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BITCOIN: SAFE HAVEN OR A RISK DURING THE COVID-19 PANDEMIC

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ABSTRACT

The pandemic depicts how market can be highly uncertain and volatile at certain times. This coronavirus pandemic has been a global crisis that has affected the whole world and has adversely disrupted the economy and forced a bear market situation which further makes it difficult for investors and traders to as in brings in challenges as well as opportunities. The market decline provides a timely assessment of the frequently expounded safe haven properties of cryptocurrencies. This research proposes to understand whether or not Bitcoin can be considered a safe-haven during the pandemic through analysis of price movements in comparison to other markets. We assess the safe-haven properties of Bitcoin by creating a portfolio mix with Bitcoin and S&P 500 and use downside risk measurement techniques and GARCH to analyze the above. Our findings show that Bitcoin does not entirely act as a safe haven, instead reducing in price in lockstep with the S&P 500 as the crisis develops. We observe that when held alongside the S&P 500, even small allocations to Bitcoin substantially increase the portfolio downside risk. Hence, our empirical findings show doubt on the ability of Bitcoin to provide shelter from the turbulence in traditional market's current scenario.

KEYWORDS

GARCH, safe-haven, pandemic, portfolio risk, risk measurement, volatility, cryptocurrency, financial crisis.

JEL CODES

E42, O31, E22, G11.

1. INTRODUCTION

The recent pandemic provided the first widespread bear market since the trading of cryptocurrencies began. In this article we examine the safe haven benefits of cryptocurrencies during this bear market, from the perspective of international equity index investors. Bitcoin has many a times been considered as a safe haven for traditional assets for many reasons, of which includes independence from the monetary policy, store of value role and diminished correlation with the traditional assets. With confirmed coronavirus cases increasing all throughout April, and spreading around the world, there has been a lockout in a large number of countries to stop the spreading of the corona virus. The containment measures enforced by the governments and incertitude about the future created great confusion in the world economy, which resulted in an economic slowdown. Cryptocurrencies have now long been debated and debated. But they are only now becoming known as financial instruments procurable. Bitcoin in particular, have an extremely useful but also disruptive quality that is slowly but surely affecting the way the traditional financial system works.

2. MOTIVATION FOR THE STUDY

In this pandemic, many Indians have lost jobs, and this has led them to invest in cryptocurrency to earn side income. Moreover, a lot of new professions have emerged in this space, people are becoming traders, technical analysts, or crypto influencers. During the pandemic, a lot of money printing has happened globally leading to inflation. The stock markets and foreign markets have also been very shaky. People know that stock market conditions depend on companies which have, again, been affected by the pandemic. So people move their money to ensure that its value is more or less conserved in a deflationary asset like gold in the traditional system, or Bitcoin in the digital system. Bitcoin has a limited supply, and is seen as a store of value. There is a need to evaluate the opportunity present here and understand whether Bitcoin is a safe haven compared to another market during this pandemic. There is no updated statistic or proper database available for students and researchers to use for their study.

3. REVIEW OF LITERATURE

The research done in the field of cryptocurrency to analyse safe haven aspects during the pandemic using various financial tools are very recent.

