Market Reaction Test on Banks & Brokers Based on Bitcoin Price History. A Look at National Commercial Banks and Security Broker, Exchanges, and Service Stocks following the most volatile swings in Bitcoin’s Price.

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Market Reaction Test on Banks & Brokers Based on Bitcoin Price History. A Look at National Commercial Banks and Security Broker, Exchanges, and Service Stocks following the most volatile swings in Bitcoin’s Price.

Submitted to
Professor Finley

By
Payton Earl

For
Senior Thesis
Fall 2023
December 4, 2023
Abstract

This paper examines if there is an inverse correlation between Bitcoin’s most volatile price swings and national commercial banks and security brokers, exchanges and service companies performance. Company performance in the dataset is measured by Cumulative Abnormal Returns during 2021 within a two-day period where Bitcoin has had the most significant uptick and downtick events. Using a market-adjusted model for my regression, it is concluded that Bitcoin’s largest uptick event did indeed have an inversely negative effect on traditional banks and trading securities companies, as the Cumulative Abnormal Returns were negative for my 107 observations and the event was statistically significant. Additionally it concluded that Bitcoin’s largest downtick event had little to zero correlation and impact on the Cumulative Abnormal Returns for my observations and was not statistically significant. However this led me to speculate further that in times of economic turmoil specifically concerning the largest dip for Bitcoin in 2021 that banks react quickly to negative price movements in Bitcoin which allows them to maintain a stable foundation. Finally the paper concludes that for future event analysis of its own significance it is important to capture all elements desired of bank information, as leaving out certain information can lead to omitted variable bias.
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Abstract
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1. Introduction

Bitcoin, a decentralized digital currency introduced in 2009, has steadily gained prominence in the global economy. This paper aims to explore the evolving impact of Bitcoin on the financial sector, particularly on the national commercial banks and security brokers, exchanges and service companies. Also, it examines if there is an inverse correlation between Bitcoin’s most volatile price swings and national commercial banks and security brokers, exchanges and service company performance through Bitcoin’s largest uptick and downtick event in 2021 where it was the most volatile. Using bank information, Bitcoin’s pricing model, financial ratios, and Wharton’s (WRDS) Event Study market-adjusted risk model, I attempt to determine if these events are statistically significant and are indeed impactful on banks/trading companies Cumulative Abnormal Returns. The public consumer banks and broker companies I used fall under a specific category based on their SIC Code. The SIC Code, also known as the Standard Industrial Classification, identifies companies based on a 4-digit code used as a method of standardizing industry classification for statistical purposes across agencies. I have chosen two SIC codes to be used for this market test which are traditional commercial banks under code 6020 and Security/Commodity Brokers under code 6200. The data is split into two events, the first dataset controls for the largest uptick event in Bitcoin’s pricing model and compares it to an uptick event in 2020. It serves as a representation of Bitcoin’s normal price shifts prior to 2021 since Bitcoin is a fairly new currency that is not fully trusted or understood for investors in our economy, and has not gotten as much traction or investment in previous years to ever have a real impactful significance on multi billion dollar traditional banks. The second dataset controls for the largest downtick event in Bitcoin’s pricing model and compares itself to an downtick event at the end of 2021 as a representation of the ending of the large downtick trend during 2021 as
many other events were impacting banks like inflation, Silicon Valley Bank’s imminent crash, but these events are excluded from my analysis as these events impacted the entire economy as a result. For this paper I am focusing on these two specific events in a small window. Bitcoin’s decentralized nature and peer-to-peer transaction system challenge the conventional role of national banks in facilitating financial transactions. It presents an alternative mode of transferring value that bypasses traditional banking infrastructure. Some banks have begun exploring blockchain technology, the underlying framework of Bitcoin, for enhancing their operations, including payment processing and record-keeping. However, widespread integration of cryptocurrencies into banking services remains limited due to regulatory uncertainties and risk factors. The regulatory landscape surrounding Bitcoin transactions poses challenges for banks. Uncertainties regarding compliance, anti money laundering (AML), and customer protection policies hinder their full-scale participation in the cryptocurrency ecosystem. The emergence of cryptocurrency has transformed the landscape of security and commodity brokerages. These platforms offer trading opportunities for cryptocurrencies, creating a parallel market alongside traditional assets. Bitcoin’s rise has unlocked new investment avenues, attracting both retail and institutional investors. It has also introduced volatility and complexities previously unseen in traditional markets, challenging the established norms of investment. Security and commodity brokers face evolving regulatory frameworks as they navigate the inclusion of cryptocurrencies in their portfolios. Compliance with regulations while offering cryptocurrency-related services remains a pressing challenge. National commercial banks have generally been cautious in embracing cryptocurrencies due to regulatory uncertainties, while security and commodity brokers have actively explored this new asset class to attract a broader investor base. As the adoption of cryptocurrencies continues, financial institutions will likely undergo further
transformations. Banks might intensify efforts to integrate blockchain technology securely, while brokers and exchanges may seek to innovate ways to bridge the gap between traditional and digital assets.

