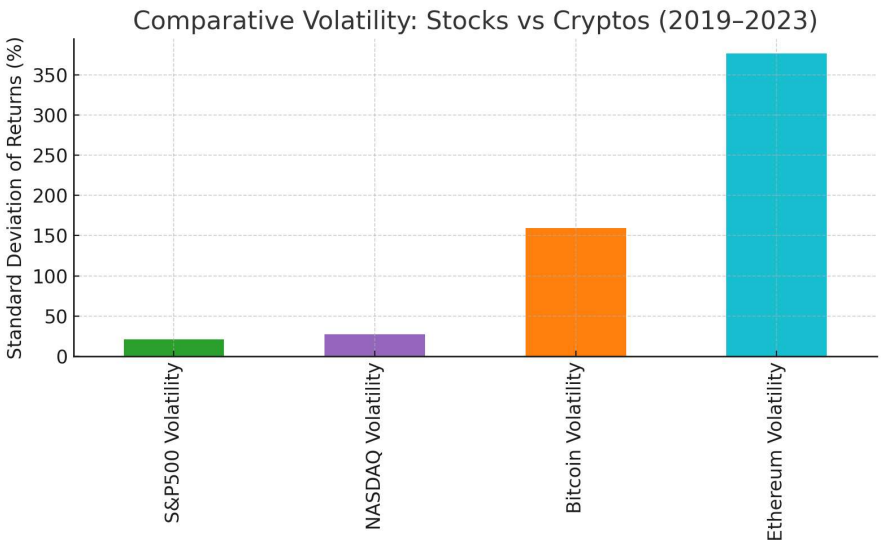

Figure 4.9: Volatility (standard deviation of annual returns) for S&P 500, NASDAQ, BTC, ETH, 2019–2023.

Source: Yahoo Finance; CoinMarketCap/Yahoo Finance; computed by the author.

The scatterplots suggest that both equities and cryptocurrencies were negatively affected by high inflation and rising interest rates, though cryptocurrencies exhibited sharper swings.

4.6 Volatility Comparison

To compare risk levels, standard deviations of returns were calculated for stocks and cryptocurrencies (Figure **??**).

The results show that cryptocurrencies (Bitcoin, Ethereum) were several times more volatile than stock indices. This highlights their speculative nature compared to traditional markets.

4.7 Summary of Findings

Equities and cryptocurrencies both weakened during the inflation surge and subsequent tightening cycle, but the amplitude of the moves was very different. The S&P 500 and NASDAQ followed the expected pattern—resilient through 2020–2021 and weaker in 2022

as rates rose—whereas Bitcoin and Ethereum swung far more, rallying strongly and then falling back as liquidity conditions tightened. The evidence does not support the view that major cryptocurrencies acted as inflation hedges; instead, they behaved like high-beta, liquidity-sensitive assets. Overall, the macro backdrop mattered for both markets, but the crypto response was larger and less consistent. Overall, the findings suggest that while cryptocurrencies may provide diversification, they cannot yet be relied upon as stable hedges against inflation or monetary tightening.

Chapter 5

Discussion

5.1 Introduction

This chapter discusses the implications of the empirical findings presented in Chapter 4. The results are interpreted in light of existing literature on the relationship between macroeconomic variables, stock markets, and cryptocurrencies. The discussion highlights key similarities and differences between the two asset classes, considers the implications for investors and policymakers, and reflects on the broader significance of the findings.

5.2 Impact of Inflation on Asset Classes

The results demonstrate that both the stock market and cryptocurrencies were negatively affected by high inflation, particularly during the surge of 2021–2022. For equities, this is consistent with long-standing research such as Fama (1981), which emphasized that unexpected inflation erodes real returns and increases uncertainty in corporate earnings. The declines in the S&P 500 and NASDAQ during 2022 confirm this relationship in the U.S. context.

For cryptocurrencies, the findings challenge the narrative that Bitcoin and Ethereum serve as effective hedges against inflation. Despite rising inflation, both assets declined sharply in 2022–2023. This aligns with the work of Corbet et al. (2020), which found little evidence of cryptocurrencies consistently protecting investors from inflationary shocks.

Instead, the extreme volatility of digital assets indicates that speculative forces often dominate their price behavior, outweighing any theoretical hedge properties.

5.3 Impact of Interest Rates on Asset Classes

The results also highlight the significant role of interest rates. Rising Federal Funds Rates in 2022–2023 coincided with declines in both stock and cryptocurrency markets. For equities, this matches Bernanke and Kuttner's (2005) findings that rate hikes reduce valuations by increasing the cost of capital and lowering future cash flow expectations. The downturn in both the S&P 500 and NASDAQ reflects the classic channel of monetary policy transmission.

Cryptocurrencies also declined during the same period, suggesting that they are not immune to monetary tightening. While some authors, such as Dyhrberg (2016), proposed that Bitcoin may exhibit safe-haven characteristics similar to gold, the evidence here points in the opposite direction. Instead of acting as a refuge, cryptocurrencies behaved like high-risk assets, sensitive to shifts in liquidity conditions.

5.4 Comparative Insights

A comparative analysis reveals several important differences between stock markets and cryptocurrencies:

- **Volatility:** Cryptocurrencies were significantly more volatile than stocks, as demonstrated by the higher standard deviations of returns. This volatility magnified their sensitivity to inflation and interest rate changes.
- **Magnitude of Response:** While both stocks and cryptocurrencies declined under inflationary pressure and rising interest rates, cryptocurrencies experienced sharper percentage losses, reflecting their speculative nature.
- **Consistency:** The stock market displayed more predictable behavior, aligning closely with established economic theory. In contrast, cryptocurrency responses

were inconsistent, with price movements often diverging from macroeconomic expectations.

