NEAR EAST UNIVERSITY

INSTITUTE OF GRADUATE STUDIES

DEPARTMENT OF ECONOMICS

EMPIRICAL ANALYSES ON THE RELATIONSHIP BETWEEN BITCOIN AND THE GLOBAL ECONOMIC POLICY UNCERTAINTY

MSc. THESIS

ASHI PERVEEN

Nicosia

JUNE, 2022

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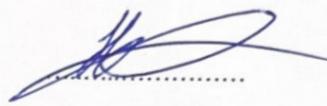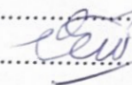**Assist. Prof. Dr. Andisheh SALIMINEZHAD**
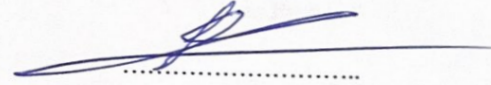
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Thesis defence was held online. The Jury members declared their acceptance verbally which is recorded.

Approval

We certify that we have read the thesis submitted by **Ashi Perveen** titled **"The impact of Bitcoin on global economic policy uncertainty"** and that in our combined opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Educational Sciences.

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Declaration

I hereby declare that all information, documents, analysis and results in this thesis have been collected and presented according to the academic rules and ethical guidelines of Institute of Graduate Studies, Near East University. I also declare that as required by these rules and conduct, I have fully cited and referenced information and data that are not original to this study.

Ashi Perveen

.02./11./22

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Words cannot express my gratitude to my professor Assist. Prof. Dr. Andisheh SALIMINEZHAD for her invaluable patience and feedback. I also could not have undertaken this journey without the support of my nan and dada.

ASHI PERVEEN

Abstract

Empirical Analyses on the Relationship between Bitcoin and the Global Economic Policy Uncertainty

Ashi Perveen

M.Sc, Department of Economics

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Bitcoin has attracted traders from all around the world who bet against its price changes, hence making it an asset rather than a currency. Unlike fiat currency which is issued or printed whenever it's needed by the central bank, bitcoin is finite and it is mined or issued based on a specific algorithm. No researches have been done in the past to ascertain the relationship of Bitcoin and global economic policy uncertainty with global data. This research uses global dataset rather than local or regional data whose generalization at an international level is limited. This research also employs two models, the first which seek to ascertain the effect of Bitcoin on tge uncertainty of global economic policy and the second one which ascertains on how global political uncertainty can impact Bitcoin. This research also makes use of the Autoregressive Distributive Lag (ARDL) technique, Quantile regression analysis and the correlation analysis technique. The findings of the research show that, in the long-run and short-run Bitcoin is negatively impacted by global economic policy uncertainty and positively by oil prices, whereas Gold does not provide any significant effect. Global economic policy uncertainty in the short-run and long-run is negatively impacted by Bitcoin and positively by gold prices, while in the long-run, oil prices does not provide any significant influence but in the short-run it has a positive impact. Policy recommendations are provided in this Thesis, accordingly.

Key words: Global Economic Policy Uncertainty; Gold price; Bitcoin; Oil price.

ÖZ

Bitcoin ve Küresel Ekonomik Politika Belirsizliği Arasındaki İlişki Üzerine Ampirik AnalizlerAshi Perveen

Yüksek Lisans, İktisat Bölümü

Haziran (Ay), 2022 (Yıl), 97 (sayı) sayfa

Danışman

Yardım. Prof. Dr. Andisheh SALIMINEZHAD

Bitcoin, dünyanın her yerinden fiyat değişikliklerine karşı bahse giren tüccarları kendine çekti ve bu nedenle onu bir para biriminden ziyade bir varlık haline getirdi. Merkez bankası tarafından ihtiyaç duyulduğunda çıkarılan veya basılan fiat para biriminin aksine, bitcoin sınırlıdır ve belirli bir algoritmaya göre çıkarılır veya çıkarılır. Bildiğimiz kadarıyla geçmişte Bitcoin ve küresel ekonomik politika belirsizliğinin küresel verilerle ilişkisini tespit etmek için herhangi bir çalışma yapılmamıştır. Bu araştırma, uluslararası düzeyde genellemesi sınırlı olan yerel veya bölgesel verilerden ziyade küresel veri setini kullanmaktadır. Bu araştırma ayrıca, ilki Bitcoin'in küresel ekonomik politika belirsizliği üzerindeki etkisini tespit etmeye çalışan ve ikincisi küresel siyasi belirsizliğin Bitcoin'i nasıl etkileyebileceğini tespit eden iki model kullanmaktadır. Bu araştırma aynı zamanda Otoregresif Dağılımsal Gecikme (ARDL) tekniğini, Kuantil regresyon analizini ve korelasyon analizi tekniğini kullanır. Araştırmanın bulguları, uzun ve kısa vadede Bitcoin'in küresel ekonomi politikası belirsizliğinden olumsuz, petrol fiyatlarından olumlu etkilendiğini, Altın'ın ise anlamlı bir etki sağlamadığını gösteriyor. Küresel ekonomi politikası belirsizliği kısa ve uzun vadede Bitcoin'den olumsuz, Altın fiyatlarından olumlu etkilenirken, uzun vadede petrol fiyatları önemli bir etki sağlamaz, ancak kısa vadede olumlu bir etkiye sahiptir. Buna göre, bu Tezde politika önerileri sunulmaktadır.

Anahtar Kelimeler: Küresel Ekonomik Politika Belirsizliği; Altın fiyat; Bitcoin; Petrol fiyatı

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List of Abbreviations

ADF:	Augmented Dickey Fuller
ARDL:	Autoregressive Distributive Lag
BGSVAR:	Bayesian Graphical Structural Vector Autoregressive
BP:	British multinational oil and gas company
BTC:	Bitcoin
BVAR:	Bayesian Vector Autoregression
DFA:	Detrended Fluctuation Analysis
DOLS:	Dynamic Ordinary Least Squares
ECM:	Error Correction Mechanism
ECT:	Error Correction Term
EMU:	Equity Market Uncertainty
EPU:	Economic Policy Uncertainty
EU:	European Union
EWMA:	Exponentially Weighted Moving Average
FOMC:	Federal Open Market Committee
FMOLS:	Fully Modified Ordinary Least Squares
FTSE100:	Financial Times Stock Exchange 100 Index
FSI:	Financial Stress Index
GARCH:	Generalized Autoregressive Conditional Heteroskedasticity
GEPU:	Global Economic Policy Uncertainty
GBP:	Sterling pound
GDP:	Gross Domestic Product
GFSI:	Global Financial Stress Index
GMM:	Generalized Method of Moments

JPY: Japanese Yen

LASSO: Least Absolute Shrinkage and Selection Operator

MPU: Monetary Policy Uncertainty

MVQM-CAViaR: Multivariate Quantile Model-Conditional Autoregressive
Value at Risk

NASDAQ100: National Association of Securities Dealers Automated
Quotations 100 index

NIKKEI225: Japanese stock market index

OLS: Ordinary Least Squares

PP: Philips Peron

QQ: Quantile-on-quantile Regression

SC: Schwarz Criterion

S&P500: Standard and Poor index

UK: United Kingdom

US: United States

USA: United States of America

USD: United States Dollar

VAR: Vector Autoregression

VEC: Vector Error Correction

VIX: CBOE Volatility

CHAPTER I

Introduction

People have used precious metals like gold and silver as a store of value and as a medium of exchange for a very long time. Later in 770 B.C paper money was invented and the transactions were carried out differently ever since. In today's world we have multiple options that we can use as a medium of exchange which are currency notes, cheques, credit and debit cards or electronic bank transfers. The use of paper money has been limited and most transactions have been digitalized with the advancement in technology, the banking applications and the invention of card system.

Fiat currencies are printed and controlled by a sovereign government, the supply and demand of money is influenced by the economic policies and the financial market forces of demand and supply. There are some popular currencies including the US dollar, the sterling pound (GBP) and the Euro which are used as a medium of exchange among traders around the globe, these currencies are easily affected by the monetary policies of the central banks. When the US-China trade war started in 2018, the US dollar became more volatile against other currencies, Iosebashvili (2019). Traders and investors from around the world were looking for an alternative means of payment which is independent of any government intervention, not regulated by any central bank and unaffected by the monetary policies. Satoshi Nakamoto created the Bitcoin, the first crypto currency, which has best fulfilled the purpose. Bitcoin was created for daily use as a medium of exchange after the global economic and financial crisis of 2007-2008. Bitcoin is a decentralized digital currency and it is independent from any governmental interference, centralized system, banking institutions or a single administrator. People can send or receive bitcoin to one another without any intermediaries. The transactions are authorised by the network links or nodes through cryptography and recorded in blockchain which is a public distributed ledger. Bitcoin was introduced to the financial market in January of 2009. It was not very popular in the beginning days but it gained popularity in 2011 when the black markets started using it as a medium of exchange. Silk Road which was a dark web market place, started accepting bitcoin as payment. The first ever transaction was 9.9 million in bitcoins, which was worth about $214 million.

Bitcoin has attracted traders from all around the world who bet against its price changes, hence making it an asset rather than a currency. Unlike the fiat currency which is issued or printed whenever it's needed by the central bank bitcoin is finite and it is mined or issued based on a specific algorithm. Currently there are 18,947,893.75 bitcoins in existence. New blocks are mined every 10 minutes which adds 6.25 bitcoins into circulation.

The price of bitcoin is very volatile, and it is based on the demand and supply mechanism. The price increases when the demand is high and decreases when the demand is low. The graph of bitcoin price over the years is shown in the figure below:

Figure 1.Bitcoin price
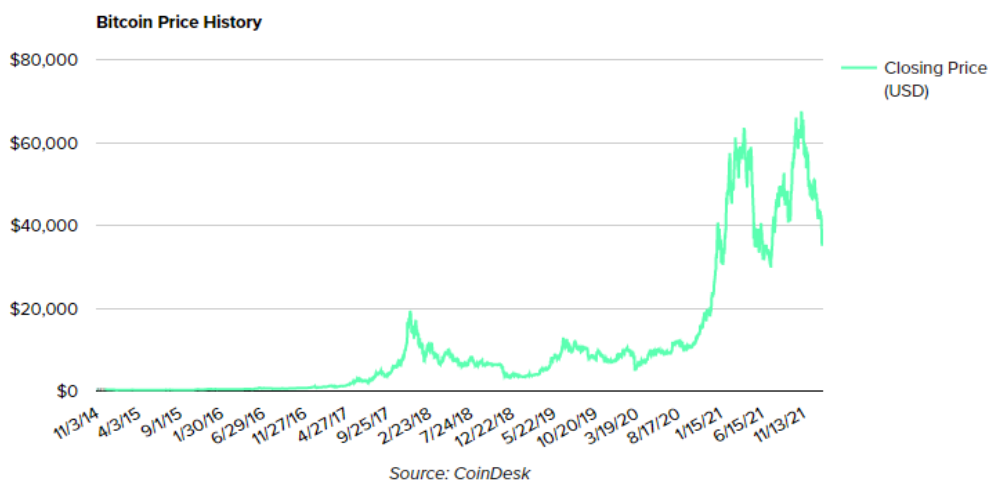
Bitcoin was launched in 2009, and ever since the launch date bitcoin price has increased and gained a position in the asset market. From 2010 till 2018 the global economy was very unstable because of the U.S.-China trade war; in this time period the bitcoin price went from 0.09 dollars to 7487.19 dollars as of May 2018. Bitcoin market size also touched more than a billion dollars in the beginning of 2018. There has been a huge increase in bitcoin's transaction volume, which increases every year, a 100% increase over the past five years is shown in the table below.

Figure 2.Annual Transaction Volume

Bitcoin Surpasses American Express in Annual Transaction Volume

Annual Transaction Volume ($B)										
Network	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Visa	6,407	6,967	7,357	7,344	8,738	10,509	11,381	11,760	11,376	13,505
Mastercard	3,647	4,104	4,502	4,564	4,822	5,236	5,908	6,462	6,333	7,722
Bitcoin	1	24	38	33	97	704	735	636	896	3,007
American Express	888	952	1,023	1,040	1,038	1,085	1,184	1,241	1,024	1,284
Discover	304	310	322	312	307	336	376	403	417	504

NYDIG   Source: Glassnode, Corporate Filings

Bitcoin has exceeded American Express in Annual transaction volume, Wagner (2022). If more transactions are finalized using the bitcoin it would reflect on the fiscal, political and monetary policies, resulting in a higher global economic policy uncertainty (GEPU) rate. Bitcoin also acts as a commodity, which is why many traders invest in it from around the world. Many developed countries like the United States, Canada, Australia and most of the European Union countries have legalised bitcoin. El Salvador declared bitcoin as a legal tender in June 2021. Bitcoin shares a lot of resemblance with gold and oil which are both scarce resources, but bitcoin market is highly affected by its price movements. Bitcoin shares a low or negative correlation with gold according to some studies, and other studies suggest that there is an asymmetric or non-linear relation between them. Bitcoin is deemed to be a better shield against inflation than oil, but it is not as good as gold.

Fiat currency like USD is printed when it is needed for example since the gold standard was removed in 1971 the dollar supply went up from 273.4 billion dollars to more than 6.5 trillion dollars as of November 30, 2020. After the corona virus pandemic there has been $2.5 trillion increase in the dollar supply within 9 months. This whole situation has made investors think about what accounts for a store of value, what initiates an inflation hedge and how can investors protect their portfolios. On the other hand, when bitcoin was first introduced it was written in the bitcoin's codes that how many bitcoins would ever be supplied, so there is a limited number of bitcoins. Investors are beginning to think about the comparison between the digital and fiat currencies, digital currencies are scarce and fiat currencies are printed unlimitedly. The demand for bitcoin has increased resulting in its price appreciation, because it is believed that more money would be printed and inflation might continue in the coming

days after the Biden administration announced that the students' loans would be forgiven.

This thesis also uses oil price as a variable to check its relationship with bitcoin. Oil market shocks might show up as an important source of vulnerability for the digital money market, because the oil price shocks most of the time generate a risk level that resembles a macroeconomic report. Oil price could be the main factor that can cause the cryptographic currency uncertainty because it has an impact on the major macroeconomic variables. The investors must pay special attention to the variation in oil prices before making an investment decision. Yin, Nie, and Han, (2021)

Oil is the main commodity and the source of income for most states around the world. The economy of the Middle Eastern countries solely depends on the trade of oil. The fluctuation in oil price creates an instability in the global financial market. The volatility in the price of oil was recorded to be huge after the Second World War, the importance of oil cannot be denied under any circumstances. The data from the past few years show that the volatility in oil price has only worsen in the recent past. The movement in oil price could have a major impact on economic growth, exchange rate and the policy uncertainty etc. According to Ghazani and Khosravi (2020) and Okorie and Lin (2020) raw oil is a very important commodity in the global market. Crude oil price has an impact on any financial asset that is exchanged, bought and sold across the world. It is the fundamental asset that can cause a fluctuation in the world trade. In this thesis the impact of oil price on bitcoin price would be checked.

The importance of gold price and its effects on the global economy has been a major topic for a very long time. Gold was the main currency of countries back in the days when paper money was not in circulation. Nowadays, even though it's not used as money anymore but it can still influence the currencies that are used around the globe. The price of gold plays a major role in the foreign exchange market and it can be substituted for fiat currencies. Gold is the main asset that is bought in huge quantities during the times of inflation, it is a good hedge against inflation or when there is an instability in the economy. Gold has a crucial role to play in the management of portfolio, and some economists believe that bitcoin can replace gold because they have similar properties when it comes to their hedging ability. According to Dyhrberg (2016a) bitcoin and gold play similar roles in portfolio management. In their research

Klein, Hien, and Walther (2018) mentioned that gold is an important asset in the financial market when there is instability in the economy and considered bitcoin not a good asset to be invested in during that time period. Are there any similarities between gold and bitcoin? And can bitcoin be an alternative asset of gold? These questions are of much importance and in this thesis the characteristics of both would be checked to help both the policy makers and the investors.

The Global Economic Policy Uncertainty (GEPU) has a crucial role to play in the process of making of decisions of the investors, whether they are international or domestic. Researchers believe that there is a negative impact of economic policy uncertainty on the accumulated investment, the rate of employment and also the mass industrial production.