**Figure 1: Bitcoin (BTC)**

This graph is a representation of Bitcoin’s price movements from its inception in 2015 of being traded on the open market (Crypto.Com). Bitcoin’s growing impact on national commercial banks and security and commodity brokers, exchanges, and services companies signifies a profound shift in the financial landscape. While challenges persist, the integration of crypto currencies into the economy is inevitable. The future will witness a delicate balance between regulatory compliance and technological innovation as these institutions navigate the evolving cryptocurrency landscape. This structured paper provides an overview of Bitcoins influence on national commercial banks and financial entities, analyzing its disruptive potential and the
challenges and opportunities it presents to the traditional financial sector. It provides a foundation for further exploration into this evolving economic landscape. Upon analyzing the Cumulative Abnormal Returns (CARs) during Bitcoin’s largest uptick event, the empirical data revealed statistically significant results. These findings exhibited a noteworthy negative impact on national banks and brokerages within the dataset. This outcome effectively supported the initial hypothesis suggesting an inverse relationship between the performance of Bitcoin and that of national banks and brokerages. The implication is compelling, indicating that when Bitcoin experiences prosperity in the market, there’s a concurrent adverse effect on traditional financial institutions. This observation substantiates the notion that Bitcoin, as an emergent form of currency in the economy, may possess consequential implications for the performance of these financial entities in the future. Contrastingly, during Bitcoin’s largest downtick event, the data yielded statistically insignificant outcomes. The cumulative Abnormal Returns (CARs) of national banks, brokers, exchanges, and service companies were minimally affected. This finding suggests a rapid response mechanism within these financial institutions to market shifts. Their ability to promptly adapt and mitigate the impact on their Cumulative Abnormal Returns highlights an agility in reacting to adverse market conditions. This observation intimates that national banks, brokers, exchanges and service companies possess mechanisms to swiftly navigate market fluctuations, thereby reducing the shocks to their CARs during significant downturns in the cryptocurrency market.
2. History