Irene Henriques and Perry Sadorsky (2018) investigate the consequences of replacing asset like gold in the investment portfolio by Bitcoin, methodology wise uses many different Multivariate GARCH models (Dynamic Conditional correlation (DCC), asymmetric DCC (ADCC), Generalized orthogonal GARCH (GO-GARCH))) to estimate equity portfolios with minimal variance. Long and short portfolios are taken into account, results show that risk-averse investors will be willing to pay a high performance fee to switch from a portfolio with gold to a portfolio with bitcoin. These results are robust to the inclusion of trading costs. Shaen Corbeta, Yang (Greg), Yang Hub, Charles Larkin (2020) analyses the relationships between the largest cryptocurrencies and such time-varying realisation as to the scale of the economic shock centralised within the rapidly escalating pandemic; GARCH (1,1) was used, cryptocurrency returns are found to be significantly influenced by negative sentiment relating to COVID-19 and find evidence of significant growth in both returns and volumes traded, indicating that large cryptocurrencies acted as a store of value during this period of exceptional financial market stress. While not only providing diversification benefits for investors, results suggest that these digital assets acted as a safe-haven similar to that of precious metals during historic crises. David Vidal-Tomas (2020) analyses the effect of the COVID-19 pandemic on the network topology of the cryptocurrency market using Network Analysis and Measures like Pearsons coefficient correlation, and results show that COVID-19 significantly affected this market during a short period of financial panic, from 12 March 2020 to 1 April 2020. KiHoon Hong (2016) documents the momentum of the time series in Bitcoin returns using regression analysis, time series momentum strategies, mean variance analysis and finds persistence in returns for one to 8 weeks that partially reverses over longer horizons, consistent with sentiment theories of initial under-reaction and delayed over-reaction. The time series momentum in Bitcoin returns is similar to that of the other asset returns while the time span is much shorter. This may be due to much quicker nature and shorter term memory of Bitcoin investors. Muhammad Abubakr, Syed Jawad Hussain Shahzad (2020) compares the hedging, safe-haven, and diversification potential of gold and Bitcoin for different investment styles and industry portfolios in the United States by using a model introduced by Baur and McDermott, evaluation using out-of-sample setting, Christofferson measure and finds that gold is at least a weak hedge for the style and industry portfolios except for utilities, energy, and telecom. However, Bitcoin shows hedging potential for the noncyclical industries. Finally, the analysis using the conditional diversification approach shows that gold is a superior and stable diversifier for style and industry portfolios. Shaen Corbin, Charles Larkin (2020) establishes relationship between the main

Chinese stock markets and Bitcoin evolved significantly during this period of enormous financial stress; Methodology wise, dummy variables are generated for price volatility and hourly returns to analyse the range of financial assets. VaR, MVar and GARCH model is also used. Such dynamic correlations during periods of stress present further evidence to cautiously support the validity of the development of this new financial product within mainstream portfolio design through the diversification benefits provided. Thomas C, Richard J (2020) test the widely mooted safe haven properties of Bitcoin, Ethereum and Tether from the perspective of international equity index investors. Methods used here are, two-moment value at risk (VaR) employed to measure the level of tail or downside risk. For a given confidence level, two-moment VaR is defined as the maximum expected loss on a portfolio over a given time interval. He also used the four-moment modified VaR, first defined by Favre and Galeano (2002), to understand the downside risk of a portfolio combining equities and Bitcoin. The Cornish-Fisher expansion, which adjusts the quantiles of a distribution to account for the higher-order moments of skewness and kurtosis, is used to calculate four-moment modified VaR. Only investors in the Chinese CSI 300 index realized modest downside risk benefits (contingent on very limited allocations to Bitcoin or Ethereum). Musaed S (2020) researches are based on the financial performance of the S&P 500, Shanghai SE, Nikkei 225, DAX, Australian ASX, FTSE 100, Swiss franc, gold, and Bitcoin over the period Feb 12th to April 9th 2020 which were then interpreted using OLS Regression. Results obtained from this study shows that Swiss franc and gold had a positive return during the study period which is in line with safe haven assets characteristics, but these returns were not caused by the stock markets negative returns. Bitcoin on the other hand showed negative returns during the study period and statistically significant positive relation with S&P 500 returns indicating that Bitcoin cannot be used as a safe haven asset. Thomas Conlon, Richard McGee (2020) presents the first acute market losses since active trading of Bitcoin began. This market downturn provides a timely test of the frequently expounded safe haven properties of Bitcoin. After interpretation using Downside Risk Measures such as VaR, MVaR, MCVar, we understand that Bitcoin does not act as a safe haven, instead decreasing in price in lockstep with the S&P 500 as the crisis develops. When held alongside the S&P 500, even a small allocation to Bitcoin substantially increases portfolio downside risk. Empirical findings cast doubt on the ability of Bitcoin to provide shelter from turbulence in traditional markets. Diana Tashanova, Ainur Sekerbay, Danni Chen (2020) Investment Opportunities and Strategies in an Era of Coronavirus Pandemic. This paper provides a thorough study on the factors affecting the stock prices, and to discuss unique investment strategies with appropriate risk management through the pandemic era. In this paper, an industry sector analysis is conducted, and factors affecting the stock market are analyzed by using alternative data sets as an additional source of tracking a behavioral finance and developed a seven-step strategy. ie. Simple Moving Average Trading Strategy and Backtesting, Fama French 3-factor Model, Alternative Data Regression Model. The results indicate that there are several industrial sectors that gained during the pandemic and could keep this pace in the nearest future and using the seven-step strategy could help in creating a full picture of the stock's performance on the market. Conghui Chen, Lanlan Liu & Ningru Zhao (2020) studies the impact of fear sentiment caused by the coronavirus pandemic on Bitcoin price dynamics. We construct a new proxy for coronavirus fear sentiment using hourly Google search queries on coronavirus-related words. Methodology involves preliminary analysis followed by employing VAR models. The results show that market volatility has been exacerbated by fear sentiment as the result of an increase in search interest in coronavirus. Moreover, we find that negative Bitcoin returns and high trading volume can be explained by fear sentiment regarding the coronavirus. Nikolaos A. Kyriazis (2020) explores whether Bitcoin can be considered as a globally accepted asset that has a resemblance to gold, which is widely considered to be the safest choice. Methodology used involves various GARCH models reveals that Bitcoin has a long way to go before it acquires the same characteristics as the safe-haven asset of gold. Overall, Bitcoin is found to be an efficient hedge against oil and stock market indices, but to a lesser extent than gold. Bitcoin presents low or negative correlations or an asymmetric non-linear linkage with gold.