The current Thesis research seeks to understand the impact of gold price, GEPU and oil price on Bitcoin, and the effect of Bitcoin, gold price and oil prices of GEPU. Bitcoin is a very essential asset that has been introduced recently. Its introduction has caused so many major changes in the financial market where other countries and industries have started using it as medium of exchange, rather than for mere speculative reasons. Moreover, little work has been done to understand its impact on global economic policy uncertainty and the effect of GEPU on Bitcoin. Thus, there is need for more work to be done to understand the association between Bitcoin and global economic policy uncertainty for proper policy making. No researches have been done in the past to ascertain the relationship of Bitcoin and global economic policy uncertainty, as per our knowhow, rather studies that has been done used local and regional datasets. As a result, the current research differs from previous researches in 2-fold, hence the originality of the research. Firstly, this research uses global dataset rather than local or regional data whose generalization at an international level is limited. Global data set allows for robust results to be obtained that can be used as a generalization to the rest of the world. Secondly, this research employs two models, the first which seek to ascertain the effect of Bitcoin on GEPU and the second one which ascertains on how global political uncertainty can impact Bitcoin. This research also makes use of the Autoregressive Distributive Lag (ARDL) technique, Quantile regression analysis and the correlation analysis technique. The findings of the study

are provided in chapter 4 and a discussion, conclusion, policy recommendations and recommendations to future studies are given in chapter 5.

Aim of the Research

The purpose of this thesis is to discover if bitcoin has an impact on the world economic policy uncertainty, and if it has a positive or a negative impact? The research to seek to understand the impact of global economic policy uncertainty on Bitcoin. Autoregressive Distributed Lag model of Pesaran, Shin and Smith (1997; 1999; 2001) would be used, together with the Quantile regression analysis, that is strong over heterogeneity. The independent variables used are global gold price and global oil price. In the existing literature many studies have been carried out using different variables for different countries. But the literature lacks studies that have been carried out using global data so far, and since bitcoin is a digital currency and could be used anywhere in the world, at any given time, so it is possible that it would affect the global economy, which is why this thesis would be carried out using global data.

Research Question

The purpose of the research is to answer the following questions:

(1) Does Bitcoin have an impact on the economic policy uncertainty on a global level?
(2) Does GEPU have any significant impact on Bitcoin?
(3) What is the impact of oil and gold prices on global economic policy uncertainty?
(4) What is the effect of oil and gold prices on Bitcoin?

Research Hypothesis

The following sets of hypotheses must be tested to give answers to the research questions:

H_0: Bitcoin has no effect on the GEPU.

H_1: Bitcoin has significant effect on the GEPU.

H_0: GEPU has no effect on the Bitcoin.

H_1: GEPU has significant effect on the Bitcoin.

H_0: Oil and Gold prices have no effect on the Bitcoin.

H_1: Oil and Gold prices have significant effect on the Bitcoin.

H_0: Oil and Gold prices have no effect on the Global GEPU.

H_1: Oil and Gold prices have significant effect on the GEPU.

CHAPTER II

Literature Review

This chapter evaluates the previously done researches on bitcoin and its correlation with other variables in the financial market. Both empirical and theoretical literatures are included in this chapter. Bitcoin has gotten the attention from people all around the world in the past few years. This thesis would discuss the impact of Bitcoin on global policy uncertainty. This new token currency is considered to be risk repellent. Investors consider it to be safe due to its blockchain technology which makes it risk free, since blockchain is very difficult and almost impossible to hack and the records cannot be tempered with. According to Dyhrbery (2016) the importance of Bitcoin in the financial market and as a tool of risk management could not be denied, investors who were otherwise very afraid to take risks and invest have now found it is easy with Bitcoin. In 2017 Bouoiyor and Selmi conducted a study and claimed that the increase in Bitcoin after the 2016 presidential elections in the U.S. indicates that Bitcoin is the new modern tool of safe investment. The Global Economic Policy Uncertainty (GEPU)'s main sources are the energy commodity indices, Bitcoin is viewed as a strong shield against risks that could have an impact on these indices movements according to Bouri, Jalkh, Molnar, and Roubaud, (2017b).

Bitcoin is safe and easy to access, it has the characteristics of an investment alternative according to Chuen, Guo, and Wang (2017). Another study which was conducted in 2014 by Wu and Pandey, where they determined that using bitcoin as an asset could also be very useful, rather than just a substitute for regular currency by the investors. In 2015 Baek and Elbeck claimed in their study that the market of bitcoin is based on speculation and it is very volatile, according to them bitcoin is 26 times more volatile than S&P500 which a stock market index, they used economic variables and bitcoin ratios in order to reach this result. They emphasized on the question whether bitcoin is an asset or a speculative investment, from their findings they have concluded that bitcoin is indeed a speculative vehicle operated by bitcoin buyers and seller. They further added that if more people start using bitcoin the bitcoin volatility would drop. Once the bitcoin volatility is controlled it can attract a more stable market. Bitcoin returns have a higher volatility rate compared to precious metals like Gold and other currencies like US dollar, Dwyer (2015). He further added that bitcoin doesn't require

no central authority to regulate the currency and it could easily be sent and received with the pee-to-peer transaction. If bitcoin takes over as a medium of exchange and if it is used in everyday life then governments would not be able to generate any income from substantial inflation.

Another study was conducted by Yang and Kim in 2015 on Bitcoin volatility, they used a VAR model to investigate the relation between network flow complexity and bitcoin market variable. From their study they found out that the trading network of Bitcoin is notably correlated with return volatility.

The (LASSO) or Least Absolute Shrinkage and Selection Operator model was applied to find out that policy uncertainty is a vital factor of Bitcoin market fluctuations (Panagiotidis et al., 2018). Bitcoin token is indeed an expander when there are EPU shocks (Wang et al., 2019). Some researchers have first identified which factors have an effect on both the GEPU and the level of transformation of blockchain users from normal currency, for instance; Parino et al (2018) used per capita GDP and the freedom volume of trading, both of them are factors that have an impact on GEPU and Bitcoin.

Some researchers have argued that Bitcoin is not as useful for investors because it does not have any ability of risk management. In addition to that, as it is operated on the internet there is a huge risk of Bitcoin being hacked (Yermack 2013). According to Kubat (2015) Bitcoin supply and demand cannot be intervened by the government which means that Bitcoin can help control or maybe even stop inflation, but it is also a fact that we cannot use Bitcoin as a store of value, like US dollar or other currencies, precious metals and indices. Different researchers have chosen different methods to check how well Bitcoin works in the financial market and if it can really be used as another basket for eggs. Financial stress index (FSI) was used to measure the market uncertainty and the price of precious metal gold, which has been used as a store of value for over 5,000 years, the study finds that the token bitcoin is not very useful as a safe haven or store of value by Kristoufek and Scales (2015).

It has also been studied that Bitcoin price is highly sensitive to financial market fluctuations and speculations by investors and market analysts according to the results of Error Correction Mechanism (ECM) estimates carried out by Bartos (2015), who

had used S&P 500 companies, Google, Facebook, Dow Jones and also gold prices. Horra, Fuente & Perote (2019) from their research using monetary theory (GJR-GARCH) model concluded that in the short term, Bitcoin is a speculative asset but the demand of Bitcoin in the long-term is not influenced by speculation, the demand of Bitcoin increases because it is expected to be used as a medium of exchange in the future.

Another study was carried out by Cheah and Fry (2015), who had collected data of Bitcoin prices from the view point of speculations and market bubbles for five years, from July 2010 to July 2014. From their study they concluded that basically Bitcoin prices could substantially lose value over time. Bitcoin is a free currency; it is independent and cannot be regulated by any country or an organization.

Baur, Lee, and Hong (2015) have characterized Bitcoin as a blend of government-issued currency and an artefact that does not have a vital value, which is independent of all regulations. Furthermore, bitcoin does not function like normal assets, it serves the purpose of an asset that is used for speculative asset and not as medium of exchange like money or fiat currency. In accordance with that, Baur, Dimpfl, et al. (2018) conducted a study to find out the relationship between the three main commodities which are gold, bitcoin and the exchange rate of US dollar. The study results appear to present that bitcoin yield tend to appear in an unexpected way over other resources, counting instability and relationship between gold and USD. They also considered the factual characteristics of bitcoin with bonds, shocks and other commodities, and they discovered that bitcoin is unequivocally utilized for theoretical ventures. The study further presents that bitcoin is a resource to a greater extent than money and is not correlated with other resources.

The volatility in crypto market has fascinated the researchers and market experts of present times, to conduct researches and check the correspondence between fiscal markets and the new-fangled crypto market. In 2018 a study was carried out by Corbet, Meegan, Larkin, Lucey, and Yarovaya, they tried to analyse the three most well-known cryptocurrencies with other money related resources from the financial market. Their study concludes that cryptocurrencies are not associated other resources used in the research, which were, indices, gold price and exchange rate, but they are highly linked with each other.

The crypto market has its own risks which are hard to avoid and they can create a huge fall in the value of the individual crypto tokens. They also added that the similarity and the linkage between cryptocurrencies makes the crypto market a new class of possession. Similarly, Brière, Oosterlinck, and Szafarz (2015) using a weekly dataset for the period 2010 - 2013, examined a well-differentiated portfolio using bitcoin as a resource. They discovered an outstandingly low relationship with other conventional resources for example; bonds, currencies. The incorporation of bitcoin in the portfolio upgrades the benefits of diversification and makes strides the investment principle where the potential reward of trading with higher risk escalates.

Bouri, Jalkh, Molnár and Roubaud (2017c) prove that bitcoin has a poor supporting capacity. They also added that bitcoin as it is can be seen as a solid secure sanctuary to maintain a strategic distance from dangers of week-by week-extraordinary drop within the Asian stock showcase. In 2019 Cheng and Yen carried out research to find out the relationship between cryptocurrencies and the EPU index. They tried to see the impact of EPU from different countries on different cryptocurrencies, whether the EPU predicts the returns of well-known crypto currencies. Their study shows that in China the EPU index does predict the bitcoin returns, but the EPU index in other countries like USA, Japan and Korea do not predict that, these countries do not have any policies for bitcoin trading which is why the financial approach vulnerability of these countries cannot anticipate the bitcoin price. But China had introduced new trading policies for bitcoin in September 2017, which improved the predictive ability of EPU for bitcoin returns. This study tends to be a huge help for educationalists and decision maker of the financial markets and states, to regulate the market for crypto-trading and traders who would like to invest in crypto. Maghyereh & Abdoh (2020) used a data set from 2011 till 2019 for S&P500, Bitcoin, US Dollar and Euros exchange rates. They used the Quantile cross-spectral dependence model. They found out that, in the long-run S&P500 and returns on Bitcoin have a right tail dependence. US Dollar – Euro exchange rates and Bitcoin exhibits for a weak dependence return. In the short term, dependence between commodities of silver and oil with Bitcoin decrease most. A unidirectional causality from each and every asset employed to Bitcoin was found as well.

The work by Hu et al. (2019) gives that the financial approach of U.S. gives zero impact on anticipating the bitcoin price. Bradbury (2015) says that the movement in the bitcoin price has a major effect on the people who are involved in the trade of the coin, which is why it can affect the wealth of the state, causing uncertainty. When there was a fall in the exchange rate of the Turkish lira people in Turkey switched to using bitcoin as their main currency to store wealth, this shows how the GEPU could affect the price of the bitcoin cryptocurrency, the research paper also demonstrates that the worldwide financial market faces challenges due to bitcoin and computerized cash, this affects the policy uncertainty. Be that as it may, the fact that the Bitcoin market fluctuation's influence on GEPU is still not very evident (Vigna, 2015). The estimate of bitcoin in relation to other resources is not great (Baur et al., 2018), which too implies it cannot have any effect on the fiscal, money related and financial steadiness. Past researchers have primarily investigated a single directional causal effect from financial circumstance to the market of bitcoin.

Li et al. (2018) examined the bubbles in the bitcoin price in two different countries. The bitcoin bubbles were mostly happening when there were events in the globe which could affect the global financial market. There was a total of five bubbles in the global bitcoin market. The first bubble was a short term one, it started when a trading company in the U.S. stopped using bitcoin as a mean of exchange due to its high price. Then the Chinese financial market started having bubble situations from 2015 till 2017 which had an impact on the bitcoin market and four new bubbles appeared in correspondence to the Chinese market instability. In 2017 the central bank of China banned bitcoin trading which led to a panic situation among the masses who were involved in short term trading, this policy had a great effect on not just the Chinese market but also the American financial market. Speculation about the increase in bitcoin price and internal market shocks of a state are also reasons for the occurrence of a bubbles. Traders invest in bitcoin to gain short terms profits, the collapse of the bubbles in that case could lead to a crisis in the financial market and that would not just affect one country but the whole world. Policy makers should make policies that would discourage and warn the people about such irrational trades. Change in policies or economic instability anywhere in the world has a considerable impact on the bitcoin price, according to Su et al. (2018) the instability and the economic fluctuations brought by the elections in the U.S. and the Brexit event were gradually fading in 2017

and causing a relatively low GEPU because the global economy was becoming more stable. During this period a rise in bitcoin price was experienced.

Some researchers were also interested in checking how secure the bitcoin is? Since there is no governmental body that could protect it, which makes bitcoin an easy target for hackers and cyber pirates. In research from Conti et al., (2018) bitcoin is designed and created in a way that protects the users but cyber pirates try to use these features for stealing. Zaghloul et al., (2020) in their research also talked about the security threats users face every day while buying or selling bitcoin. If the bitcoin wallets are easy to use, they are also easy to be hacked, and the privacy of the users is also not secure. The security problems that bitcoin faces are also the causes of an increase in GEPU.

The security threats that are discussed earlier (Conti et al., 2018; Zaghloul et al., 2020), could discourage the public from investing in the short-term trading of bitcoin and prevent any bubble formation in the market, may raise significant financial and societal issues, leading nations to execute relevant policies. If there are any fluctuations in the bitcoin market there would be a fluctuation in the level of GEPU. The development of a country would be affected if bitcoin is used there illegally in the black market, this would also cause a decline in the GEPU effecting the country's overall economy. Elwell et al., (2013)

Urquhart (2017) looks at the cost of Bitcoin clustering. His discoveries suggest that cost clustering underpins the arrangement theory, which indicates that instability and costs are emphatically related to cost clustering. Upon doing further research using the same method as Urquhart (2017), Mbanga (2018) found out that in the beginning and the end of the week there are irregularities in price clustering, particularly on weekends before the market closes, two-digit decimals were reported. Urquhart (2018) amplifies his own work further by analysing financial specialist consideration and bitcoin basics for the time span of 7 years, from 2010 to 2017 by using a vector autoregression approach and realized volatility. In the discoveries of the research, it appeared that realized instability and exchanging proportions the two of them are partly responsible for the following day costs of bitcoin. In (2017) Nadarajah and Chu conducted more research on Urquhart (2016) pre-existing studies and found out that Bitcoin returns can be proficient in the event that control change is utilized that comes about in no

misfortune of data. Their result demonstrated the change of bitcoin profit has market proficiency.

In (2017) Osterrieder and Lorenz displayed an extraordinary esteem examination of bitcoin profit taking into consideration the G10 monetary standards and the U.S dollar. Based on statistics it appears that in the G10, returns from bitcoin exhibits for higher instability as compared to the G10 monetary forms. Balcilar, Bouri, Gupta, and Roubaud (2017) also conducted research on instability determining the profits earned from the movement in the bitcoin price, to show the behaviour of trade volume, profits, and instability. This research shows that volume can foresee profits but the market structure should either be bullish and bearish. They also added that the volatility of BTC returns cannot be speculated or anticipated by the volume of the trade at any given time.

Katsiampa in the study that was conducted in (2017), mentioned that the volatility of bitcoin is considered to be very important, since it has gained a huge popularity among the investors and grown really fast in the recent days. The research used a GARCH framework to assess the instability of bitcoin trade returns. Bitcoin has unique characteristics which make it ahgdifferent from the other financial market assets, investors try to add it to their portfolio in order to create new opportunities. This study concludes that an autoregressive conditional GARCH model is ideal fit for bitcoin costs since it highlights the usefulness of having both the brief and long-term element of conditional change, this result is helpful for investors and portfolio managers to make rational decisions that would avoid losses and prevent bubble occurrence.