In 2021, Bitcoin experienced significant price volatility, characterized by notable upticks and downticks that drew considerable attention within financial markets. “Bitcoins are mined by providing network services like verifying and collecting newly broadcast transactions which are added to a block. In order for a block to be accepted in the network, miners have to provide proof of authenticity by finding a specific number called a nonce. A hash function which maps the nonce back to an easily verifiable bit string ensures that the block is valid (cp. Antonopoulos 2014). As of August 31, 2020, there were 18.476 million Bitcoins in circulation. They amounted to a total market value of 216 billion USD” (Bauer, Dirk, Dimpfl 2021). One of the most volatile periods occurred in the first half of the year, marked by a substantial price surge followed by a subsequent sharp decline. Due to its high volatility, most empirical studies classify Bitcoin as an investment (Glaser et al. 2014; Baur et al. 2018; Bedi and Nashier 2020). Bitcoin’s remarkable ascent during this period was attributed to several factors. One major catalyst was increased institutional adoption and interest in cryptocurrencies. Institutional investors, Including hedge funds in major corporations, began allocating significant capital into Bitcoin. Tesla’s announcement of purchasing 1.5 billion worth of Bitcoin and accepting it as payment for their product contributed significantly to the surge. “Tesla said Monday that it bought $1.5 billion in bitcoin, a disclosure that follows Chief Executive Elon Musk’s promotion of cryptocurrency and other digital-currency alternatives on Twitter. The electric-vehicle company also said it expects to start accepting bitcoin as payment for its products soon. Bitcoin prices jumped more than 10% after the announcement, according to cryptocurrency research and news site CoinDesk”(Ostroff, Elliott 2021). The price surge led to a frenzy of retail investor interest, driving the price to an all-time high above $60,000. This surge in Bitcoin’s value had significant implications for the
broader economy and the financial sector, especially for national banks, brokers, exchanges, and service companies. The subsequent rapid decline in Bitcoins price was multifaceted. Regulatory concerns emerged as governments worldwide considered stricter regulations on cryptocurrencies, particularly regarding environmental concerns related to energy consumption in Bitcoin mining. In a thesis study at Seattle University they highlight that “when the price of Bitcoin hit all-time highs, the miners coming into the region were no longer interested in building five-megawatt mines; instead, they were building fifty-megawatt mines. This development represented enough power for about 22,000 homes, which is more energy than an Amazon Web Services’ data center uses” (Thomson, Jeff (2020). Additionally concerns about market manipulation and speculation fueled by Elon Musk’s tweets also contributed to the downturn. The sharp decline in Bitcoin’s price had repercussions across financial markets. It raised questions about the stability of cryptocurrencies as an investment asset and their potential impact on the traditional financial sector, including banks and financial institutions. The volatility in Bitcoin’s price in 2021 underscored the need for greater regulatory clarity and oversight in the cryptocurrency market. It highlighted the interconnectedness of cryptocurrencies with the broader economy, raising concerns about market stability and investor protection. For national banks, brokers, exchanges, and service companies, the extreme volatility in Bitcoin’s price posed challenges and opportunities. While some institutions may have benefited from increasing trading volumes and interest in cryptocurrencies, the rapid price swings also presented risks to their portfolios and market stability.
3. Current Literature

Research specifically linking Bitcoin to the Cumulative Abnormal Returns (CARs) of National Commercial Banks and security brokers, exchanges, and service companies might be limited due to the evolving nature of cryptocurrencies and the financial market. However, there are studies exploring the broader impact of cryptocurrencies on financial markets that can provide insights into this relationship. “The literature on Bitcoin is relatively new and has grown very fast in recent years. Trading aspects are considered by Cheah and Fry (2015) and Blau (2018) who investigate speculative behavior in Bitcoin trading. Whether Bitcoin serves to diversify the risk of an investment portfolio is analyzed by Brière et al. (2015), Guesmi et al. (2019), and Hussain Shahzad et al. (2020). There are numerous studies that look into the volatility of Bitcoin. Dwyer (2015), for example, analyzes monthly standard deviations of Bitcoin prices from Mt. Gox, BTC, and Bitstamp and concludes that these are 5–7 times higher than what is generally observed in stock markets”. Bouoiyour and Selmi (2016), Bouri et al. (2017), Katsiampa (2017), and Ardia et al. (2019) rely on GARCH models to estimate daily volatility. Such challenges, coupled with cryptocurrencies’ price volatility and their hybrid nature, which allows them to be used as a means of payment, investment, and access, have led to a surge of interest in studying cryptocurrencies among regulators ranging from financial crime enforcement agencies to banking, securities and commodity markets regulators. “However, these studies were mainly concerned with initial coin offerings (ICOs) enabled by the distributed ledger technologies (DLTs), blockchain and cryptocurrencies” (Nabilou, Hossein & Prum, André. (2019), and potential risks and rewards of the blockchain technology. Several studies by the European Central Bank (ECB), (Frankfurt an Main: European Central Bank, October 2012) the European Banking Authority (EBA), (London: European Banking Authority, 2014), the International
Monetary Fund (IMF), Dong He et al., "Virtual Currencies and Beyond: Initial Considerations."), the Bank for International Settlements (BIS), Morten Bech and Rodney Grarratt, "Central Bank Cryptocurrencies," (2017), (Gina C. Pieters, "The Potential Impact of Decentralized Virtual Currency on Monetary Policy," (2017), the US Federal Reserve and its regional banks on the risks and rewards of cryptocurrencies have been conducted”. In addition, there is literature on the economic, monetary and financial aspects of cryptocurrencies as they relate to central banking. (JP Koning, "Fedcoin," (2014). However, the legal aspects of cryptocurrencies from a central banking perspective are largely understudied. “All authors conclude that the volatility level is comparatively high, offering different explanations such as cyber attacks, information asymmetry, decentralization, or the absence of regulation” (Bauer, Dirk, Dimpfl. 2021). “Bitcoins are mined by providing network services like verifying and collecting newly broadcast transactions which are added to a block. In order for a block to be accepted in the network, miners have to provide proof of authenticity by finding a specific number called a nonce. A hash function which maps the nonce back to an easily verifiable bit string ensures that the block is valid” (cp. Antonopoulos 2014). As of August 31, 2020, there were 18.476 million Bitcoins in circulation. They amounted to a total market value of 216 billion USD. From my readings I found that there was little to no significant correlation between these two prior to 2021 and since Bitcoin had a slow start it makes sense it’s had little to no impact on traditional banks as many have been hesitant to accept Bitcoin use in today’s economy. These sources and research studies might not directly pinpoint the relationship between Bitcoin and CARs of financial institutions but can offer valuable insights and empirical evidence regarding the broader impact of cryptocurrencies on traditional Financial markets, which can indirectly influence the cumulative
abnormal returns of National Commercial Banks and security brokers, exchanges, and service companies.