4. METHODOLOGY

RESEARCH GAP

Research methods adopting a mixed-method approach are rare; ie. Including case study and survey, there is a need also for research that performs a comparative analysis and mixed-method approach with respect to other crypto currencies and Bitcoin. There is need to conduct research on the use of Bitcoin and cryptocurrencies in developing countries and across countries as well. To better understand this subject, especially from its inception, there is a need for studies focusing on a longer period of analysis. The research would fail to acknowledge factors that have indirect effects on the research like policies, declarations which keep changing over time passage etc.

NEED FOR THE STUDY

There is need to conduct extensive research on the investment viability of Bitcoin and other cryptocurrencies, focusing on the correlation of such with other financial markets especially during COVID pandemic. Especially with the general mindset of people to invest in safe-havens during pandemic, it becomes essential to conduct research to analyse if cryptocurrencies have paved their way as safe havens.

DATA

In this study we are performing a multivariate analysis. The data is collected from 01st January 2010 to 1st January 2021 and is divided into 3 parts. 2010-2020 is the first data set, which is considered to be the time period where the market is relatively low volatile. The next part of the data is high volatility period which is from 2017- 2020 and third from 2019-2020.

TOOLS USED

Downside Risk Measurement

Value at Risk (VaR)

Value at Risk (VAR) calculates the maximum loss expected (or worst case scenario) on an investment, over a given time period and given a specified degree of confidence. We looked at three methods commonly used to calculate VAR. For a portfolio with normally distributed returns, two-moment value at risk (VaR) may be employed to measure the level of tail or downside risk for a given confidence level, two-moment VaR is defined as the maximum expected loss on a portfolio over a given time interval and is calculated using,

$$\text{Value at Risk} = v_m \frac{v_i}{v_{i-1}}$$

You can measure and compare VAR of different types of assets and various portfolios. Value At Risk is applicable to stocks, bonds, currencies, derivatives, or any other assets with price. This is why banks and financial institutions like it so much – they can compare profitability and risk of different units and allocate risk based on VAR (this approach is called risk budgeting).

The limitation of Value at Risk as a risk budgeting tool is the fact that VAR is not easily additive. VAR of a portfolio of two assets does not necessarily equal the sum of the single asset VARs, as the correlations must also be taken into consideration.

Conditional Value at Risk (CvaR)

Conditional Value at Risk (CVaR), also known as the expected shortfall, is a risk assessment measure that quantifies the amount of tail risk an investment portfolio has. CVaR is derived by taking a weighted average of the "extreme" losses in the tail of the distribution of possible returns, beyond the value at risk (VaR) cutoff point. Conditional value at risk is used in portfolio optimization for effective risk management.