Feng, Wang, and Zhang (2018) in their research collected a data which included the time, date and the price point of bitcoin exchange before any incident that could possibly occur in the bitcoin market. They designed an indicator that was especially useful for the crypto market, to check whether there was any proof of informed exchange or trading of bitcoin prior to both major positive and major negative market events of bitcoin market. Speculators plan their moves ahead of the market events. They trade on Bitcoin two days before any main event that could have a positive impact on the market, in case of any event that might have a potential negative impact on the market they arrange their moves a day before the main day.

Informed trading exists in the bitcoin market, since there is no regulatory body or clear laws that could supervise the cryptocurrency market.

Bariviera, Basgall, Hasperue, and Naiouf (2017) used a data set from 2011 till 2017, they calculated the Hurst exponent by using a Detrended Fluctuation Analysis (DFA) method. From their research they discovered that the volatility in bitcoin is sizeable but it keeps reducing over the period of time. Jiang, Nie, and Ruan (2018) conducted another study to check the long-term inconstant properties of the Bitcoin market. According to their findings the bitcoin market gets ineffective with the passage of time, because the Hurst exponent of their experiment continued to be above 0.5 long memory.

The Economic Policy Uncertainty (EPU)'s prediction power on daily bitcoin trade returns from July 18, 2010 to November 15, 2017 was investigated by Demir, Gozgor, Lau, and Vigne (2018), they discovered that with EPU the bitcoin return could be predicted using the Bayesian Graphical Structural Vector Autoregressive (BGSVAR) model which was originally used by Ahelegbey, Billio, and Casarin (2016) as well as the Ordinary Least Squares (OLS) and Quantile-on-quantile Regression (QQ) estimations. Bitcoin returns are primarily inversely proportional to changes in the EPU. Since the effect is beneficial and comprehensive at the higher quantiles, bitcoin could be used as a hedging mechanism against uncertainty in extreme unpredictable times according to their research.

Shaikh (2020) gives some new information about the correlation between EPU and returns of bitcoin, such as the fact that EPU has no impact on the cryptocurrency market. For EPU, as well as Monetary Policy Uncertainty (MPU), a regression model was created in the research. The analysis covered the time period of eight years, from July 2010, to September 2018, and included Bitcoin's every day and monthly prices and values of EPU. This analysis also takes into account the Federal Open Market Committee (FOMC), GDP and other economic uncertainties on a state level, as well as the behaviour of the bitcoin market. The Markov regime-changing and quantile regression model's robust estimates evidently illustrate that EPU influences the returns of bitcoin and that MPU and GEPU includes information that describes the market dynamics of virtual currencies. The BTC market is adverse for FOMC, GDP and other state level economic data uncertainties. Furthermore, the VIX investor mood index has

an unfavourable impact on the BTC market, on the other hand, the stock returns have no impact on bitcoin trading. Their findings indicate that bitcoin could function as a safe investment and a buffer against uncertainties of the market, and has two non-theoretical consequences. Firstly, policymakers must prioritize and speed blockchain technology development and secondly, bitcoin exchanges require restrictions.

Bouri, Azzi, and Dyhrberg (2017) used a different analytical approach than previous research, they were focusing on bitcoin as a safe investment and how was it related to the fall in bitcoin price in December 2013. The major discoveries, based on an asymmetric-Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model, suggests that bitcoin was indeed a safe investment before it crashed. Their data also shows a negative association between the volatility index of the U.S and the volatility of bitcoin. The safe-haven property, on the other hand, vanishes as there is a downward movement in the price. They also concluded that before the BTC price dropped in 2013, the risk factors were reduced by adding BTC in the U.S equity portfolios.

Wang, Xiea, Wenb, and Zhao (2019) explored the hazard spill over impact from the US's EPU, Equity market uncertainty (EMU) as well as the Volatility index (VIX) files to Bitcoin utilizing two diverse approaches, which are; the Multivariate Quantile Model-Conditional Autoregressive Value at Risk by Regression Quantiles, (MVQM-CAViaR) and the Granger causality risk test. In order to verify whether the decrease in the bitcoin price in December 2013 has any impact on the spill over outcome. They collected a daily and a weekly data set for the whole period, and the sample period was then divided into two sub periods. They also advance examined whether the risk spill over is affected by contemporaneous or instantaneous connections. The results from the empirical research, based on the MVQM-CAViaR approach shows the insignificance effects of the US EPU, EMU and VIX indices on bitcoin, whereas the Granger causality risk test proves that risk spill over impact from the US EPU, EMU and VIX records to bitcoin is inconsequential in most conditions that is distinctive lags and quantiles.

Matkovskyy, Jalan, and Dowling (2019) conducted a comprehensive study analysing the impacts of financial market rules and regulations, economic, fiscal and monetary policies of the US, US, Japan and the other European countries, and their relationship with the bitcoin markets in fiat currencies of the above-mentioned countries, which are the US Dollar, the British Pound (GBP), Euro and the Japanese Yen (JPY) and conventional budgetary markets. In order to conduct this research, they also chose five different stock market indices known as; National Association of Securities Dealers Automated Quotations 100 index (NASDAQ100), Standard and Poor index (S&P500), Euronext100 index, Financial Times Stock Exchange 100 Index (FTSE100) and NIKKEI225 that speak to vital conventional budgetary markets in their particular geographies. They connected multivariate Exponentially Weighted Moving Average (EWMA) framework, Spearman's rho, dynamic copula models (Student-t GAS framework with time-varying conditional cruel and scale parameters). The Diebold and Yilmaz (2012) spill over file and Bayesian vector auto regression (BVAR) models and neighbourhood projection to appraise interdependency among budgetary and bitcoin markets and its response to financial approach stuns. The Diebold et al., (2012) spill over record shows to be expanded and connecting the bitcoin and monetary markets following the dispatch of bitcoin prospects which is reliable with and amplifies the discoveries of the research done by Matkovskyy and Jalan (2019).

A study conducted by Corbet, Larkin, Lucey, Meegan, and Yarovaya (2017) shows that flimsiness spillovers from the U.S. monetary approach declarations to digital currencies with the exclusion of a couple of little cap cryptographic forms of money, they used the Impulse response function in order to carry out this research. Vidal-Tomas and Ibanez (2018) had found that the bitcoin return is not impacted by cash related approach news. Matkovskyy et al., (2019) from their research discovered that interdependency between customary money related markets and bitcoin lessens because of monetary vulnerability shocks. In any case, this study's results clearly demonstrate a noteworthy relationship between EPU and precariousness in the bitcoin markets. Explicitly, they discovered that instability in USA financial arrangements is related with a decrease in instability within the analysed bitcoin market. Moreover, an increment in the instability in the Japanese financial market causes a lessening in instability of the JPY bitcoin showcase. Bitcoin is used as a potential hedging tool in

the British bitcoin market, against the financial instability within the financial market in USA, USA charges, United Kingdom and Japan financial policy.

According to Koutmos (2018) bitcoin is the overarching provider of return and flimsiness spillovers which have risen interdependencies among cryptographic forms of money. Katsiampa et al. (2019) appear to discover proof of bi-directional shock transmission influences between bitcoin and other token currencies such as Ether and Litecoin. Consequently, financial approach stuns through bitcoin can be transmitted to other cryptographic forms of money as well. Tiwari, Jana, Das, and Roubaud (2018) return to the matter of the market effectiveness of the bitcoin market employing a battery of computationally proficient long-range dependence estimators. From their research they have confirmed that the market of bitcoin is quite effective.

Pichl and Kaizoji (2017) examined the bitcoin market characteristics and properties, they tried to investigate the volatility of bitcoin price from different point of views which are the trading volume on different length of time, the logarithmic return and they compared the bitcoin trading with other currency-pair trading for an hour. The connection among bitcoin and trade rates with other major monetary forms was analysed by employing a heterogeneous autoregressive demonstration for realized instability. They considered the instability of bitcoin returns for the past five years. They anticipated day by day returns utilizing counterfeit neural arrangement and other vigorous instruments for determining. From their analysis they concluded that bitcoin price volatility was higher than the other currency exchange rates.

In research carried out by Alvarez-Ramirez, Rodriguez, and Ibarra-Valdez (2018) the bitcoin market proficiency was enlightened. The long-range relationship and imbalance in the bitcoin returns was found by them, and the bitcoin market appeared to be effective, substituting with periods of shortcoming. Blau (2018) examined the cost components and hypothetical trade inside the bitcoin market and finds out that the theoretical trading in 2013 does not add to the peculiar degree of flimsiness in bitcoin trading. Bitcoin price climbed to $1,132.26 at the end of 2013, which was only $13.28 in the beginning of the year, dropping to $315.21 in 2014. From 2013 until 2015 a huge rise in speculative trading was recorded, which added to the volatility of bitcoin. Although they did not find any significant relation in their

univariate or multivariate tests. This study helps in reducing concerns about bitcoin price volatility, and presents it as a currency rather than a speculative investment tool.

Al Mamun, Uddin, Suleman and Kang (2019) investigated the implications of geopolitical risk factor, U.S. and GEPU, and instability of bitcoin and hazard premia on bitcoin relationship with other resources, as well as bitcoin unpredictability. The findings of their research indicated that the most important factor so far that could influence the volatility of the bitcoin returns and risk premia is geopolitical risk. They also show that the influence of the EPU of the U.S. is minor in explaining the bitcoin risk premia, but the GEPU is considerable, also demonstrating that the investors who use bitcoin may only support their portfolio with gold, and not with other monetary resources.

Their discoveries additionally underscore that geopolitical risk, worldwide and US financial strategy vulnerability impacts is a lot more prominent on account of serious monetary circumstances. Bitcoin as it is known has exceptionally special characteristics and it tremendously affects financial backers' portfolio management techniques.

Al Mamun et al. (2019) conducted a study to find out the correlation between bitcoin and GEPU and geopolitical risk. After finding out the close relationship between bitcoin and GEPU and geopolitical risk they recommend to the buyers and sellers that prior to making any investment in bitcoin, financial investors should think about the internal and the external factors, explicitly when conditions are outrageous and the worldwide economy is going through monetary distress. Bitcoin and gold are very closely related in a very negative way, which emphasizes that Bitcoin might not be as safe as gold, which is why it cannot be called a safe haven for investment purposes. But when there are worsening economic conditions the relation between gold and bitcoin is positive and very strong, this implies that during bad economic conditions bitcoin could be used as a safe haven by the portfolio managers particularly because of the reason that it performs just as good as gold. They summed up their study with the point that bitcoin seem to be an appealing asset, notwithstanding lawful, administrative, as well as security worries about bitcoin generation and evaluating process.

Qin, Su and Tao (2021) examined the connection among GEPU and the market of bitcoin to decide if bitcoin might be viewed as another bushel for eggs. They used a causal test of sub-sample to determine the causal link among GEPU and bitcoin price (BP). According to their empirical findings, GEPU is observed to negatively and positively affect BP. Thus to prevent GEPU bitcoin is the best alternative hedge asset or safe haven asset, indicating that it can be considered as a new basket of eggs. However, this viewpoint cannot be retained during periods of negative influence, which they have elaborated in two ways. First, public trust on the bitcoin market might erode due to the security concerns, despite the fact that GEPU is at an all-time high. Afterwards, even if the economic conditions are stable the potential bubbles may then motivate investors to increase their investments. As a result of its volatile nature, bitcoin is not usually utilized to hedge policy uncertainty.

In contrast, BP positively impacts GEPU, indicating that the market of bitcoin is a good tool for better understanding the unpredictability of the global economic policy. The price of bitcoin is also affected by some internal and external variables, internal variables such as security concerns and booms, and external factors are the values of other assets, GEPU and bitcoin price both have mutual effects which is why it is deduced in the study for Bitcoin not to be considered as the best alternative new eggs' basket, because of the reciprocal effect of GEPU and bitcoin volatility, as well as the connection mechanism. Furthermore, when GEPU is taken into account, the impacts of BV and BP can be enhanced. Through GEPU the market of Bitcoin and volatility could be better estimated, this can be beneficial for both the governments and the investors. The investors can better understand the risks of owning Bitcoin. Keeping an eye on the volatility, with an increase in returns investors can use bitcoin as another bushel for eggs, the shares of bitcoin do react to the global economic circumstances which must be considered by the investors before they choose bitcoin as their asset in portfolios.

It is also believed through this study that governments can also use the GEPU and predict the bitcoin market for making better policies in order to prevent possible bubbles and to resolve security issues associated with bitcoin. On the flip side, for some period of time it has been noticed that the rise in Bitcoin price and bitcoin volatility has a positive effect on GEPU which implies that the bitcoin market would

prove to be helpful in examining the global economic environment. In case of a possible boom or even theft in the bitcoin market, the financial departments could increase the confidence of the citizens and sustain the investors' attitude towards the market. In addition to that, the financial sector must also try to reduce the state's economic policy uncertainty resulting from bitcoin market shocks. Portfolios with bitcoin are more risk-adjusted and have higher possibilities of making profits. Bitcoin has a huge potential of becoming an investment alternative. Aggarwal et al., (2018)

Mokni, Ajmi, Bouri and Vo (2021) employed a new strategy, combining the Dynamic conditional correlation (DCC) process created by Engle (2002) with the EGARCH model developed by Glosten et al (1993). The DCC-EGARCH model accommodates for stylized characteristics in financial series such as volatility clustering, deviation, and influence impacts. It also permits conditional correlations to change as the time goes by. The impact of financial coverage uncertainty on the connection among Bitcoin and the United States inventory marketplace is analysed in their study and inferences concerning portfolio allocation and hedging strategies are made. Based on a DCC-EGARCH model, the time-various correlation among the S&P500 and Bitcoin returns underscores proof that Bitcoin is a robust hedge against US inventory marketplace variations.

The evaluation regarding the impact of EPU in consistent and regime-switching fashions indicates that the conditional correlations among bitcoin and the United States stock market, when there is a bitcoin price crash the United States inventory marketplace are notably pushed through EPU very effectively. Bitcoin could be used as a hedging device for the duration of excessive uncertainty; the reason is that the EPU exerts a terrible impact on the conditional correlation. The crash of the bitcoin price has changed the market completely hence the effect of structural change with in the market is different in both periods, i.e., before and after the crash, EPU had a positive impact on the optimal weight before the crash but after the crash the hedging coefficient responded inversely to EPU versions. It would be of great help for the investors to consider EPU before making investment in both the US stock market and Bitcoin market. (Mokni et al., 2020)

Wang, Li, Shen and Zhang (2020) used the software of the EPU application that Baker et al. (2016) had introduced in their study. They used bitcoin as an example for

cryptocurrency, and used the EPU index as a proxy for EPU in both the USA and the UK, to find out the impact of EPU on the crypto currency, i.e., bitcoin. The BTC/GBP and BTC/USD were synthesised primarily based totally on a value-weight to keep away from pattern bias. The consequences display that the returns round the best EPU days are notably more than the ones round the bottom EPU days. In addition to that the EPU in the USA will increase volatility and buying and selling quantity when it's high, however the UK EPU does not, and that spill over results exist for EPU from the US to the UK market. Later the DCC-GARCH model was used which resulted in the DCC being asymmetric, indicating a more potent impact of US EPU on BTC/USD as compared with the impact of the United Kingdom EPU on BTC/GBP. Moreover, the DCC among EPU US and Ret-US is inversely proportional to the value of BTC. According to their study bitcoin could be used as a safe haven in order to steer clear of Economic policy uncertainty (Bouri, et al., 2018).

Jareño, González, López and Ramos (2021) in their research tried to investigate the interrelationship between cryptographic currencies and the oil price shocks during the pandemic. They also wanted to check the volatility of the crypto market in general using eleven cryptographic currencies. The association between oil price and cryptocurrencies is higher in crisis period. During extreme market condition more robust outcomes were realized. Clear contrasts were seen in the effect of changes in the cost of crude oil on the profits of the dissected digital forms of money, as the range of values of the informative power changes relying upon the sub-period examined, which were higher in the COVID-19. Bitcoin showed a direct relation to the demand shocks in the recorded time period.