4. Hypothesis

When it comes to my hypothesis I believe when either Bitcoin price jumps up there will be some negative drop and vice versa in the pricing of traditional bank and brokerage stocks. Bitcoin represents decentralized finance where more people are concerned about privacy and the ability to have more financial instrument access which goes away from the norm and typical access to services that traditional banks and brokers tend to provide to their customers or clients. The null hypothesis says there is no statistically significant difference between the samples. If our $T$ Value is lower than our critical value we then don’t reject the null hypothesis. If our $T$ Value is higher than our critical value we then reject the null hypothesis. My null hypothesis is two but inversely the same that if my mean for my uptick event was greater than or equal to 0 there was no significance and for my downtick event if my mean was less than or equal to 0 it had no significance. However I still applied a $T$-test for both of my events data points.

5. Data

The Data is measuring CAR as my main estimation: Which measures the effect of the event as I am measuring the impact of Bitcoin’s event of its largest uptick and downtick events.

Cumulative Abnormal Return is the Total Return- Expected Return of my selected banks

So having a low CAR means the event chosen had little to no impact and a CAR above 0 starts to
show that the actual return was more that the expected return and vice versa for losses. I used Wharton’s Event Study for my Regression or (WRDS), and my stipulations to run this regression were: Risk Model: Market-Adjusted Model. The Estimation window was 100 days, Minimum Number of Valid Observations to validate the data was 70 days. My Gap in days was 50. This represents the number of trading days to be established between the end of the estimation window and the beginning of the event window used to reduce the likelihood that risk model estimation is affected by the event-induced return variance. My event window was the date itself and the model measured the returns after the event occurrence this was determined by me and my reader professor finley as with trading days for the model itself to work has to be at the most 5 days and we wanted to target the impact of this event and the best way to not spread the data too wide we narrowed to to span only 2 days prior of the events occurrence. I sought to find if there was a statistical significance of the upticks and downticks then compared to the combined data. For gathering my data I made sure to use CapIq for arranging first the SIC Code for the two institutions I have been wanting to test for and my observations are chosen as such. I got a total of 107 observations and for both of the regressions I dropped 8 observations as they could not compute CAR as I detailed below, and for my uptick event another observation was dropped as that company didn’t meet that criteria in 2020 and had to be removed to avoid any skews or bias from the dataset. In relation to the two other variables measured within my regression being Cumulative Total Return and Buy Hold Abnormal Return. Cumulative total return (CTR) is a measure that reflects the aggregate performance of an investment over a specific period, considering both capital appreciation (or depreciation) and income generated by the investment during that time frame. In the context of traditional banks and security brokers, exchanges, and service companies, CTR would indicate the total return generated by holding the stocks or
Securities of these institutions over a particular period. It includes both changes in stock prices (Capital gains/losses) and any dividends or interest payments received. Buy-Hold Abnormal Return (BHAR) is a measure used in financial analysis to assess the abnormal performance of an investment relative to a benchmark or expected return over a specific holding period. For traditional Banks and security brokers, exchanges, and service companies, BHAR would analyze the abnormal returns earned by holding their stocks or securities compared to a relevant market index or a theoretical expected return. Abnormal returns refer to the portion of the return that cannot be attributed to General market movements for systematic factors. These measures help investors and analysts understand the performance of specific financial institutions relative to the market or expected norms, allowing for an assessment of their investment Attractiveness or the impact of certain events or market conditions on their stock performance.