Generally speaking, if an investment has shown stability over time, then the value at risk may be sufficient for risk management in a portfolio containing that investment. However, the less stable the investment, the greater the chance that VaR will not give a full picture of the risks, as it is indifferent to anything beyond its own threshold.

Conditional Value at Risk (CVaR) attempts to address the shortcomings of the VaR model, which is a statistical technique used to measure the level of financial risk within a firm or an investment portfolio over a specific time frame. While VaR represents a worst-case loss associated with a probability and a time horizon, CVaR is the expected loss if that worst-case threshold is ever crossed. CVaR, in other words, quantifies the expected losses that occur beyond the VaR breakpoint.

Since CVaR values are derived from the calculation of VaR itself, the assumptions that VaR is based on, such as the shape of the distribution of returns, the cut-off level used, the periodicity of the data, and the assumptions about stochastic volatility, will all affect the value of CVaR. Calculating CVaR is simple once VaR has been calculated. It is the average of the values that fall beyond the VaR:

$$CVaR = \frac{1}{1-c}\int_{-1}^{VaR} xp(x)\,dx$$

where:

$p(x)dx$ = the probability density of getting a return with value "x"

c = the cut-off point on the distribution where the analyst sets the VaR breakpoint

VaR = the agreed-upon VaR level

GARCH

The generalized autoregressive conditional heteroskedasticity (GARCH) model has only three parameters that allow for an infinite number of squared roots to influence the conditional variance. This characteristic enables GARCH to be more parsimonious than ARCH model. In brief, GARCH is a better fit for modeling time series data when the data exhibits heteroskedacisticity and volatility clustering. However, in some cases there are aspects of the model which can be improved so that it can better detect the features and dynamics of a particular time series. For example, a standard GARCH model fails in capturing the "leverage effects" which are observed in the financial time series. In other words, based on this model, good and bad news have the same effect on the volatility. To address this problem, several GARCH extensions were proposed.

Above we can see Adam optimizer in action reducing the error by a significant amount in each step.

GARCH (1,1) CVE:

$$\sigma_t^2 = \alpha_0 + \alpha_1 u_{t-1}^2 + \beta_1 \sigma_{t-1}^2$$

Heteroskedasticity describes the irregular pattern of variation of an error term, or variable, in a statistical model. Essentially, where there is heteroskedasticity, observations do not conform to a linear pattern. Instead, they tend to cluster.

The result is that the conclusions and predictive value drawn from the model will not be reliable. GARCH is a statistical model that can be used to analyze a number of different types of financial data, for instance, macroeconomic data. Financial institutions typically use this model to estimate the volatility of returns for stocks, bonds, and market indices. They use the resulting information to determine pricing, judge which assets will potentially provide higher returns, and forecast the returns of current investments to help in their asset allocation, hedging, risk management, and portfolio optimization decisions.

The general process for a GARCH model involves three steps. The first is to estimate a best-fitting autoregressive model. The second is to compute autocorrelations of the error term. The third step is to test for significance.

5. OBJECTIVES OF THE STUDY

1. To assess the volatility and the risk of Bitcoin and S&P 500 by using downside risk measures.
2. To study and assess whether Bitcoin is a viable financial investment portfolio mix during the COVID-19 pandemic.

6. DATA ANALYSIS

Descriptive Statistics

We used the descriptive statistics to understand the data well, so that we could infer what was the range and the volatility in the market for the selected years. From the descriptive statistics we can see that the standard deviation and the variance are different from each other.