Su, Qin, Tao, and Zhang (2020) examined the Granger causality among bitcoin price and gold price. The association between these two factors is of importance not just for financial investors to stay away from colossal misfortunes and keep accumulating their wealth by broadening venture risks yet in addition for nations to provoke the steady improvement of their public monetary frameworks by forestalling the huge price fluctuations of bitcoin and gold market. Dwyer, 2015 reports that the volatility in bitcoin price is seen to be higher than the price of gold. The price of bitcoin fluctuates on a greater scale than other currencies and the price of gold, which is why it is not wise to use it as an asset to broaden investment risks (Yermack, 2013). Obryan

(2019) has highlighted that there is an impact from gold price to bitcoin price or the other way around.

Su et al. (2020) claim that the results of their study revealed that sometimes bitcoin is not a threat to gold, these commodities are reciprocal rather than cutthroat competition. The association among bitcoin price and gold price gives disclosures to the investors, who ought to gauge and put resources into bitcoin and gold, which can expand speculation chances and keep them away from losses. Moreover, they can stay away from the critical misfortunes brought about by plunges in the markets of gold and bitcoin. The ramifications for states are that they can get a handle on the patterns of bitcoin price and gold price, to carry out applicable approaches to avoid the enormous fluctuations in costs of gold and bitcoin. Then, they can provoke the steady advancement of the public monetary framework. Besides, the causal connection among bitcoin and the gold price can shift over time. But then there are times when bitcoin is a threat to gold. The increase in bitcoin price causes a decline in the gold price, indicating that the bitcoin market sabotages the hedging capacity of gold. Nonetheless, the decrease in the bitcoin price makes the gold price increment, this means that gold actually can prevent risks, particularly during the bitcoin market decline. They also added that the bitcoin price can be predicted by the price of gold, when the gold price decreases there is a huge increase in bitcoin price which makes bitcoin a new asset that can be added to the portfolio of an investor to prevent risks. Bitcoin market can sometimes be a threat to the gold market but gold remains to be an important asset and the hedging ability of gold remains undeniable.

The present literature does not make it clear for the investors whether they can or cannot use bitcoin as a safe haven for investment or if bitcoin could be used as a new basket for eggs by taking into consideration the GEPU. Moreover, the prevailing researches forgets about the structural adjustments with inside the time collection and the non-strong parameters in the methodologies of the Granger causality technique, which cannot examine the time-sensitive causal association and the existing relations among BP and GEPU.

This section of the thesis reviewed studies by other researchers from around the world using different methodologies and different models, which were very helpful and relevant to our topic. From the summary of the literature, it is evident that the existing literature lacks research that is conducted using global data. This thesis would highlight the importance of bitcoin as a global digital currency that could have an impact on the global economy.

Table 1: Literature Summary

Author	Period	Method	Outcomes
Bouri, et al. (2017)	Before and after 2013 crash	Dynamic Correlation	Bitcoin remains the strongest safe haven and hedge on commodity indices movements.
			The presence of safe haven and hedge ability of Bitcoin on non-energy commodities is inexistence.
			During the pre-crash period the properties of Bitcoin safe haven and hedge properties on energy commodities and commodities are available.
			Bitcoin is a diversifier after the post crash period

Chuen, et al. (2018)	August 11, 2014 – March 17, 2017	Correlation analysis	Returns that exists between traditional assests and cryptocurrencies are low.
		Descriptive statistics	Risk return performance is improved by adding the cryptocurrencies index to the portfolio of traditional assests.
Wu & Pandey (2014)	Daily values	Descriptive statistics	Bitcoin is the widely used and well-known digital currency
		Correlation analysis	Biycoin is less useful as currency it rather plas a role in promoting efficiency of the portfolio of investors
Back & Eldeck (2014)	Daily values	Correlation	The volatility of Bitcoin is driven internally, that is buyer seller driven
			There is more speculation in the market of Bitcoin

Dawyer (2015	July 2010 – December 2014	Descriptive statistics	Inflation rate among nations can be reduced by the widespread use of Bitcoin digital currencies
	Monthly data		Foreign currency exchange is the way in which digital currencies become widespread
Yang & Kim (2015)	From Bitcoin inception – December 31, 2014	VAR	Bitcoin transaction network complexity is correlated with market volatility of Bitcoin
			Bitcoin improves Bitcoin volatility and returns by use of network flow complexity measures
Panagiotidis, et al. (2018)	2010 – 2017	LASSO framework	Gold returns and search intensity are the major drivers towards bitcoin returns
	Daily observations		Uncertainty indices negatively affect returns on bitcoin

			Bitcoin returns are positively impacted by exchange rates
Parino, et al. (2018)	09 January 2009 – 25 February 2016	Correlation and Descriptive statistics	From 2015 to 2017 an increasing trend on yhe country attention is observed to exhibit a rising trend, especially in developing countries
			Bitcoin user adoption, such as, IP addresses and client downloads are correlated with GDP per capita, population, trade freedom, and penetration of internet are significantly correlated from 2012 to 2014
Kubat (2015)	2011 – 2014	Descriptive statistics	Bitcoin volatility or risks are higher in Bitcoin than that of other assets and other currencies
		Qualitative analysis	Bitcoin does not meet the criteria definition of money, inasmuch as, it is considered as money

			Holding bitcoin is more risky than holding other assets
Cheah & Fry (2015)	July 18, 2010 – July 17, 2014	Likelihood ratio tests	Speculative bubbles are exhibited by Bitcoin
		Descriptive statistics	Bitcoin fundamental price is zero
Baur, et al. (2015)	January 2012 – September 2014	Descriptive statistics	Bitcoin is uncorrected with the classes of traditional assets like bonds and stocks
			Bitcoins are used mainly as investment rather than alternative currency
Briere, et al. (2015)	2010 – 2014	Correlation	The investment of bitcoin had high volatility and high average return
			Bitcoin is not strongly correlated with other assets

			Investment in bitcoin gives a significant benefit of diversification
Cheng & Yen (2020)	2014 – 2019	Regression model	Bitcoin monthly returns are predicted by China economic policy uncertainty
			Crypto-trading ban in China impacts Bitcoin returns on the major cryptocurrencies
Umar, et al. (2021)	June 2010 – October 2020	Quantile on quantile based wavelet approach	Bitcoin investment is considered a winner or a safe haven, due to uncertainties
			Bitcoin prices are led by economic and political uncertainties in the US
			Bitcoin is used as hedge against uncertainties among US investors

Urquhart (2017)	May 1, 2012 – April 30, 2017	Regression model	Evidence on clustering at round numbers is significant
			More than 10% of prices ends with 00 decimals
			Returns after the round numbers is not significant
Matkovskyy & Jalan (2019)		Regime switching model	Sttructural breaks and contagion exists in the periods.
			Contagion from markets of finance to markets of Bitcoin is observes, considering both co-skewness and correlation of market returns.
			In crisis periods, risk averse investors shuns Bitcoin which is too risky
Diebold & Yilmaz (2012)	January 1999 –	VAR	Volatility spillovers of cross-market was observed to be limited up until

January 2010		the 2007-2008 global financial crisis
		Volatility spillovers intensified with in line with the rate of crises intensification
		After the demise of the Lehman Brothers spillovers from stock market were spread over to other markets
Want, Singgih, Wang & Rit (2019)	Interviews	Within their own sense making processes, experts have managed to make a development of of different structures of Cognitive.
	14 supply chain experts	
		Sensemaking is one of the most crucial contemporary approach of understanding blockchains
	Cognitive mapping and narrative analysis	Research operations of emerging behavioral are enriched by bringing sense making theory to the field.

Smaniotto & Neto (2022)	2011 – 2018	GMM	Short term bull in the Brazilian Bitcoin is observed with high volatility, uncertainty and market information that is asymmetric
		Correlation	
		Experiments	High speculation in the market was observed due to differences in the return and volatility trajectories
			Speculative trading exists on the Bitcoin market of Brazil is obtained.
Lee, Li & Zheng (2020)		Correlation	Investors are observed to buy/sell bitcoin in the event that the price fall/rise above the prospective value
		Markov switching	
			In the high volatility market regime
		Forecasting	, speculators tend to adopt the momentum trading strategy and in the low velocity market they follows a contrarian strategy

			Bitcoin is valued by tech-savvy investors as an innovative technology
Corbet, Katsiqmpa & Lau (2020)	August 7, 2015 – January 20, 2019	Granger causality	A significant two-way directional causal link between Bitcoin and all assets and altcoins specified in this research is found
			During extreme conditions, Bitcoin price returns forecast is obtained through assets and although conditioning
			During normal conditions, returns on Bitcoin price depends on the quantile and altcoin under consideration
			Bitcoin is considered an oil safe haven and as a financial asset it is not isolated from the market
			Bitcoin is weak safe haven for S&P500, but taking into

			consideration gold, it is neither stone nor weak
Horra, Fuente & Perote (2019)	August 17, 2010 – February 28, 2018	Monetary theory GJR-GARCH	In the short term, Bitcoin is more of a speculative asset Bitcoin demand in the long-term is not influenced by speculation The future expectation of Bitcoin on its utility as medium of exchange drives demand
Maghyereh & Abdoh (2020)	2011 – 2019	Quantile cross-spectral dependence	In the long-run S&P500 and returns on Bitcoin have a right tail dependence US Dollar – Euro exchange rates and Bitcoin exhibits for a weak dependence return

			In the short term, dependence between commodities of silver and oil with Bitcoin decrease most
			A unidirectional causality from each and every asset employed to Bitcoin is found
Su, et al. (2020)	2010 June – June 2019	Granger causality test	Sometimes Bitcoin is not a threat to gold
		Descriptive statistics	Gold and Bitcoin are rather reciprocal than cutthroat competitors
			The association among bitcoin price and gold price gives disclosures to the investors, who ought to gauge and put resources into bitcoin and gold, which can expand speculation chances and keep them away from losses.
			Moreover, they can stay away from the critical misfortunes brought

about by plunges in the bitcoin or gold market.

The ramifications for states are that they can get a handle on the patterns of bitcoin price and gold price, to carry out applicable approaches to avoid the enormous fluctuations in bitcoin and gold costs.

Then, they can provoke the steady advancement of the public monetary framework.

Besides, the causal connection among bitcoin and the gold price can shift over time.

But then there are times when bitcoin is a threat to gold, this was seen after applying the bootstrap subsample rolling-window causality test.

The increase in bitcoin price causes a decline in the gold price,

indicating that the bitcoin market sabotages the hedging capacity of gold.

Nonetheless, the decrease in the bitcoin price makes the gold price increment, this means that gold actually can prevent risks, particularly during the bitcoin market decline.

They also added that the price of bitcoin can be predicted by the price of gold, when the gold price decreases there is a huge increase in bitcoin price which makes bitcoin a new asset that can be added to the portfolio of an investor to prevent risks.

Bitcoin market can sometimes be a threat to the gold market but gold remains to be an important asset and the hedging ability of gold remains undeniable

Obryan (2019)	January 2013 to May 2017	Structural time series models	There is an impact from gold price to bitcoin price or the other way around.
			The association between Bitcoin with the exchange rate of the Yuan and USD and the price of gold is a negative one
			The relationship between Bitcoin with the exchange rate of USD to Euro, the stock market index is a significant positive one.
			Botcoin and search trends of various countries shows variations in signs.
			Bitcoin is observed to have many different characteristics, which includes that of being a safe haven, a speculative instrument and as a capital
Yermack, (2013		Qualitative	The price of bitcoin fluctuates on a greater scale than other currencies

and the price of gold, which is why it is not wise to use it as an asset to broaden investment risks

No correlations exists between Bitcoin with gold and Common currencies

Thus, Botcoin cannot be used fornthe purposes of risk management

Owners of Bitcoin cannot hedge

Prices of Botcoin take into consideration for many decimal places which leads to zeros

Daily hacking is faced by hacking as well as thft risks

Bitcoin tends to lack banking system that has deposit insurance, hence can't qualify to be used for

			loan contracts and credit to consumers
			Rather than a currency, Bitcoin behave as a speculative asset
Jareño, et al., (2021)	November 20, 2018 - June 30, 2020	NARDL	The association between oil price and cryptocurrencies is higher in crisis period.
			During extreme market condition more robust outcomes were realized. Clear contrasts were seen in the effect of changes in the cost of crude oil on the profits of the dissected digital forms of money, as the range of values of the informative power changes relying upon the sub-period examined, which were higher in the COVID-19.
			Bitcoin showed a direct relation to the demand shocks in the recorded time period.
Bouri et al. (2018b)	July 18, 2010 -	Copula-primarily	The global financial stress index (GFSI), which associated with

December 29, 2017	based totally method	GEPU, is strongly Granger purpose BP.
		bitcoin could be used as a safe haven in order to steer clear of Economic policy uncertainty.
July 19, 2010 - October 31, 2017	VAR GARCH-in-mean model	The postulations of the studies shows that the market of Bitcoin is not isolated to other financial assets markets
		Bitcoin market is related to markets of other commodities markets
		The volatility received by Bitcoin is more than the volatility it transmits
		The two market conditions have different spillovers

			Bitcoin is being considered as an alternative investment by managers and investors
Wang, et al. (2020)	September 13, 2011 - December 31, 2018.	DCC-GARCH model	The consequences display that the returns round the best EPU days are notably more than the ones round the bottom EPU days.
		Software of the EPU application that Baker et al. (2016)	In addition to that the EPU in the USA will increase volatility and buying and selling quantity when it's high, however the UK EPU does not, and that spill over results exist for EPU from the US to the UK market.
Mokni, et al. (2021)		DCC-EGARCH model	The time-various correlation among the S&P500 and Bitcoin returns underscores proof that Bitcoin is a robust hedge against US inventory marketplace variations.
			The evaluation regarding the impact of EPU in consistent and regime-switching fashions indicates that the

conditional correlations among bitcoin and the United States stock market, when there is a bitcoin price crash the United States inventory marketplace are notably pushed through EPU very effectively.

Bitcoin could be used as a hedging device for the duration of excessive uncertainty; the reason is that the EPU exerts a terrible impact on the conditional correlation.

The crash of the bitcoin price has changed the market completely hence the effect of structural change with in the market is different in both periods, i.e., before and after the crash, EPU had a positive impact on the optimal weight before the crash but after the crash the hedging coefficient responded inversely to EPU versions.

It would be of great help for the investors to consider EPU before making investment in both the US stock market and Bitcoin market

Qin, Su and Tao (2021)	July 2010 - June 2019	Granger causality tests	GEPU has both beneficial and adverse effects on BP. The beneficial effects suggest that bitcoin may be used as a hedge or safe haven to prevent GEPU, indicating that bitcoin is a new egg basket.
			This viewpoint, however, cannot be retained during periods of negative influence, which they have elaborated in two ways.
			First, public trust on the bitcoin market might erode due to the security concerns, despite the fact that GEPU is at an all-time high. Afterwards, even if the economic conditions are stable the potential bubbles may then motivate investors to increase their investments.
			As a result of its volatile nature, bitcoin is not usually utilized to hedge policy uncertainty.

BP has a positive effect on GEPU, indicating that the market of bitcoin is a good tool for better understanding the unpredictability of the global economic policy.

The price of bitcoin is also affected by some internal and external variables, internal variables such as security concerns and booms, and external factors are the values of other assets, GEPU and bitcoin price both have mutual effects which is why it is deduced in the study that Bitcoin must not always be considered as a new basket for eggs., because of the reciprocal effect of GEPU and bitcoin volatility, as well as the connection mechanism.

Furthermore, when GEPU is taken into account, the predictive effects of BP and BV can be improved.

Through GEPU the Bitcoin market and volatility could be better

estimated, this can be beneficial for both the governments and the investors.

The investors can better understand the risks of owning Bitcoin.

Keeping an eye on the volatility, with an increase in returns investors can use bitcoin as another bushel for eggs, the shares of bitcoin do react to the global economic circumstances which must be considered by the investors before they choose bitcoin as their asset in portfolios.

Al Mamun et al. (2019	July 18, 2010 - October 30, 2016	DCC-GJR-GARCH mod	The most important factor so far that could influence the volatility of the bitcoin returns and risk premia is geopolitical risk. They also show that the influence of the economic policy uncertainty of the U.S. is minor in explaining the bitcoin risk premia, but the global economic policy uncertainty is considerable, also demonstrating that the investors who use bitcoin may only support their portfolio with gold, and not with other monetary resources.