6. Summary Statistics

Total Observations 107 from original dataset.

Criteria 1: SIC Code of 6020 and 6200

Criteria 2: United States Origin

Criteria 3: Public Company

Criteria 4: On the US Exchange

Criteria 5: Total Assets is greater than 10 billion (Large Banks)

Criteria 6: Company is Operating

Criteria 7: Also end up dropping observations for which CARs cannot be computed
Table 1: Summary Statistics Dummy Variable Event Uptick Event (October 19th 2020)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Variance</th>
<th>Observations</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAR</td>
<td>0.0326</td>
<td>0.0315</td>
<td>0.0009</td>
<td>98</td>
<td>-0.0466</td>
<td>0.1395</td>
</tr>
<tr>
<td>CTR</td>
<td>0.0172</td>
<td>0.0320</td>
<td>0.0010</td>
<td>98</td>
<td>-0.0609</td>
<td>0.1287</td>
</tr>
<tr>
<td>BHAB</td>
<td>0.0327</td>
<td>0.0320</td>
<td>0.0010</td>
<td>98</td>
<td>-0.0454</td>
<td>0.1442</td>
</tr>
</tbody>
</table>

**Cumulative Abnormal Return: Mean & 95% Confidence Limits**

There are 98 events in total with non-missing returns.
Table 2: Summary Statistics Real Measured Event Uptick Event (January 25th 2021)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Variance</th>
<th>Observations</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAR</td>
<td>-0.0305</td>
<td>0.0343</td>
<td>0.00118</td>
<td>98</td>
<td>-0.1013</td>
<td>0.1279</td>
</tr>
<tr>
<td>CTR</td>
<td>-0.0551</td>
<td>0.0337</td>
<td>0.00113</td>
<td>98</td>
<td>-0.1223</td>
<td>0.1046</td>
</tr>
<tr>
<td>BHAB</td>
<td>-0.0295</td>
<td>0.0337</td>
<td>0.00113</td>
<td>98</td>
<td>-0.0967</td>
<td>0.1302</td>
</tr>
</tbody>
</table>

Cumulative Abnormal Return: Mean & 95% Confidence Limits

There are 98 events in total with non-missing returns.
Table 3: Summary Statistics Dummy Variable Downtick Event (December 22nd 2021)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Variance</th>
<th>Observations</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAR</td>
<td>-0.0020</td>
<td>0.0114</td>
<td>0.000131</td>
<td>99</td>
<td>-0.0244</td>
<td>0.0586</td>
</tr>
<tr>
<td>CTR</td>
<td>0.0272</td>
<td>0.0117</td>
<td>0.000137</td>
<td>99</td>
<td>0.0045</td>
<td>0.9009</td>
</tr>
<tr>
<td>BHAB</td>
<td>0.0020</td>
<td>0.0117</td>
<td>0.000137</td>
<td>99</td>
<td>-0.0245</td>
<td>0.0608</td>
</tr>
</tbody>
</table>

**Cumulative Abnormal Return: Mean & 95% Confidence Limits**

There are 99 events in total with non-missing returns.
Table 4: Summary Statistics Real Measured Event Downtick Event (May 10th 2021)