TABLE 1: DESCRIPTIVE STATISTICS (2015-2020)

S&P 500		*BTC*		*Portfolio*	
Mean	0.000467965	Mean	0.004057918	Mean	0.000827
Standard Error	0.000302573	Standard Error	0.001179278	Standard Error	0.000312
Median	0.000620883	Median	0.002451207	Median	0.000998
Standard Deviation	0.011757608	Standard Deviation	0.045825248	Standard Deviation	0.012112
Sample Variance	0.000138241	Sample Variance	0.002099953	Sample Variance	0.000147
Kurtosis	19.43924333	Kurtosis	7.234965243	Kurtosis	20.998
Skewness	-0.672680413	Skewness	-0.04938769	Skewness	-1.05951
Range	0.213668292	Range	0.62416708	Range	0.218283
Minimum	-0.119840552	Minimum	-0.371695386	Minimum	-0.12277
Maximum	0.09382774	Maximum	0.252471694	Maximum	0.095512
Sum	0.706626681	Sum	6.12745613	Sum	1.24871
Confidence Level(95.0%)	0.000593509	Confidence Level(95.0%)	0.002313199	Confidence Level(95.0%)	0.000611

TABLE 2: DESCRIPTIVE STATISTICS (2017-2020)

S&P 500		*BTC*		*Portfolio*	
Mean	-0.0004	Mean	0.003548	Mean	-0.00036
Standard Error	0.001074	Standard Error	0.001851	Standard Error	0.000966
Median	0.0008	Median	0.00253	Median	0.00072
Standard Deviation	0.034069	Standard Deviation	0.05875	Standard Deviation	0.030662
Sample Variance	0.001161	Sample Variance	0.003452	Sample Variance	0.00094
Kurtosis	738.5001	Kurtosis	86.86312	Kurtosis	738.5001
Skewness	-25.184	Skewness	-4.94743	Skewness	-25.184
Range	1.093828	Range	1.252472	Range	0.984445
Minimum	-1	Minimum	-1	Minimum	-0.9
Maximum	0.093828	Maximum	0.252472	Maximum	0.084445
Sum	-0.40652	Sum	3.572743	Sum	-0.36587
Confidence Level(95.0%)	0.002107	Confidence Level(95.0%)	0.003633	Confidence Level(95.0%)	0.001896

TABLE 3: DESCRIPTIVE STATISTICS (2019-2020)

S&P 500		BTC		PORTFOLIO	
Mean	-0.00105	Mean	0.003001	Mean	-0.00094
Standard Error	0.002111	Standard Error	0.00281	Standard Error	0.0019
Median	0.001565	Median	0.00147	Median	0.001408
Standard Deviation	0.047433	Standard Deviation	0.063152	Standard Deviation	0.042689
Sample Variance	0.00225	Sample Variance	0.003988	Sample Variance	0.001822
Kurtosis	392.2268	Kurtosis	128.6626	Kurtosis	392.2268
Skewness	-18.6209	Skewness	-8.13516	Skewness	-18.6209
Range	1.093828	Range	1.225129	Range	0.984445
Minimum	-1	Minimum	-1	Minimum	-0.9
Maximum	0.093828	Maximum	0.225129	Maximum	0.084445
Sum	-0.52914	Sum	1.515708	Sum	-0.47623
Confidence Level(95.0%)	0.004147	Confidence Level(95.0%)	0.005521	Confidence Level(95.0%)	0.003732

Volatility Analysis

VAR and CVAR Analysis

VAR Analysis

TABLE 4: VAR ANALYSIS (2015-2020)

S&P 500		Bitcoin		Portfolio	
Var(95)	-0.017	Var(95)	-0.066	Var(95)	-0.016
Var(99)	-0.035	Var(99)	-0.130	Var(99)	-0.034

TABLE 5: VAR ANALYSIS (2017-2020)

S&P 500		Bitcoin		Portfolio	
Var(95)	-0.019	Var(95)	-0.049	Var(95)	-0.017
Var(99)	-0.043	Var(99)	-0.023	Var(99)	-0.039

TABLE 6: VAR ANALYSIS (2019-2020)

S&P 500		Bitcoin		Portfolio	
Var(95)	-0.026	Var(95)	-0.056	Var(95)	-0.023
Var(99)	-0.059	Var(99)	-0.131	Var(99)	-0.053

CVAR Analysis

TABLE 7: CVAR ANALYSIS (2015-2020)