The effect of geopolitical risk, worldwide and US financial strategy vulnerability is a lot more prominent on account of serious monetary circumstances. Bitcoin as it is known has exceptionally special characteristics and it tremendously affects financial backers' portfolio management techniques.

After finding out the close relationship between bitcoin and geopolitical risk and global policy uncertainty they recommend to the buyers and sellers that prior to making any investment in bitcoin, financial investors should think about the internal and the external factors, explicitly when conditions are outrageous and the worldwide economy is going through monetary destress. Bitcoin and gold are very closely related in a very negative way, which emphasizes that Bitcoin might not be as safe as gold, which is why it cannot be called a safe haven for investment purposes.

But when there are worsening economic conditions the relation

			between gold and bitcoin is positive and very strong, this implies that during bad economic conditions bitcoin could be used as a safe haven by the portfolio managers particularly because of the reason that it performs just as good as gold.
			They summed up their study with the point that bitcoin is an appealing investment, notwithstanding lawful, administrative, and security worries about the bitcoin generation and evaluating process.
Pichl and Kaizoji (2017)		HARRVJ model	Bitcoin price volatility was higher than the other currency exchange rates
Alvarez-Ramirez, et al. (2018	30 June, 2013 - 3 June, 2017	Detrended fluctuation analysis	The long-range relationship and imbalance in the bitcoin returns was found by them, and the bitcoin market appeared to be effective, substituting with periods of shortcoming
Blau (2018)	17 July, 2010 - 1 June, 2014	GARCH	The theoretical trading in 2013 does not add to the peculiar degree of flimsiness in bitcoin trading

Bitcoin price climbed to $1,132.26 at the end of 2013, which was only $13.28 in the beginning of the year, dropping to $315.21 in 2014.

From 2013 until 2015 a huge rise in speculative trading was recorded, which added to the volatility of bitcoin.

Although they did not find any significant relation in their univariate or multivariate tests. This study helps in reducing concerns about bitcoin price volatility, and presents it as a currency rather than a speculative investment tool.

CHAPTER III

Methodology

The methodological approach of this thesis is explained in this section. Secondary data was used to carry out this quantitative study, which was collected from multiple resources, and later processed, analysed and explained. The data description, model specification and methods used will be included in this section.

Variable description and Data resources

This analysis employs Bitcoin prices as the crypto currency used in this research as a dependent variable of the 1st model and explanatory indicator in the second model, obtained from Investing.com. Global Economic Policy Uncertainty (GEPU) is modelled as the dependent variable in the 2nd model and explanatory indicator in the 1st model. The independent variables include: Crude Oil prices, gold prices. The data for Crude Oil and Gold prices is obtained from FRED data centre, the GEPU observations are retrieved from https://www.policyuncertainty.com/. The data span is monthly frequencies from January 2011 until May 2021. The variables were converted into real terms excluding GEPU which was available for PPP adjusted. All the variables are global values.

Table 2: Variable description and Data resources

Variable	Type		Description
Bitcoin (BTC)	Dependent / Independent	/	Monthly values of global crypto currency Bitcoin price in US dollars
Global Economic Policy Uncertainty (GEPU)	Dependent / Independent	/	Monthly values of Global economic policy uncertainty.
Gold	Independent		Monthly values of global gold price in US dollars
Oil	Independent		Month values of global oil price in US dollars

Model description

In order to understand the effect of Bitcoin on GEPU, as well as understanding the impact of GEPU on Bitcoin, this study uses two models. The first model is the one where GEPU is the dependent variable and the other model is where Bitcoin is the dependent variable. By ascertaining GEPU as the dependent variable, this allows us to very on how Bitcoin and other explanatory variables such as gold and oil prices can impact GEPU. In the same lines, the impact presented on Bitcoin by GEPU can also be examined by employing Bitcoin is the dependent variable and GEPU as the independent variable, together with other regressors such as gold and oil prices. Therefore, in the first model we present GEPU as a function of Bitcoin, gold and oil prices. This relationship can be expressed through the mathematical representation is below:

$$GEPU = f(BTC, GOLD, OIL) \qquad (1)$$

Where GEPU is the GEPU and it is the dependent variable, BTC is the Bitcoin and is expressed as the independent variable, whereas gold is the value of gold and oil is the value of oil and these two variables are presented as the independent variables.

In the same lines with the mathematical representation presented above, the second model has Bitcoin as the dependent variable whereas global economic policy uncertainty is the independent variable together with other independent variable such as gold and oil prices. The second model is provided for in Equation 2 below:

$$BTC = f(GEPU, GOLD, OIL) \qquad (2)$$

BTC represents Bitcoin, GEPU represents global economic policy uncertainty, whereas gold is the value of gold and oil is the oil value in the world, according to the data used in this research.

Methods used for Data analysis

The Unit Root Test

Unit root test is a very crucial pre-testing method used in data analysis. This is so because time series data with longer time frames have been observed to suffer from problems of spurious regressions. Models such as the Ordinary Least Squares (OLS) requires all the indicators employed in a study to be stationary, otherwise spurious regressions may occur. When spurious regressions occur in a model, this means that the findings of the study become unreliable, not robust and cannot be trusted for policy implications. Other models such as the cointegration regressions the "Dynamic Ordinary Least Squares" (DOLS) as well as the "Fully Modified Ordinary Least Squares" (FMOLS)) requires all the variables in a model specification to be non-stationary at level but stationary at first difference. This means that the DOLS and FMOLS models require all the indicators in a model specification to be integrated of order. Moreover, other models like the Autoregressive Distributive lag (ARDL) technique need all the indicators in a model specification to be either integrated of order 0 or integrated of order 1. Thus, the ARDL model works with indicators that are integrated of a mixture of order 0 and order 1 without no variables integrated of order 2 and more.

Up to this point, we have realized that different models requires different Unit root conditions to be met, where the ARDL needs both order 0 and order 1 of integration, the OLS needs all variables to be stationary and the DOLS and FMOLS techniques requires all indicators to be I(1). Due, to this reason the unit root test is undoubtedly the most crucial pre-testing technique, before one proceeds to applying any method in data analysis. There are various methods of unit root test that are used in the field of research, however the Augmented Dickey Fuller (ADF) technique together with the Philips Peron (PP) tests are the traditional ones and the widely used methods of unit root test (Dickey & Fuller, 1979; Philips & Peron, 1988). In this research Thesis, we therefore make use of the ADF and the PP techniques of testing unit root for the purpose of understanding the order of integration for each indicator in the model specification, which will help us to understand the best model to be used.

Autoregressive Distributed Lag (ARDL)

Because of the characteristics observed in the indicators provided for in the model specification of this research, after having done the pre-tests of unit root, we observe that the ARDL technique is the best method to use. This is so because, the model's indicators are integrated of order 1 and of order 0. The ARDL provides for the short-run coefficients as well as the long-run coefficients of the model. It was first developed by Pesaran, et al. (1997). The ARDL model was pioneered due to the short comings of the long-run cointegration models like the DOLS, Vector Error Correction (VEC), and the FMOLS models, which required all the indicators to be integrated of order 1 and to be cointegrated. Thus, the ARDL model was developed for the purpose of overcoming this shortfall thereby providing a wide variety of methodologies that can work under various conditions. The ARDL, thus shifted a bit from the conditions of the long-run cointegration regressions by allowing for indicators with mixed order of integration to be analyzed. The data generating process in a general-to-specific modelling framework requires sufficient number of lags in ARDL model Shrestha & Bhatta (2018). The ARDL model was later modified by Pesaran, et al. (1999) and finally by Pesaran, et al. (2001).

Pesaran, et al. (2001) developed the bounds technique of the ARDL technique, which tests for the availability of levels association among variables expressed in an ARDL model. The levels relationship of the bounds test technique helps to understand the existence of a long-run association among variables. The null hypothesis of the bounds test technique states that the indicators specified in an ARDL model does not have levels relationship, that is they are not cointegrated, while alternative hypothesis states that the indicators in a model have significant levels relationship, that is, they are cointegrated. The bounds test technique uses the use bounds (I(1)) and the lower bounds (I(0)) in ascertaining the presence of a longer-term association among the indicators. The null hypothesis is accepted if the F-statistics or the t-Statistic values are smaller than both the upper as well as the lower bounds. The alternative hypothesis is accepted if the F-statistic as well as the t-statistics values are bigger than the upper and the lower bounds. Thus, the presence of a longer-term cointegration association is declared when the values of the t-Statistic and that of the F-statistics are bigger than the lower and the upper bounds in a bounds technique ARDL. The bounds technique

of ARDL is crucial for the purpose of ascertaining on whether to specify the long-run "Error Correction Model" (ECM) of the ARDL technique. Thus, if no levels relationship exists, then the long-run ARDL technique will not be specified, rather the short-model is only applied, whereas is levels relationships exists then both short-term and long-term models of ARDL are specified. In ARDL model a dynamic error correction model (ECM) is derived through a simple linear qualitative change. The ECM avoids problems like spurious relationship which could result from non-stationary time series data set. ECM is proved to be efficient in integrating short-run dynamics with the long-term equilibrium without losing any long-term information. The model statistical specifications are given in Equations 3 and 4 that is, for the short-run ARDL and in Equations 5 and 6, for the long-run ARDL and ECM technique.

Short-run ARDL specifications

$$\Delta GEPU_t = c_0 + \sum_{i=1}^{p} c_{1i} GEPU_{t-i} + \sum_{i=0}^{q} c_{2i} BTC_{t-i} + \sum_{i=0}^{q} c_{3i} GOLD_{t-i}$$
$$+ \sum_{i=0}^{q} c_{4i} OIL_{t-i+u_t} \qquad (3)$$

$$\Delta BTC_t = c_0 + \sum_{i=1}^{p} c_{1i} GEPU_{t-i} + \sum_{i=0}^{q} c_{2i} BTC_{t-i} + \sum_{i=0}^{q} c_{3i} GOLD_{t-i}$$
$$+ \sum_{i=0}^{q} c_{4i} OIL_{t-i+u_t} \qquad (4)$$

Long-run ARDL specifications

$$\Delta GEPU_t = c_0 + \sum_{i=1}^{p} c_{1i}\Delta GEPU_{t-i} + \sum_{i=0}^{q} c_{2i}\Delta BTC_{t-i} + \sum_{i=0}^{q} c_{3i}\Delta GOLD_{t-i}$$

$$+ \sum_{i=0}^{q} c_{4i}\Delta OIL_{t-i+\ c_5 ECT_{t-1}} + u_t \qquad (5)$$

$$\Delta BTC_t = c_0 + \sum_{i=1}^{p} c_{1i}\Delta GEPU_{t-i} + \sum_{i=0}^{q} c_{2i}\Delta BTC_{t-i} + \sum_{i=0}^{q} c_{3i}\Delta GOLD_{t-i}$$

$$+ \sum_{i=0}^{q} c_{4i}\Delta OIL_{t-i+\ c_5 ECT_{t-1}} + u_t \qquad (6)$$

In the Equations 3 to 6, GEPU represents global economic policy uncertainty, BTC represents Bitcoin, GOLD represents the gold prices, while OIL represents the global priced of oil. In the Equations 3 to 6, Δ is the operator of first difference in ARDL technique. c_0 is the constant term in all Equations, whilst c_1 to c_4 are the coefficient parameters of the independent variables in the models, respectively, **ut** stand for the white noise error term, while c_5 is the coefficient parameter of the error correction term in the long-run specifications. In the Equations 5 and 6 of the long-run ARDL, **ECT** stands for the model's "error correction term". The **ECT** value in a long-run is used to understand the presence of a longer-term association and adjustment of adjustment to a long-term equilibrium. It follows that, the existence of a long-run association is ascertained when the p-value of the ECT is significant and when its coefficient is negative. The coefficient value is also considered as the adjustment rate and if it is less than 0.5, then speed if adjustment is low, if it is more than 0.5 but less than 1, then the spread of adjustment is high while if it is more than 1 then it will overshoot towards a long-run equilibrium.

Quantile Regression Analysis

The current Thesis on top of using the ARDL model, it also employs the Quantile regression analysis for the purpose of checking the robustness of the short-run ARDL model. The Quantile regression analysis is an extension of the traditional Ordinary Least Squares model. It was developed due to the short comings of the OLS model (normality problems, heteroskedasticity problems, among many others). Therefore, the Quantile regression analysis is a special type of the OLS model that is strong over normality problems and heterogeneity. The Quantile regression analysis makes it possible for the researchers to understand the general behaviour of the regressor variables towards the dependent variables across all the quantiles, that is, from quantile one up to the 9th quantile.

In the Quantile Regression analysis, the first three quantiles are referred to as the lower quantiles, following three quantiles are the middle quantiles in the model and the last three quantiles are the upper quantiles. As a result, by grouping different quantiles of the model into various sub-groups this gives more room to the researcher to easily evaluate the relationship that exists among variables I different quantiles, hence policy implications are drawn. It must also be noted that the quantile regression analysis is a reliable model that gives valid results because of its character of being strong over heterogeneity and normality problems. In the Equations 7 and 8 below we provide the model specifications of the quantile regression analysis for the two models employed in this research study, that is the one where GEPU is the dependent variable and the other one where Bitcoin is the dependent variable.

$$GEPU_t = c_0 + c_1 BTC_{t-i} + c_2 GOLD_{t-i} + c_3 OIL_{t-i} + ut \qquad (7)$$

$$BTC_t = c_0 + c_1 GEPU_{t-i} + c_2 GOLD_{t-i} + c_3 OIL_{t-i} + ut \qquad (8)$$

Descriptive Statistics

The statistical characteristics and quantitative summary of the data used are described here. There are two ways that could be employed for the statistical description of the data, the central tendency such as mean and median and the variability measurements such as kurtosis, skewness, Jarque-bera, minimum and maximum. The mean of data is the average value, and the median is the middle value of the arranged data. The degree of variation of the data from its mean is called the standard deviation; it could either be low which means that the values are closed to the mean or high, meaning that the data is far away from the mean value.

In statistics, kurtosis test measures the "tailedness" of the probability distribution of a real-valued random variable. Higher kurtosis data sets mean greater extremity of deviation and not the arrangement of data near the mean value. The skewness test is the curvature or asymmetry that diverges from the symmetrical bell curve in a set of data. The shape of the curve is either shifted to the left or to the right and this shifting is the skewness. The Jarque-bera test measures the normality of the data set. It tells if the data is normally distributed or not. It measures the goodness-of-fit in large data sets.

Correlation Analysis

Most past studies on the relationship between Bitcoin and other financial assets and/or foreign exchange rate have widely used the correlation analysis (see, Bouri, et al., 2017; Chuen, et al., 2018; Wu & Pandey, 2014; Back & Eldeck, 2014; Parino, et al., 2018; Briere, et al., 2015; Smaniotto & Neto, 2022). The correlation analysis technique is used to understand the relationship amongst a pair of two variables. It helps to understand if a pair of two variables are related or not. Unlike the regression analysis which seek to understand the existence of a linear relationship among the dependent variable on one side with the explanatory variables on the other side, as well as ascertaining the effect of the independent series on the explanatory indicator the correlation analysis does not examine the existence of a linear relationship nor does it seek to understand the impact of one variable on another. Under the correlation

analysis, there is no dependent nor independent variables. This is so because the correlation analysis measures the degree of relationship that exists among two variables. It shows on whether the correlation association is a weak or strong positive or negative one. It follows that, if the correlation value is less than 50% then it is a weak correlation and if the correlation value is greater than 50%, then it is a string correlation. Moreover, if the correlation value is negative value, then there is a negative association amongst the variables, such that a rise in a series is accompanied by a fall in another. If correlation value is a positive one, then the correlation is a positive one showing that, a rise in one indicator is followed by a rise in the other.

CHAPTER IV

Data Analysis and Findings

This chapter includes the empirical findings of the research. The detailed estimation of the data using different tools, finding the results and then interpreting them would be done.