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Variance</th>
<th>Observations</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAR</td>
<td>0.001174</td>
<td>0.0166</td>
<td>0.00027</td>
<td>99</td>
<td>-0.0417</td>
<td>0.0523</td>
</tr>
<tr>
<td>CTR</td>
<td>-0.0415</td>
<td>0.0161</td>
<td>0.00026</td>
<td>99</td>
<td>-0.0833</td>
<td>0.0088</td>
</tr>
<tr>
<td>BHAB</td>
<td>0.001171</td>
<td>0.0161</td>
<td>0.00026</td>
<td>99</td>
<td>-0.0405</td>
<td>0.0516</td>
</tr>
</tbody>
</table>

**Cumulative Abnormal Return: Mean & 95% Confidence Limits**

There are 99 events in total with non-missing returns.
These summary statistics signify the dynamic relationship between Bitcoin’s market performance and the response of traditional financial institutions, shedding light on potential implications for the economy and the evolving impact of cryptocurrencies on the traditional financial sector.

7. Methods

WRDS Event Study:

This paper implements a Market-Adjusted Model for cumulative abnormal returns (CAR) for banks under my selected parameters to measure the effect of the events in 2021 where Bitcoin had the biggest uptick and biggest downtick over its trading days since historically Bitcoin had its most volatile swings during 2021 compared to any other year. The Wharton Market Event Study which will spit out the Market Adjusted Model, but first the list must contain the company's ticker and the event date information. The event study records the event date at day zero, T=0, the event window brackets the event date and the window researches whether the stock price changes are abnormally large compared to their normal returns. It knows the actual return but doesn't know the expected return. To estimate, a frequently used risk model is a market model.

Market Model:

\[ E(R_{i,t}|X_t) = \alpha_i + \beta_i R_m + \varepsilon_{i,t} \]

Abnormal Return:

\[ AR_{i,t} = R_{i,t} - \alpha_i - \beta_i R_m \]

The expected return of any security I, equals alpha + beta, times the market portfolio return, plus some era term T is time I represents the form I. If the abnormal return is statistically significant, I
need to apply statistical analysis. The start date begins on the date I identified and the length of the observation measures Time + 2. For a model comparison I choose the Market-Adjusted Model over the Fama French Three Factor Model because of the alpha and beta estimation, we see the stock return data before the events. This is the estimation window, a gap is yearly needed between the end of the estimation window, because information can leak into the market and before the event happens you don't want to include those trading days. Once your estimates hit the alpha’s and betas then you can then calculate the cumulative normal return and abnormal return. Since this study wanted to only focus on the event date to see if they were statistically significant I opted for a market factor model instead. Also the market model is straightforward and easier to implement compared to the Fama French Three Factor Model. For this study, since the securities being studied are relatively homogeneous in terms of national banks and brokers, exchanges, and service companies, the additional factors in the Fama French Model might not significantly contribute to explaining the variations in their returns. In such cases the simpler Market-Adjusted Model would suffice.
### 8. Results

Table 5. Regression Real Measured Event Uptick Event (January 25th 2021) to Dummy Uptick Event

<table>
<thead>
<tr>
<th>Full Regression</th>
<th>Statistically Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marginal Effects (T-Stat P Value)</td>
<td>Standard Error</td>
</tr>
<tr>
<td>4.78502E-22</td>
<td>0.00318</td>
</tr>
<tr>
<td>(0.00000000000000000000000478502)</td>
<td></td>
</tr>
</tbody>
</table>

Table 6. Regression Real Measured Event Downtick Event (May 10th 2021) to Dummy Downtick Event

<table>
<thead>
<tr>
<th>Full Regression</th>
<th>Not Statistically Significant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marginal Effects (T-Stat P Value)</td>
<td>Standard Error</td>
</tr>
<tr>
<td>0.1207</td>
<td>0.00115</td>
</tr>
</tbody>
</table>
9. Results Discussion