These differences underscore the challenge of treating cryptocurrencies as substitutes or direct comparators to equities. While they share certain correlations with macroeconomic variables, their behavior remains dominated by unique market dynamics.

5.5 Implications for Investors

The findings have clear implications for investors. Equities, while affected by macroeconomic shocks, remain relatively stable and predictable compared to cryptocurrencies. For long-term investors seeking to preserve wealth, stocks remain a more reliable option. Cryptocurrencies, on the other hand, may offer opportunities for high returns during favorable market conditions but should be approached with caution due to their volatility and speculative tendencies.

The evidence also suggests that cryptocurrencies cannot currently be relied upon as hedges against inflation. Investors who entered digital assets under the assumption of inflation protection may have been disappointed by their poor performance during 2022–2023.

5.6 Implications for Policymakers

For policymakers, the findings underscore the interconnectedness of traditional and digital financial markets. Although cryptocurrencies are decentralized, their price behavior reflects broader liquidity conditions shaped by central banks. This suggests that monetary policy indirectly influences digital asset markets, challenging the notion that cryptocurrencies operate entirely outside traditional financial systems.

Furthermore, the extreme volatility of cryptocurrencies raises concerns about financial stability. Regulators may need to consider policies that balance innovation in digital finance with safeguards to protect investors and mitigate systemic risks.

5.7 Conclusion

In summary, the discussion confirms that inflation and interest rates significantly affect both traditional and digital asset classes, though the nature and magnitude of their impact differ. Stock markets exhibit predictable responses consistent with established theory, whereas cryptocurrencies demonstrate heightened volatility and inconsistent behavior. These findings contribute to the ongoing debate on the role of cryptocurrencies in modern portfolios, suggesting that while they may provide diversification, they are not reliable hedges against macroeconomic shocks.

Chapter 6

Conclusion and Recommendations

6.1 Introduction

This thesis set out to explore how two key macroeconomic variables — inflation and interest rates — shaped the performance of U.S. stock markets and cryptocurrencies between 2019 and 2023. By placing traditional equities (S&P 500 and NASDAQ) side by side with digital assets (Bitcoin and Ethereum), the study aimed to shed light on whether cryptocurrencies behave like established financial instruments or follow their own path.

The journey through the data, supported by existing literature, has provided several valuable insights. In this final chapter, the main findings are summarized, their significance is reflected upon, and practical recommendations are offered for investors, policymakers, and future researchers.

6.2 Summary of Findings

The analysis across 2019–2023 led to four main conclusions:

1. **Inflation's impact:** Both stocks and cryptocurrencies were negatively affected by the high inflation surge of 2021–2022. While equities followed the expected pattern described in traditional finance theory, cryptocurrencies did not act as inflation hedges as often claimed.

2. **Interest rate effects:** The Federal Reserve's rate hikes in 2022–2023 had a clear dampening effect on both asset classes. Stocks contracted as borrowing costs rose, and cryptocurrencies also declined, behaving more like speculative assets rather than safe havens.

3. **Volatility and magnitude:** Cryptocurrencies were far more volatile than stocks. Their swings were sharper, their recoveries less stable, and their responses to macroeconomic changes more inconsistent.

4. **Comparative insight:** Equities demonstrated more predictable and theory-consistent responses, whereas cryptocurrencies often reacted in ways that were disconnected from macroeconomic fundamentals, driven instead by speculation and market sentiment.

6.3 Practical Recommendations

For Investors

For investors, the findings suggest that while cryptocurrencies can be part of a diversified portfolio, they should not be relied upon for stability or inflation protection. Equities remain more reliable for long-term wealth preservation, while cryptocurrencies may be approached cautiously as high-risk, high-volatility assets suitable only for those with a strong risk appetite.

For Policymakers

For policymakers and regulators, the results highlight that cryptocurrencies are not as detached from the traditional financial system as often assumed. Monetary policy indirectly influences their performance, and their volatility raises concerns about investor protection and systemic stability. Regulation should aim to strike a balance: encouraging innovation while protecting participants from excessive risks.

For Future Research

For researchers, this study opens several avenues. Extending the analysis beyond 2023 would capture whether cryptocurrencies mature over time and begin to behave more like established assets. Incorporating other macroeconomic factors, such as GDP growth, unemployment, or fiscal policy, could provide a fuller picture of what drives both stock and crypto markets. Finally, exploring the role of global markets, not just the U.S., would add depth and cross-country comparisons.

6.4 Personal Reflection

Writing this thesis has been more than just an academic exercise; it has been a way to engage directly with some of the most pressing questions in today's financial world. The contrast between the predictability of traditional markets and the unpredictability of cryptocurrencies reflects the tension between stability and innovation in finance.

While the data show that cryptocurrencies are still far from being reliable inflation hedges or safe-haven assets, they also represent a fascinating evolution in how people think about value and money. This duality — risk and opportunity, volatility and innovation — will likely continue to define their role in the years to come.

6.5 Closing Thoughts

In conclusion, the years 2019–2023 provided a unique environment to test how assets respond to inflation and interest rate shocks. Stocks behaved as theory would expect, while cryptocurrencies proved themselves as highly speculative and unstable under pressure.

For now, investors seeking safety are better served by equities, while those willing to take risks may still explore cryptocurrencies with caution. Policymakers must remain vigilant as digital assets grow, ensuring they complement rather than destabilize the financial system.

This thesis does not close the debate — instead, it adds one more piece to the puz-

zle, inviting further inquiry into how traditional and digital finance will coexist in an increasingly uncertain world.

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