Descriptive Statistics

Table 3:

Descriptive Statistics

	BTC	GEPU	GOLD	OIL
Mean	0.792211	5.134886	1.756320	-1.331845
Median	0.920913	5.087929	1.704861	-1.434634
Maximum	5.365416	6.080047	2.061559	-0.711217
Minimum	-6.435101	4.443228	1.502573	-2.739541
Std. Dev.	2.808575	0.377898	0.153986	0.400391
Skewness	-0.571898	0.370979	0.456096	-0.285786
Kurtosis	2.443583	2.278853	1.836840	2.753103
Jarque-Bera	8.426398	5.575801	11.38039	2.019027
Probability	**0.014799**	**0.061550**	**0.003379**	**0.364396**

The descriptive statistics are reported in table 2. The mean of all the variables BTC, GEPU, Gold and Oil are centred at 0.792211, 5.134886, 1.756320 and -1.331845 respectively, whereas the median values are 0.920913, 5.087929, 1.704861 and -1.434634 respectively.

In GEPU and gold, a positive skewness is observed and negative in BTC and Oil prices, indicating the GEPU and Gold are right-skewed and BTC and Oil prices are left-skewed. The kurtosis is less than 3, the data is said to be platykurtic, although this does not imply that the distributions are "flat-topped", it means the distributions produce fewer and less extreme outliers than does the normal distribution.

In addition to that, the Jarque-Bera givess that GEPU, BTC and Oil prices are not distributed normally at a 1%. As the non-normal pattern is mainly observed in the oil price and roughly in GEPU (at 5% level), this can justify using QARDL. Hence, it is safe to say that the relations among the variables under examination are hard to be linear.

Correlation

This section gives the findings of the correlation analysis. This thesis study shows in Table 4 that, all the variables utilized in this research study are significantly correlated. GEPU and BTC, GEPU and GOLD, GOLD and OIL are observed to exhibits for a positive significant correction amongst each other. The positive and significant correlation shows that when one indicator rises then the other indicator will also rise in the same direction and vice-versa. Therefore, they are said to be moving in the same direction. GEPU and OIL, BTC and GOLD, BTC and OIL are observed to exhibits for a significant negative correlation amongst one another. The negative significant correlation shows that, if one indicator rises then the other will fall and vice-versa. Therefore, a negative significant correlation shows the existence of opposing forces, moving in the different direction, amongst the variables.

Table 4:

Outcomes of correlation analysis

Correlation t-Statistic Probability	GEPU	BTC	GOLD	OIL
GEPU	1			
BTC	0.521700 6.782008***	1		
GOLD	0.215338 2.445590**	-0.388302 -4.673172***	1	
OIL	-0.584655 -7.992463***	-0.651820 -9.532285***	0.316873 3.705233***	1

***; **; *; shows 1%; 5%; 10% level of significant, respectively

One of the most crucial analyses to be done after having employed the correlation analysis, is to determine if the variables, whether positively or negatively correlated, are strongly correlated or weakly correlated. Thus, the magnitude or the degree of the relationship is very crucial and this can be done by checking the correlation coefficient. It follows that, if the correlation coefficient is greater than 0.5 and close to 1 then the variables in question are strongly correlated. If the correlation coefficient is less than 0.5 and close to 0, then the variables in question are weakly correlated.

The outcomes provided in Table 4 indicates that, GEPU and oil prices have a strong positive correlation. This is so because their correlation value is 0.52 which is

greater than 0.5. Therefore, in this case we provide that when GEPU increases then oil prices will also increase in the same direction. Also, if GEPU decreases then the oil prices will also decrease in the same manner. We also provide that if oil prices increase or decreases GEPU will also increase or decrease in the same manner. Therefore, it is very paramount to know the association existing among GEPU and oil prices. These two indicators are observed by the correlation analysis that they move in the same direction, thus in order to reduce oil prices they should fight towards reducing the GEPU and if the global economy also wants to reduce global economic policy uncertainty, they can also work towards reducing the prices of oil.

The outcomes provided for in Table 4 also shows that GEPU indicator and gold prices indicators have a weak positive correlation. The relationship between these two indicators is weak because their correlation value is 0.215 which is less than 0.5. Therefore, this thesis provides the association that exists between these two variables of GEPU and gold prices, that it is not a strong one rather it is a weak association such that the impact of one variable towards another is not very high. Again, we provide that when GEPU increases or decreases gold prices would also tend to increase or decrease and if gold prices increase or decreases GEPU will also increase or decrease in the same manner, due to the existence of a positive correlation between the two indicators.

This thesis also provides that the correlation association that exists between gold prices and oil prices is a week positive correlation. This is so because their correlation value is 0.317 which is less than 0.5 indicating that when one variable increase or decreases another will not increase or decrease in a large margin. The significant positive correlation between gold prices and oil prices indicates that when gold prices increase or decreases, oil prices will also tend to increase or decrease and if oil prices increase or decrease. Therefore, these findings are very crucial because they indicate that low oil prices tend to also reduce and stabilise the prices of gold and vice versa.

Moreover, the findings provided for in Table 4 also shows that GEPU and oil prices have a strong significant negative correlation. This is so because their correlation value is negative 0.58 which is greater than 0.5 indicating that the correlation that exists between the two is strong association. Therefore, if global

economic policy uncertainty increases or decreases then oil prices will tend to decrease or increase respectively and if oil prices increase or decreases, global economic policy uncertainty would also tend to decrease or increase respectively. Therefore, we observe that these two variables act in opposite directions such that a rise in one variable also tend to lead to a fall in another variable and vice versa.

The findings in Table4also shows that Bitcoin and gold prices exhibits for a weak negative correlation. This is so because their correlation value is negative 0.388 which is less than 0.5, indicating that the correlation association is a weak one. Likewise, an increase in Bitcoin tends to cause a decrease in gold prices and an increase in gold prices tends to lead to a fall in Bitcoin and vice versa. However, the association ship is not very strong, it is a weak one, indicating that the impact on one another is not very high. Bitcoin is also observed in Table 4 to have a significant negative strong correlation with oil prices because their correlation value is negative 0.65 which is higher than 0.5. Therefore, if Bitcoin increases then oil prices will tend to decrease and vice versa or if oil prices increases then Bitcoin will also tend to decrease and vice versa. The relationship between these two variables is a strong correlation indicating that the impact on one another is very high.

Unit Root Test

This section of the thesis shows the outcomes of the ADF and PP tests of unit root. The test of unit root is very crucial in this case considering the type of methods that is employed in this study. The autoregressive distributive lag model is a type of data analysis technique that requires all the indicators that are employed in a research study to be integrated of either order one or order 0. Therefore, it is very crucial to understand and analyse and see the order of integration of all the indicators that are employed in a research study before using the ARDL model. This study uses the PP and the ADF tests of unit root to verify the order of integration of all the variables under study. The Table 5 of this research study gives the outcomes of the unit root test at both level and at first difference considering the two tests that has been employed.

In Table 5 it is observed that GEPU, according to the findings of the ADF test of unit root, is stationary at level at 5% level of significance and it is also stationary at first difference at 1% level of significance. Therefore, according to the findings of the ADF test global economic policy uncertainty indicator is integrated of order 0. The findings of PP test also provides that at level global economic policy uncertainty is stationary at level at 5% level of significance and that it is also stationary at first difference, at 1% level of significance. Therefore, this research study shows that global economic policy uncertainty according to both the ADF and the PP test of unity route is integrated of order 0.

The outcomes of unit root in Table 5 also shows that Bitcoin according to the ADF test is not stationary at level. This means that Bitcoin indicator is not integrated of zero order according to the ADF unit root test. However, at first difference Bitcoin indicator is found that its stationary at 1% significant level. Thus, in this research thesis, we show that Bitcoin indicator as per the test of ADF is integrated of order one. The outcomes of PP test of unit root also shows that Bitcoin at level is not stationary, rather it is stationary at 1st difference at 1% level and in line with the prior postulations this research thesis shows that according to PP test of unit root Bitcoin is integrated of order one. Therefore, both the ADF and the PP test of unit root concurs that Bitcoin is integrated of order one.

Table 5:

ADF and PP unit root test outcomes

| | *ADF* | | *PP* | | |
	Level	*First Difference*	*Level*	*First Difference*	*Integration order*
GEPU	-3.994	-13.905	-3.812	-16.506	
	(0.011)	(0.000)	(0.019)	(0.000)	*I(0)*
BTC	-3.105	-7.494	-3.103	-7.094	
	(0.109)	(0.000)	(0.110)	(0.000)	*I(1)*
GOLD	-1.174	-8.467	-0.729	-8.321	
	(0.911)	(0.000)	(0.968)	(0.000)	*I(1)*

OIL	-3.342	-8.758	-2.461	-9.318	
	(0.064)	(0.000)	(0.347)	(0.000)	*I(1)*

The findings of the unit root test according to ADF test in Table 5 also shows that gold price indicator at level is not stationary, but rather it is stationary at 1st difference at 1%. Therefore, these outcomes of the unit root test of ADF, shows that gold price is not integrated of order 0, but rather it is integrated of order one. The postulations of the test of PP in Table 5 also shows that gold price indicator is not stationary at level but rather it is stationary at first difference. According to the same postulations provided for by the ADF test we also allude that according to the PP test gold price is not integrated of order zero but rather it is integrated of order one. Therefore, in this research it is clear that gold price has one order of integration as per the PP and the ADF test.

In addition to that, oil price as per ADF test is stationary. However, at 5% level of significance oil price is not stationary at level according to the ADF test. The findings also shows that oil prices at first difference is stationary at 1% significant level. Therefore, in this research study according to the ADF test we provide that at 5% level oil price indicator is at level not stationary, but rather at 1st difference it is stationary indicating that this variable is not integrated of order zero but rather it is integrated of order one. According to the observations provided for by the PP test oil price indicator at level is not stationary but rather at 1st difference it is stationary. Thus, according to the PP test the value oil price is not integrated of order zero but rather it is integrated of order one. Therefore, in this study we provide that oil price indicator as per the ADF and the PP tests of unit root, it is integrated of order one.

At this point, we have ascertained the order of integration of all the variables global economic policy uncertainty, Bitcoin, gold price and oil price. We have observed that global economic policy uncertainty is integrated of order 0, whereas the other indicators Bitcoin, gold price and oil price are integrated of order one. Therefore, the indicators employed in this research study are integrated of both order

zero and order one hence it is okay to use the Autoregressive Distributive lag model which allows for indicators that are integrated of both order zero and order one.

Var Lag order selection Criteria

The optimal lag selection is considered to be a crucial step in an ARDL model. An economic theory sometimes directs the selection method but the statistical techniques of lag selection is considered to be much more accurate, because too many lags inflate the standard errors of coefficient estimates implying an increase in the forecast error, on the other hand if the lag orders are less than the required number might result in an estimation bias. The Schwarz Criterion (SC) of lag selection is used in this thesis.

Table 6.VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-238.7095	NA	0.000745	4.148881	4.243314	4.187220
1	368.7605	1163.020	3.03e-08	-5.961719	**-5.489552***	-5.770025
2	394.0048	46.60473	2.59e-08*	-6.119740*	-5.269840	-5.774691*
3	406.1321	21.55973	2.77e-08	-6.053540	-4.825908	-5.555137
4	416.4683	17.66863	3.07e-08	-5.956722	-4.351356	-5.304964
5	427.5081	18.11668	3.36e-08	-5.871934	-3.888834	-5.066820
6	437.1782	15.20761	3.79e-08	-5.763729	-3.402897	-4.805260
7	449.0079	17.79512	4.13e-08	-5.692442	-2.953877	-4.580618
8	468.2822	27.67588*	3.99e-08	-5.748413	-2.632114	-4.483234

The optimal lag length selected is 1 based on SC criterion as shown in the Table 6, because -5.489552 is the smallest figure among the corresponding numbers in the SC column.

ARDL Cointegration Bound Tests

In order to examine the long-term equilibrium relationship between the variables a cointegration test is estimated. The ARDL bound test is used in order to test the cointegration between the time series data used. The null hypothesis for this test is that there is no cointegration. The ARDL model uses the bounds test model to test for the existence of a level relationship in a model. The bounds test model alludes that, in a model cointegration exists if the value of the F-statistics or the t-statistics is greater than the upper and the lower bounds, that is, the I(1) and I(0) values.

In the case of the first model where Bitcoin is specified as the dependent variable, the Table 7 shows that, for the bounds test, F-statistics is higher than the values of 1(0) and 1(1) at 10% critical value. For the t-Bound test the value of t-statistics for 1(0) and 1(1) is greater than the critical values so we reject the null hypothesis of no level relationship. Due to the findings provided for in this Table 6 for the bounds test analysis of ARDL model, where Bitcoin is the dependant variable, we therefore conclude that this model has a significant long run association and hence an error correction model as per a ARDL model can be specified.

Furthermore, the Table 7 also provides the results of the second model where GEPU is specified as the dependent series. The outcomes of Table 7 shows that, when GEPU is specified as the dependent series the F-statistic value is greater than the upper and lower bounds at 1% level of significance. Moreover, the t-statistic value is also greater than the upper and the lower bounds values at 1% level of significant. Therefore, this shows that in this model a long run association exists between GEPU and the explanatory variables employed. Thus, it is clear from the outcomes in Table 7 that the two models that have been employed in this study, where Bitcoin is the dependent variable and where global economic policy uncertainty is dependant

variable, there is an existence of a long run association and hence an error correction model or a long run ARDL model can be specified.

Table 7: Cointegration test

H0: No levels relationship							
F-statistic							
BTC				**GEPU**			
Value	*Signif.*	*I(0)*	*I(1)*	*Value*	*Signif.*	*I(0)*	*I(1)*
Asymptotic: n=1000							
6.224	10%	3.47	4.45	7.609	10%	3.47	4.45
	5%	4.01	5.07		5%	4.01	5.07
	1%	5.17	6.36		1%	5.17	6.36
Finite Sample: n=80							
	10%	3.588	4.605		10%	3.588	4.605
	5%	4.203	5.32		5%	4.203	5.32
	1%	5.62	6.908		1%	5.62	6.908
t-statistic							
Value	*Signif.*	*I(0)*	*I(1)*	*Value*	*Signif.*	*I(0)*	*I(1)*
-4.786760	10%	-3.13	-3.84	-5.454	10%	-3.13	-3.84
	5%	-3.41	-4.16		5%	-3.41	-4.16
	1%	-3.96	-4.73		1%	-3.96	-4.73

Long Run Estimate (ARDL)

In this section of the study, we provide the findings of the long run ARDL model for the two models specified in this study. It must be noted that the two models specified are: where Bitcoin is the dependant variable and the other variables such as, global economic policy uncertainty, gold and oil prices are the independent variables

and the other model is where GEPU is the dependent series and the other variables Bitcoin, gold and oil prices are the independent variables. The cointegration test provided for in the section above of the ARDL bounds test model makes it possible for the researchers to specify a long run relationship, since the F-statistics and the t-statistics values are greater than the upper in the lower bounds. The findings provided in Table 8 shows that in the case where Bitcoin is the dependent variable, global economic policy uncertainty is observed to provide a negative cause on Bitcoin. This gives that when GEPU increases by 1 then investment in Bitcoin tends to reduce by 1.99 units. This shows that a rise in global economic policy uncertainty has a negative cause on Bitcoin investment. Thus, in order for Bitcoin investment to be encouraged among countries then uncertainties in the global economic policies have to be reduced. These findings are significant at 1% indicating that a strong negative connection exists. The findings of Table 8 also shows that the relationship between gold prices and Bitcoin is an insignificant one. Therefore, we conclude in this research that, there is no significant impact of gold prices on Bitcoin. However, the Coefficient value of gold prices when Bitcoin is the dependent variable is a negative one showing that gold prices should negatively impact Bitcoin, but this relationship is not significant hence there is no significant relationship between the two variables. Oil price is also observed, according to the outcomes of Table 8 that it exhibits for a positive impact on Bitcoin. The postulations gives that a rise in oil prices by one unit causes Bitcoin to rise by 0.9 8 units. The findings are significant at 10% level hence this relationship is a significant one. Thus, we conclude that oil and Bitcoin are positively related such that when oil prices increase this has an effect of promoting Bitcoin investment.