S&P 500		Bitcoin		Portfolio	
Cvar(95)	-0.029	Cvar(95)	-0.106	Cvar(95)	-0.029
Cvar(99)	-0.053	Cvar(99)	-0.173	Cvar(99)	-0.055

TABLE 8: CVAR ANALYSIS (2017-2020)

S&P 500		Bitcoin		Portfolio	
Cvar(95)	-0.053	Cvar(95)	0.004	Cvar(95)	-0.047
Cvar(99)	-0.157	Cvar(99)	-0.013	Cvar(99)	-0.141

TABLE 9: CVAR ANALYSIS (2019-2020)

S&P 500		Bitcoin		Portfolio	
Cvar(95)	-0.081	Cvar(95)	-0.134	Cvar(95)	-0.073
Cvar(99)	-0.267	Cvar(99)	-0.355	Cvar(99)	-0.241

GARCH Output

TABLE 10: GARCH OUTPUT (2015-2020)

Dependent Variable: FIRST
Method: ML ARCH - Normal distribution (BFGS / Marquardt steps)
Date: 01/10/21 Time: 12:11
Sample (adjusted): 1/05/2015 12/31/2020
Included observations: 1510 after adjustments
Convergence achieved after 48 iterations
Coefficient covariance computed using outer product of gradients
Presample variance: backcast (parameter = 0.7)
GARCH = C(2) + C(3)*RESID(-1)^2 + C(4)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.599636	0.477563	1.255617	0.2093
Variance Equation				
C	0.573581	0.248939	2.304101	0.0212
RESID(-1)^2	0.125914	0.004374	28.78878	0.0000
GARCH(-1)	0.916467	0.001692	541.6476	0.0000

R-squared	-0.002458	Mean dependent var	18.99781
Adjusted R-squared	-0.002458	S.D. dependent var	371.2469
S.E. of regression	371.7028	Akaike info criterion	12.26293
Sum squared resid	2.08E+08	Schwarz criterion	12.27702
Log likelihood	-9254.509	Hannan-Quinn criter.	12.26817
Durbin-Watson stat	2.076177		

TABLE 11: GARCH EFFECT TEST (2017-2020)

Dependent Variable: SECOND
Method: ML ARCH - Normal distribution (BFGS / Marquardt steps)
Date: 01/10/21 Time: 12:13
Sample (adjusted): 1/04/2017 12/31/2020
Included observations: 1006 after adjustments
Convergence achieved after 27 iterations
Coefficient covariance computed using outer product of gradients
Presample variance: backcast (parameter = 0.7)
GARCH = C(2) + C(3)*RESID(-1)^2 + C(4)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	8.388409	5.940409	1.412093	0.1579
Variance Equation				
C	313.3321	38.94227	8.046067	0.0000
RESID(-1)^2	0.093523	0.003769	24.81202	0.0000
GARCH(-1)	0.928188	0.002196	422.7619	0.0000

R-squared	-0.001824	Mean dependent var	27.79113
Adjusted R-squared	-0.001824	S.D. dependent var	454.5175
S.E. of regression	454.9319	Akaike info criterion	14.35918
Sum squared resid	2.08E+08	Schwarz criterion	14.37872
Log likelihood	-7218.667	Hannan-Quinn criter.	14.36660
Durbin-Watson stat	2.079968		

TABLE 12: GARCH TEST (2019-2020)

Dependent Variable: THIRD
Method: ML ARCH - Normal distribution (BFGS / Marquardt steps)
Date: 01/10/21 Time: 12:16
Sample (adjusted): 1/03/2019 12/31/2020
Included observations: 504 after adjustments
Convergence achieved after 21 iterations
Coefficient covariance computed using outer product of gradients
Presample variance: backcast (parameter = 0.7)
GARCH = C(2) + C(3)*RESID(-1)^2 + C(4)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	13.33928	14.46913	0.921914	0.3566
Variance Equation				
C	12900.94	1687.410	7.645410	0.0000
RESID(-1)^2	0.267564	0.035838	7.466011	0.0000
GARCH(-1)	0.726878	0.031211	23.28943	0.0000