I found that when Bitcoin had its largest downtick on May 10th 2021 within the trading window and two days after the trading day compared to the end of year 2021 downtick within a close range of a six month period the mean of the Cumulative Abnormal Returns was near practical zero more specifically -0.002, it also had a near zero standard deviation of the Cumulative Abnormal return from the mean and variance, meaning that both the data was not dispersed from the mean or spread out from the mean. Also having a low standard error of .00115 and .00318 is a good showing of my test population as it shows the sample means are closely distributed around the population mean, emphasizing that my sample is a representation of the population and this is for both of my regression data shows low standard errors. Then I ran a t test to see its real statistical significance from the measured impact of the largest downtick in Bitcoin. I measured if it was statistically significant if my p value fell below the parameter of 0.05 it means that this event had a statistically significant impact on Cumulative Abnormal Returns for traditional bank stocks, and I have to reject my null hypothesis for the downtick portion of my data as there needed to be some positive correlation for this set of data to prove when Bitcoin had one of its largest downticks it would have a positive impact on bank stocks. So for this portion of data I must not reject the null hypothesis as my p value for the regression was above 0.05 making it not statistically significant and thus the downtick event had no significant impact on national banks CAR value. However when Bitcoin had its biggest downturn event banks had a steady to near zero impact to the CAR showing their returns were stable and in line and when Bitcoin fails the banks remain stable which unlike my hypothesis that banks would succeed it's clear that instead they held steady and hit their projections during 2021 during a pandemic and as one of Bitcoins biggest crashes which reinstates my original thought that these two are linked and when
Bitcoin fails its banks who remain steady and calm and hit projections of profits for their actual return compared to their projected return. Now for when Bitcoin had its largest uptick event on January 25th 2021 within the trading window and two days after the trading day compared to the end of year 2020 uptick event the mean of the Cumulative Abnormal Returns was actually -0.0305 giving a first sign that Bitcoin does have a negative impact on National Commercial Banks cumulative abnormal returns during a time when Bitcoin had a massive uptake in its stock price. It also had a near zero standard deviation of the Cumulative Abnormal return from the mean and variance as well. I measured if it was statistically significant if my p value fell below the parameter of 0.05 and as you can see on Table 6 the marginal effect is far below 0.05 showing that this event had a very strong statistical significance compared to the rest of the mean population data and this makes sense since 2021 was the most volatile year for Bitcoin and it's pricing model and that it's stock price jumped up over 302% (Royal, Beers 2023) from when it was initially trading before in 2020 and prior years.

10. Conclusions

The Synopsis of my data findings were two things, one that for my event where Bitcoin had it’s biggest uptick the data showed a negative correlation on bank performance shown by CAR being negative and the t statistic was below 0.05 making it a statistically significant event. Meaning when Bitcoin does very well in its price movements these big institutional banks do poorly as their actual return was less than their expected return as a cumulative across my 107 observations for that 2 day event window. Now I also found in the event where Bitcoin had its biggest downtick that it actually had zero to little correlation and the CAR was very close to zero meaning this event had little to no impact on CAR and was not statistically significant. However
the one thing I did draw from this was that while it had no impact it shows at least that when Bitcoin had its biggest downtick institutional banks and brokerages were not impacted, which is a positive sign on bank stability which is their main focus as an institution. I sought to use my findings to show that during a time where Bitcoin was volatile and more widely accepted it might be the first source of data that might predict Bitcoin’s future impact on traditional banks and if the correlation is true or significant in the first place. This is relative to when Bitcoin succeeds and where it fails. Bitcoin is fairly new and developing currency that in the future might change the entire financial institution that we have relied upon for decades. My findings might be the start of the importance between the linkage of Bitcoin and traditional banks and brokerages as they are in direct competition with each other on the basis of public versus private forms of investment. Bank executives, institutional investors, financial regulators, industry professionals and the general public who invest all will find this information useful as it may shine light on if Bitcoin is a threat to national commercial banks and other financial institutions. The linkage between Bitcoin and national banks, brokerages, exchanges, and service companies is pivotal in understanding the evolving landscape of finance. Investors, financial regulators, and industry professionals keen on comprehending the intricate relationship between cryptocurrencies and traditional financial institutions would find immense value in exploring this linkage. Today’s economy is witnessing a dynamic shift as cryptocurrencies like Bitcoin challenge established norms, posing both opportunities and risks to the stability of national banks and financial entities. Understanding this linkage is crucial in navigating regulatory landscapes, adapting business models, and a digitized financial world, highlighting the urgency and relevance of exploring this relationship in the current status quo of the economy.
11. References


12. Appendix

Ticker’s of Companies Included: 99 Observations

<table>
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