Table 8: Long Run ARDL Analysis

Dependent Variable	BTC		GEPU	
Variable	*Coefficient*	*t-Statistic*	*Coefficient*	*t-Statistic*
BTC			-0.132223	-2.674***
GEPU	-1.998560	-3.0297***		
GOLD	-0.908763	-0.762	0.543	1.851*
OIL	0.987966	1.801*	-0.016	-0.101

***; **; *; shows 1%; 5%; 10% level of significant, respectively

Furthermore, in the case where global economic policy uncertainty is the dependant variable, Table 8 provides that there is a significant negative effect of Bitcoin on GEPU. This shows that an increase in Bitcoin by one unit has the effect of reducing GEPU by 0.13 units. The relationship among Bitcoin and GEPU is a strong significant one, since it is significant at 1% level. Therefore, we allude that in the long run, Bitcoin investment has a tendency of lowering uncertainty it in the global economic policies. Therefore, nations should promote the investment in Bitcoin in order to curb the negative impacts of global policy uncertainties. The findings given in Table 8 also gives that gold prices have a positive impact on global economic policy uncertainties. An increase by one unit of gold, in the long run tends to increase global economic policy uncertainty by 0.54. Therefore, in order to reduce uncertainty in the global economic arena then gold prices should be lowered. The findings also shows that association among oil prices and GEPU is an insignificant one. Thus, oil prices have no impact on global economic policy uncertainties. However, the coefficient value is a negative one indicating that oil prices should negatively affect global economic policy uncertainty, such that an increase in oil prices will reduce global economic policy uncertainties.

ARDL Long Run CUSUM Test

In order to check for structural breaks or changes in a regression equation, the CUSUM test is used. Inferences are based on a sequence of sums of recurring residuals computed in a frequentative manner from sequential subsamples of the data. The graph below shows the blue line between the red dotted lines at 5% significance level. This means that the obtained long-run relationships among the variables were stable during the analysis. It should be noted that the CUSUM SQ could also be applied to test the presence of heteroskedasticity; however, as in the estimated model, the standard errors are adjusted using HAC, application of CUSUM SQ here is not relevant. The stable pattern observed in the below figure further suggests that the main reason for the non-detection of the long run estimations (insignificant

coefficients) is not related to the presence of structural changes. It is highly be affected by the non-linear phenomena that the ARDL model missed capturing.
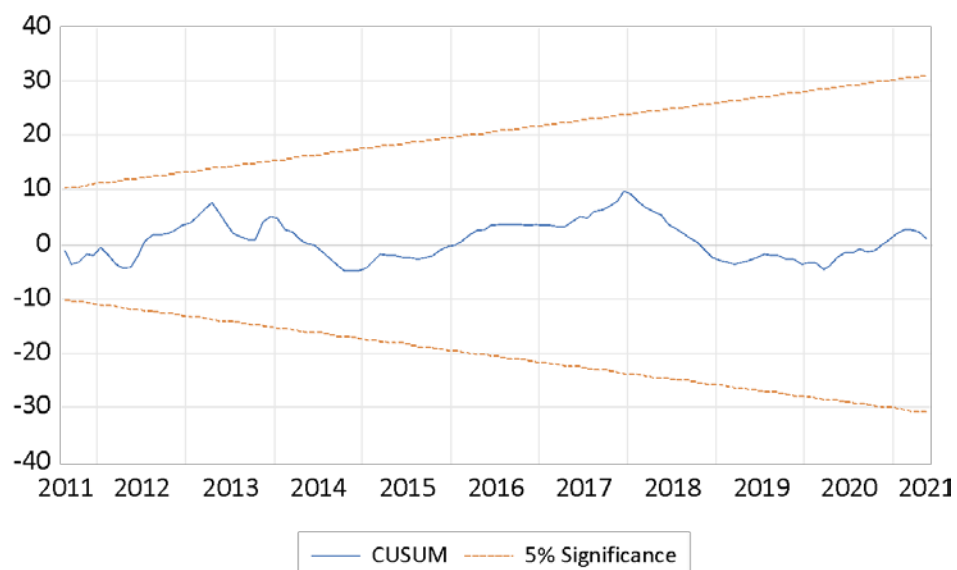

Figure 3: Long Run CUSUM Test

ARDL Long Run RAMSEY RESET Test

The test was developed by Ramsey (1969. The Ramsey RESET, detects on whether the model is well-specified or not. The hypothesis are as follows;

H0: The model is well specified

H1: There is misspecification error

Table 9: Ramsey RESET Test

Ramsey RESET Test

Equation: LR

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	0.029511	117	**0.9765**
F-statistic	0.000871	(1, 117)	**0.9765**
Likelihood ratio	0.000923	1	**0.9758**

From Table 9, we can see that the computed probability of the t-statistics, the F-statistics and the Likelihood ratio are all above 0.05 of the alpha value. Therefore, the null hypothesis cannot be rejected, there is no misspecification error in the model.

Short Run Estimation of ARDL

In the Table 10 below, this research study gives the outcomes of the short run ARDL technique, for the two models employed in this research, the first one where Bitcoin is expressed as the dependent variable and the other variables, such as GEPU, gold and oil prices are the independent variables and the second model where GEPU is the dependent series and the other variables are the independent at the variables. Of crucial significance, is the error correction term. The results provided for in Table 10 shows that for both models where Bitcoin is the dependent variable and where global economic policy uncertainty is dependant variable, the error correction terms are negative coefficients and significant at 1% level. This shows that, in both the 1st and the second model these variables tend to have a significant long run association and will tend to converge towards a long run equilibrium. The rate of adjustment towards a long run equilibrium for the model where Bitcoin is the dependant variable is 17% which is very low below 50% showing that the equilibrium is going to take a

long time to be achieved. Also, the rate of adjustment towards an equilibrium long run association, in the model where global economic policy uncertainty is the dependent variable, is 44.2% which is also low less than 50% indicating that it will take long for a long run equilibrium to be achieved.

The outcomes provided for in Table 10 shows that, the first lag of Bitcoin has a positive significant impact on Bitcoin investment, whereas the second lag Bitcoin has a negative significant impact on current Bitcoin investment. This shows that, one period lag of Bitcoin investment increases or promotes future Bitcoin investment, whereas a two-time lag period of Bitcoin investment tends to discourage future Bitcoin investment. The findings also provided for in Table 10 shows that in the short run GEPU has a significant negative effect on Bitcoin investment. This shows that short run shocks from global economic policy uncertainty tends to reduce investment in Bitcoin. Therefore, in order for nations to improve investment in Bitcoin then uncertainty in the global economic policies have to be reduced. Oil prices provides a significant positive impact on Bitcoin investment in the short run. A rise in the oil prices by one unit, in the short run, tends to improve Bitcoin investment by 0.17. Therefore, we provide that in order for nations to benefit from short run Bitcoin investment then oil prices should be kept high.

In the case where GEPU is expressed as the dependent series, the outcomes given in Table 10 gives that Bitcoin provides a negative impact on GEPU in the short run. An increase in Bitcoin investment in the short run by one unit tends to reduce global economic policy uncertainty by 0.058 units. The relationship is a significant one at 5% level showing that, indeed Bitcoin investment affects GEPU. We also provide in Table 10 that the first lag value of GEPU has a significant positive effect on current GEPU. This shows that high rates of uncertainty in the global economic policy from the past tends to cause future uncertainties to increase. Gold prices is set to give for a significant positive impact on GEPU in the short run, such that an increase in the gold prices by one unit in the short run tends to increase global economic policy uncertainty by 0.96 units. Oil prices gives a significant negative impact on GEPU in the short run, such that a rise in oil price by 1 unit in the short run tends to reduce global economic policy uncertainty by 0.24 units. This shows

that high oil prices have the effect of stabilising uncertainties in the global economic policies.

Table 10: Outcomes of short-run ARDL

Dependent Variable	BTC		GEPU	
Variable	*Coefficient*	*t-Statistic*	*Coefficient*	*t-Statistic*
BTC			-0.058	-2.427**
BTC(-1)	1.216	14.64***		
BTC(-2)	-0.392	-5.14***		
GEPU	-0.352	-2.944***		
GEPU(-1)			0.558	6.894***
GOLD	-0.160	-0.726	0.962	2.078**
GOLD(-1)			-0.722	-1.559
OIL	0.174	1.650*	-0.243	-1.807*
OIL(-1)			0.236	1.786*
ECM(-1)	-0.176	-5.054***	-0.442	-5.588***
R-squared		0.9910		0.817
Adjusted R-squared		0.9906		0.806
F-statistic		2133.9***		73.79***

***; **; *; shows 1%; 5%; 10% level of significant, respectively

ARDL CUSUM Test

The CUSUM test figures for both models specified in this study shows that the plotted blue line graph lies between the red line at 5% level of significance level, which means that the structural breaks in the model have been rectified successfully.
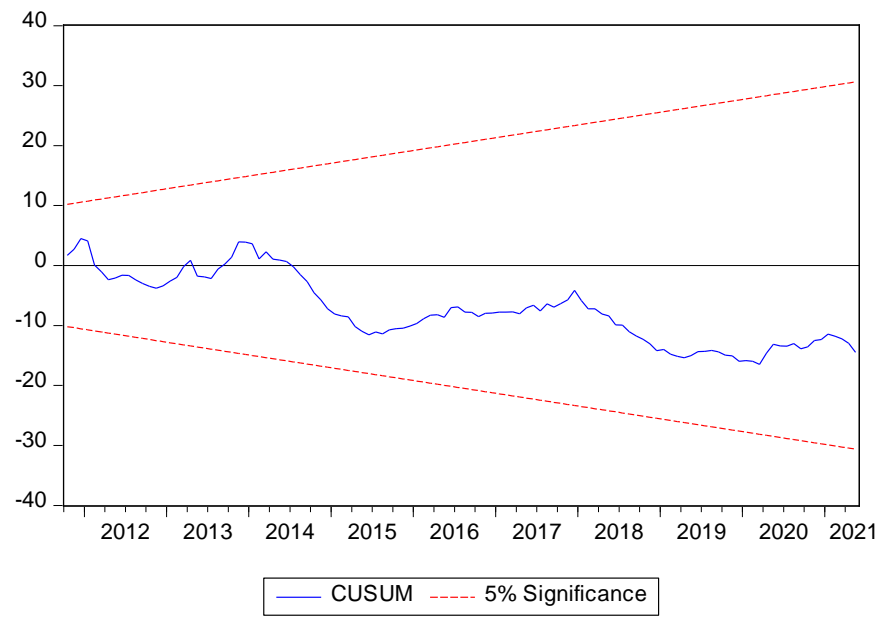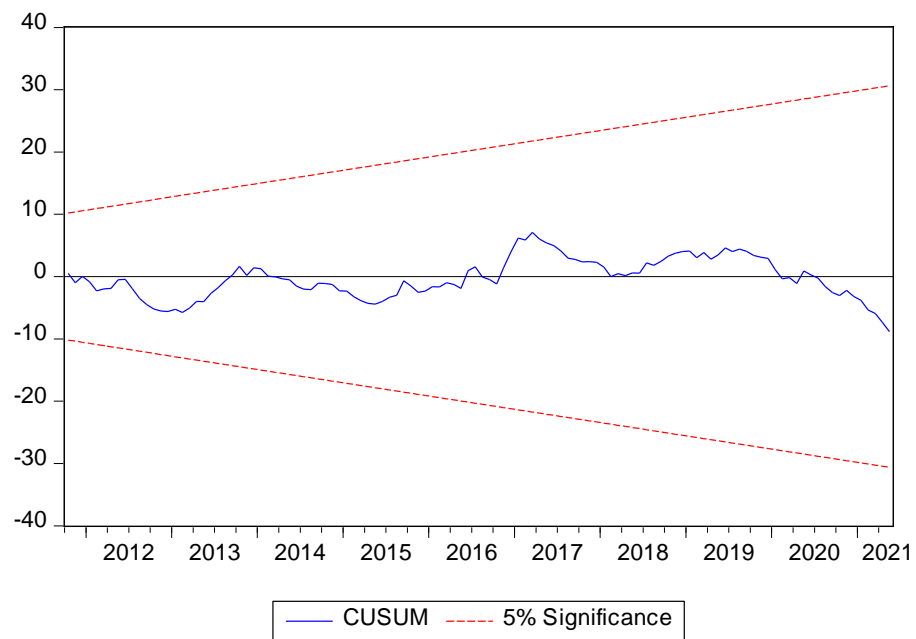
Figure 4: CUSUM test: BTC

Figure 5: CUSUM test: GEPU

ARDL Residual Diagnostics Test

This section gives the outcomes of the residual diagnostic test, serial correlation by using Breusch-Godfrey tests, and for heteroskedasticity by use of ARCH technique. The postulations in Table 11 shows that at 1% level of significant the first model where Bitcoin is the dependent variable does not have serial correlation problems and the model does not suffer from heteroskedasticity problems. Thus, when Bitcoin is expressed the dependent variable in a model, the residuals are not serially correlated and they are homogenous. Moreover, the Table 11 below also shows that for the second model where global economic policy uncertainty is dependant variable, there is no serial correlation problem and that the residuals are homogeneous. The residual diagnostic tests are very important for ascertaining the robustness of the findings of the study. Therefore, in this research due to the unavailability of serial correlation problems and heteroskedasticity problems we provide that the models in this study and the method used, the ARDL model, gives robust results are crucial for police making.

Table 11: Outcomes of Residual Diagnostics

	Breusch-Godfrey Serial Correlation LM Test:	**Heteroskedasticity Test: ARCH**
Dependent Variable	*F-statistic*	*F-statistic*
BTC	1.071	0.079
GEPU	0.224	0.137

***; **; *; shows 1%; 5%; 10% level of significant, respectively

Quantile Estimation Results

In this section of the study, we provide the outcomes of the Quantile regression analysis. We first of all start by providing the outcomes of the quantile

regression analysis when GEPU is the dependent series in Table 12 and later provide the outcomes of the quantile regression analysis when Bitcoin is the dependent variable in Table 13.

The findings provided for when GEPU is the dependent series shows according to the quantile regression analysis that Bitcoin gives significant positive effect on GEPU in the first quantile throughout to the 6th quantile. However, in the 7th quantile, 8th quantile and the 9th quantile show that Bitcoin does not affect GEPU. Inasmuch as the coefficient values in these quantiles are positive implying that a positive effect should be observed from Bitcoin to GEPU. Therefore, in the thesis we give that Bitcoin has a significant positive effect on global economic policy uncertainty in the lower and middle quintiles, whereas in the upper quantile it does not provide any significant effect. The outcomes provided for in Table 12 on the association that exists among Bitcoin and GEPU implies that when Bitcoin increases then GEPU will tend to increase in the same manner. This alludes that in the short run Bitcoin investment tends to rise GEPU. As a result, the findings of this study shows that an investment in Bitcoin is accompanied by global economic policy uncertainty, hence Bitcoin investment cannot be considered as a safe haven investment but rather as a speculative one.

Table 12: Quantile Regression analysis results; GEPU is dependent variable

Depedent Variable: GEPU			
Quantile	*GEPU Coefficient (t-Statistic)*	*BTC Coefficient (t-Statistic)*	*GOLD Coefficient (t-Statistic)*	*OIL Coefficient (t-Statistic)*
0.1		0.039 (3.661***)	1.664 (10.913***)	-0.518 (-9.698***)
0.2		0.051 (4.232***)	1.569 (9.644***)	-0.462 (-7.983***)
0.3		0.045 (3.908***)	1.549 (9.752***)	-0.444 (-6.793***)

0.4	0.047	1.492	-0.412
	(3.839***)	(8.742***)	(-5.615***)
0.5	0.047	1.474	-0.392
	(3.452*)	(8.041***)	(-4.541***)
0.6	0.049	1.391	-0.511
	(1.947*)	(4.387***)	(-2.949***)
0.7	0.051	1.067	-0.509
	(1.723)	(2.962***)	(-2.453**)
0.8	0.046	0.746	-0.537
	(1.489)	(2.389**)	(-2.400**)
0.9	0.044974	0.715	-0.436
	1.239338	(2.051**)	(-1.758*)
Ramsey RESET Test	0.637		

***; **; *; shows 1%; 5%; 10% level of significant, respectively

Moreover, the outcomes of the quantile regression analysis in table 12 gives that gold price indicator has a positive impact on global economic policy uncertainty throughout all quantiles. The findings on the relationship that exists between gold prices and GEPU in the short run in Table 12 are significant at 5% level, showing that the link that exists between the two indicators is a strong one. It follows that throughout the whole quantiles, lower, middle and upper quantiles, from quantile one to quantile 9 exhibit for a positive association among gold price and GEPU. This shows that a rise in gold prices tend to raise global economic police uncertainty. For example, in the first quantile up to the 5th quantile an increase in one unit of gold price tends to increase global economic policy uncertainties by around 1.5 units, whereas in the 6th and the 7th quantile an increase in one unit of gold price in the short run tends to increase global economic policy uncertainty by around 1 unit and in the 8th and in the 9th quantile an increase in one unit of gold price increases global economic policy uncertainty by around 0.7 units. These findings shows that when gold prices increase, this has an effect of increasing global economic policy uncertainty. As a

result, gold prices need to be stabilized and kept at lower levels in order for the uncertainty in the global economic uncertainty to be minimised. Therefore, the postulations of this study shows that gold is a crucial asset that can act as a safe haven during periods of high global economic policy uncertainty.