R-squared	-0.006161	Mean dependent var	49.71887
Adjusted R-squared	-0.006161	S.D. dependent var	463.9547
S.E. of regression	465.3817	Akaike info criterion	14.74747
Sum squared resid	1.09E+08	Schwarz criterion	14.78098
Log likelihood	-3712.362	Hannan-Quinn criter.	14.76061
Durbin-Watson stat	2.145112		

The table highlights summary statistics of the corresponding returns for S & P 500, Bitcoin and a mix portfolio of 10% Bitcoin and 90% S & P 500.For each of these periods under consideration. We tend to believe that Bitcoin has far higher returns, the greater standard deviation and the increased kurtosis. Over the given entire period, when considered as an investor in Bitcoin, it's wealth has increased over 11 times compared to their initial investments. The maximum loss of one day for Bitcoin is 0.25% compared to 0.09% for S & P 500.VAR and CVaR at 2 levels of confidence are also shown in the table.

Regardless of metric or confidence levels. Bitcoin finds more risk than S & P 500.our primary interest is turning into a risk disadvantage for mixed works., S & P 500.at a 1% confidence level, we noticed 16% increase in VAR over 2019-2020 period for portfolio holding 10% Bitcoin vs. S & S P 500 similarly for CVaR at 1% confidence level, we find 0.30% increase from 0.26% for S & P 500 to 0.24% for mix portfolio similar findings.

Next, we went ahead with ARCH/GARCH modeling to get a better idea of the data collected. ARCH shows the shock as non-uniformity in residual term over time. ie. Actual calculation of how much residual is changing. From GARCH outputs we find that it is strong and profound, probability is in the range of 0.001-0.010 i.e. Occurrence is (1-value) which means above 99% ARCH/GARCH model is perfectly fine. When we come to residual part, returns square serial autocorrelation arch coefficient. When we add Residual ie. ARCH coefficient and GARCH coefficient we get 1.

GARCH shows the longevity and intensity of volatility and ARCH shows us non-uniformity of residuals over a period of time i.e. volatility cluster will continue, it is persistent and will not die down soon. Furthermore, when we check the Akaike info criterion, Schwartz criterion, Hannan-Quinn criterion for the time periods, we find that the output value is above positive values above 5 which means data is not robust.

7. CONCLUSION

Bearing in mind the role of negative feelings related to the outbreak and progress of the present Covid-19 pandemic, our forecasted results show that there are significant and pronounced effects of price fluctuations, as investors have identified both the gravity and the nature of the pandemic growth trajectory and the potential economic consequences. This government reassurance can act as a catalyst and supportive structure for the perceived investment safety blanket during the current market panic. Thus, the use of cryptocurrencies as a safe haven during times of severe market volatility will trigger alarm within regulatory authorities and policy-making. The lack of regulation, continuity and international legislation, along with the largely obvious risks associated with fraud relatively sophisticated, is a serious challenge for policymakers to act upon and resolve. In the bear market that followed from the Covid-19 epidemic provides an initial testing platform for the properties of safe haven for Bitcoin. Check the impact on a diversified S & P 500 wallet with a customization for Bitcoin, our forecasted results mostly indicate that Bitcoin does not work as a safe haven. During this period under consideration, we find that the S & P 500 and the digital asset. ie Bitcoin move in the lock, leading to increase the risk of landing for the investor with allocation to Bitcoin.

8. FUTURE SCOPE FOR THE STUDY

The study we conducted was to understand whether or not Bitcoin can be considered a safe-haven during the pandemic through analysis of price movements and volatility in comparison to other markets. This study can be a base for further expansion into more factors that help in understanding the behavior of other cryptocurrencies with relation to Bitcoin's volatility during the pandemic. Since the pandemic has adversely hit the entire world and created havoc, it is important to analyse safe haven options during this period of turmoil. Though we know that the study of cryptocurrencies is not new, it is important to have a better understanding about its behavior and volatility measures and properties of safe haven during this pandemic especially factoring in the major role cryptocurrencies will play in the future as they become more recognized form of digital currency and present potential investment opportunities. Hence, there is a need for extensive study in this area to enhance the learning and gain further insight which would help catapult the industry.

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