However, the outcomes provided for in Table 12 shows that oil price throughout all the quantiles from quantile 1 to the 9th quantile provides for a significant negative impact on GEPU. This result shows that from the first quantile throughout to the 9th quantile an increase in the oil prices tends to decrease GEPU. As a result, in the short run if the prices of oil are increased then GEPU will be reduced and if the prices of oil are reduced then GEPU will increase. The findings provided for in Table 12 shows that when oil prices increase by one unit in the first one, 6th quantile 7th quantile and 8th quantile then GEPU will decrease by approximately 0.5 units, whereas in the second quantile, 3rd quantile, 4th quantile, 5th quantile and the 9th quantile an increase in the oil prices by one unit tends to decrease global economic policy uncertainty by around 0.4 units.

Table 13: Quantile Regression analysis results; BTC is dependent variable

Depedent Variable: BTC				
Quantile	*GEPU Coefficient (t-Statistic)*	*BTC Coefficient (t-Statistic)*	*GOLD Coefficient (t-Statistic)*	*OIL Coefficient (t-Statistic)*
0.1	2.949 (3.299***)		-7.026 (-3.361***)	-2.518 (-3.175***)
0.2	3.519 (4.752***)		-8.269 (-4.182***)	-1.748 (-2.131***)
0.3	3.295 (4.842***)		-8.969 (-5.453***)	-1.479 (-2.146**)
0.4	3.544 (5.174***)		-10.276 (-6.181***)	-1.116 (-1.609)
0.5	3.981		-9.297	-0.532

	(6.016***)	(-4.746***)	(-0.789)
0.6	4.368	-7.777	-0.891
	(6.404***)	(-3.478***)	(-1.096)
0.7	2.761	-5.030	-2.164
	(2.301**)	(-1.786*)	(-1.314)
0.8	1.765	-3.220	-1.868
	(1.137)	(-0.889)	(-0.731)
0.9	0.672	-0.219	-4.128
	(0.297)	(-0.052)	(-1.116)
Ramsey RESET Test	0.322		

***; **; *; shows 1%; 5%; 10% level of significant, respectively

The outcomes of Table 13 shows that when Bitcoin is the dependent variable, GEPU has a significant positive impact on Bitcoin from the first quantile up until to the 7th quantile. However, in the 8th and 9th quantile global economic policy uncertainty does not have any significant impact on Bitcoin in the short run inasmuch as its coefficient value is a positive one showing that global economic policy uncertainty should increase Bitcoin investment, this is not significant. Therefore, we provide that GEPU has a significant positive impact on Bitcoin investment in the lower and middle quantiles, whereas in the upper quantile it does not provide any significant impact. The findings provided for in Table 13 shows that when global economic policy uncertainty increases by one unit then Bitcoin investment will tend to increase by an average of around 3 units throughout all the significant quantiles that is quantile one up to quantile 7. These findings shows that indeed global economic policy uncertainty if it increases it greatly causes a rise in the investment of Bitcoin showing that Bitcoin is a special asset that is considered as a safe haven during periods of high GEPU.

Moreover, the findings provided for in Table 13 also shows that gold price from the first quantile up until to the 7th quantile has significant negative impact on Bitcoin investment. However, in the eighth quantile and 9th quantile gold price does not provide any significant impact on Bitcoin inasmuch as its coefficient value is a negative one showing that gold price in these quantiles should negatively impact

Bitcoin. These findings shows that a rise in the price of gold tends to reduce the investment in Bitcoin. Thus, these outcomes shows that gold is considered as a more important asset that can be used as a safe haven as compared to Bitcoin. A rise in the gold prices by one unit throughout the quantiles have been observed to significantly cause Bitcoin investment to also increase by units that ranges from 5 to around 9. This shows that the impact of gold prices on Bitcoin is a very large impact and these two types of assets can be used as substitutes such that when one asset becomes more unstable another asset will be preferred. In the same lines when the price of gold decreases this means that investment in Bitcoin will tend to rise.

Moreover, the postulations provided for in Table 13 shows that oil prices in the first, second and third quantile exhibits for a significant negative impact on Bitcoin investment. However, from the fourth quantile up until to the 9th quantile, the relationship between oil prices in Bitcoin is an insignificant one, inasmuch as the coefficient value is a negative value indicating that when oil prices rise Bitcoin should fall but this is not significant. Therefore, we allowed that oil prices in the short run have a significant negative relationship with Bitcoin in the lower quantiles, whereas in the middle and upper quantiles oil prices would not provide any significant effect on Bitcoin. The outcomes of the Thesis give that in the lower quantile when oil prices increase by one unit then Bitcoin will tend to decrease by around 1.5 to 2.5 units. These findings also shows that when oil prices decreases then investment in Bitcoin will tend to increase. Therefore, it must be noted that the prices of oil need to be kept at minimum. And stable prices so as to encourage investment in the Bitcoin rather if the prices of oil are left to increase up to exorbitant prices, then Bitcoin investment will tend to decrease.

Table 14: Wald Test Results

H0: C(1); C(2); C(3); C(4) = 0		
	Depedent Variable	
	GEPU	*BTC*
GEPU		36.194***
BTC	11.915***	
GOLD	64.657***	22.529***
OIL	20.618***	0.623

***; **; *; shows 1%; 5%; 10% level of significant, respectively

The outcomes of the Wald test of the Quantile regression analysis in Table 14, gives that in the model where GEPU is dependent series, all the coefficients of the explanatory series (BTC, oil and gold prices) are not equal to 1. The outcomes of the wald test are significant alluding that the coefficients are not equivalent to zero, hence explanatory indicators have a significant effect on the GEPU series. Moreover, in the case where BTC is dependent series, the explanatory series, GEPU and gold prices have coefficients that are not equal to 0, while oil price coefficient is equal to 0. As a result, BTC is significantly affected by GEPU and gold price and not by oil price

CHAPTER V

Discussion, Conclusion and Recommendations

Discussion

It is very crucial to note that this study uses Autoregressive Distributive Lag model and the Quantile Regression analysis model. The autoregressive distributive lag model is very crucial model because it provides both the results of the short run outcomes and those of the long run outcomes. The long run results in a study are very crucial because they are the ones that are reliable and can be used for policy implication. Thus, in this study we check the outcomes provided for in the short run autoregressive distributive lag model to understand the short-term variations between the variables under study and also confirm the findings of the autoregressive distributive lag model outcomes with those of the quantile regression analysis. The quantile regression analysis is also a very crucial short run methodology which presents robust results because it is a modification of the traditional ordinary least square technique which is strong in the presence of normality problems and heteroskedasticity problems. Also, it is very crucial to understand that in this model we specify 2 models, the first model is when GEPU is the dependent series so that we understand how the other variables such as Bitcoin, gold prices and oil prices impact the GEPU. The other model is the one where Bitcoin is expressed as the dependent variable so that we examine the impact of the other variables such as GEPU, gold prices and oil prices on Bitcoin investment. These models are very crucial because they help governments, policy makers and economists to come up with policy implications that can be used and be applied to help the economic systems of the global nations.

According to the findings provided for by the short run autoregressive distributed lag model in the first model, where GEPU is the dependant variable, Bitcoin, gold price and oil price have a significant short run effect on GEPU. The findings of the short turn autoregressive distributed lag model shows that Bitcoin has a negative impact on GEPU as well as oil price exhibits for a negative impact on GEPU in the short run, whereas gold price have a positive impact on GEPU. These findings are very crucial because they are significant and they show that GEPU has a negative association with

Bitcoin investment and oil prices, in such a way that when Bitcoin investment and oil prices increases then GEPU is going to be reduced. Thus, this shows that in order for GEPU to be reduced in the short run, then Bitcoin investment and an increase in oil price should be encouraged. As a result, we can observe that Bitcoin is a very crucial asset that is reliable just like other commodity assets and can be used as a safe haven since it has got the effect of reducing global economic policy uncertainties. However, gold prices are observed to exhibit for a positive relationship with global economic policy uncertainties. This shows that when gold prices increases then GEPU in the short run will also tend to increase in the same manner. Thus, in order for global nations to reduce uncertainty in the economic system then they should stabilise and lower the prices of gold. This is so because gold is a very crucial asset that can be used as a safe haven and is an important commodity in the economic system. Thus, if its prices are left to increase and become very exorbitant then this can lead to some uncertainties in the economic system of the global economy. The findings of the autoregressive distributive lag model on the association that exists between Bitcoin and GEPU support the postulations of past studies that shows that Bitcoin is not a safe haven and should not be used as the store of value, Kristouk and Scales (2015); Cheah and Fry (2015); Bour, et al. (2015); Bouri, et al. (2017); Jiang, et al. (2018).

The findings provided for by the quantile regression analysis when GEPU is the dependent series concurs with the outcomes of the short run autoregressive distributive lag model when GEPU is the dependant series. The quantile regression analysis also provides that all the variables Bitcoin, gold prices and oil prices exhibit for a significant impact on GEPU in the short run. Hold prices are observed to exhibit for a positive impact on GEPU, while oil prices are observed to exhibit for a negative impact on GEPU in the same lines with the postulations of the autoregressive distributive lag model. However, some few differences are observed on the effect of Bitcoin on GEPU, between two methodologies employed in this study, that is, autoregressive distributed lag model and quantile regression analysis. In the quantile regression analysis, it is observed that Bitcoin exhibits for a positive impact on GEPU. The positive relationship that is observed by the quantile regression analysis on the association that exists between Bitcoin investment and GEPU shows that when Bitcoin investment increases then GEPU will also tend to increase in the same manner. This shows that Bitcoin investment is not a safe haven investment and cannot be used as an

important investment but rather as a speculative investment. The findings of the quantile regression analysis on the positive relationship that exists between global economic policy and bitcoin concurs with the findings of past studies that shows that Bitcoin is not a safe haven and should not be used as the store of value, Cheah and Fry (2015); Kristouk and Scales (2015); Bour, et al. (2015); Bouri, et al. (2017); Jiang, et al. (2018). This is so because Bitcoin is a very risky asset due to its high volatility, Buek and Elbert (2015); Dawyer (2015); Yang and Kim (2015); Ranagiotidis, et al. (2018). It can also be hacked since it is operated via the Internet, Yermack (2013), and is not regulated by any Central Bank of the world, hence making it riskier. In essence the Bitcoin is commonly used as a speculative instrument that is traded over the Internet to benefit from short term changes in the prices of Bitcoin with respect to other currencies and assets such as gold and oil.

In the second model where Bitcoin is expressed as a dependant variable, the outcomes provided for by the short run autoregressive distributed lag model shows that GEPU has a significant negative effect on Bitcoin whereas gold price has an insignificant negative impact on Bitcoin, and oil price has a positive effect on Bitcoin. These finding shows that, in the short run when GEPU increases then Bitcoin investment is going to decrease. These findings together with the findings of the autoregressive distributive lag model when GEPU is the dependant variable shows that Bitcoin and global economic policy uncertainty exhibits for a negative association, whereby if one variable increase then the other variable tend to decrease. Thus, again we provide that since an increase in global policy uncertainty would tend to decrease the investment in Bitcoin this shows that Bitcoin is not a safe haven asset, and that it cannot be used as the best alternative source of investment during periods of high uncertainties. These postulations concur with the findings of past studies that shows that Bitcoin is not a safe haven and should not be used as the store of value, Kristouk and Scales (2015); Cheah and Fry (2015); Bour, et al. (2015); Bouri, et al. (2017); Jiang, et al. (2018). This is so because Bitcoin is a very risky asset due to its high volatility, Buek and Elbert (2015); Dawyer (2015); Yang and Kim (2015); Ranagiotidis, et al. (2018). The positive impact of oil prices on Bitcoin shows that when the prices of all increases then the investment in Bitcoin will also tend to increase in the same manner, where is gold prices have been observed to have an insignificant relationship with Bitcoin even though the coefficient value is a negative one showing that if the price of gold

increases, then Bitcoin investment should decrease. This negative association that may exist between gold prices and Bitcoin shows that gold is a superior asset to Bitcoin and can be used as a safe haven.

The quantile regression model of this study provides some significant and very interesting results on the relationship between Bitcoin as a dependent variable with GEPU, gold price and oil prices. These findings are a bit different from those of the ARDL model, except only for the association of gold price and Bitcoin. The findings of the quantile regression model shows that GEPU has a significant positive influence on Bitcoin. The findings show that from quantile 1 to quantile 7, the association between GEPU with Bitcoin is a significant positive one. This findings of the quantile regression model on the impact of a GEPU on Bitcoin shows that the lower and middle quantiles provide a significant positive effect, whereas the upper quintiles have insignificant effect of GEPU on Bitcoin. Therefore, this study provides that when GEPU increases this has the effect of increasing Bitcoin at a global level. This shows that as EPU increases in the world investors tends to shun the forms of assets that are risky and opt for Bitcoin which is easy to use, can be traded via the Internet and does not need any government regulations in its operations. Therefore, the findings of this study support the postulations of past studies that provides that, Bitcoin is strong over high risks and is very important in the global market (Bouri, et al. 2017; Kusat, 2015; Dyhrbery, 2016; Wang, et al. 2019). As a result, the level and quantity of Bitcoin all over the world should be increased since this new form of asset is recognised as a better option during periods of GEPU.

In addition to that, the findings shows that the impact of oil prices on Bitcoin is insignificant from the 4th quantile to the 9th quantile, whereas a significant negative effect of oil prices on Bitcoin is observed from the 1st quantile to the 3rd quantile. Therefore, we allude that oil prices provide an insignificant effect on Bitcoin in the middle and upper quantiles but in the case of the lower quantiles, a significant negative effect on Bitcoin is observed. Thus, an increase in the global oil prices tends to decrease the use of Bitcoin all over the world. These findings shows that Bitcoin is reduced by high oil prices in the world.

Moreover, we also observed that the findings of the quantile regression model shows that the global gold prices have a significant negative impact on Bitcoin in the first to

the 7th quantile, whereas the 8th and 9th quantiles provide an insignificant effect on Bitcoin, however the coefficient value is negative indicating that gold prices should negatively affect Bitcoin in the world. The negative effect of gold prices on Bitcoin in the world shows that gold is a superior asset to Bitcoin, as a result, as the prices of gold increases investors tends to demand more of gold assets than Bitcoin assets. This is so because Bitcoin is too volatile, Buek and Elbeck (2015); Dawyer (2015); Yang and Kim (2015); Panagiotidis, et al. (2018). Therefore, the Bitcoin is not necessarily considered as a safe haven for investors to safely store their assets in comparison with gold. Thus, this study supports the postulations of previous studies who provided that Bitcoin is not a safe haven, Jiang, et al. (2018); Bouri, et al. (2017); Bour, et al. (2015); Kristoufek and Sacles (2015) and tends to lose value abruptly (Cheah & Fry, 2015).

Of great significance is the outcomes of the long run ARDL model, because these are the outcomes that can be used for policy implication. The outcomes provided for by the ECT of the long run association between the variables under study for both the models where GEPU and Bitcoin are expressed as the dependant variable shows that GEPU with the other variables such as Bitcoin, gold and oil price exhibits for a significant long run association. This means that these variables are linked in a long run association and hence can be expressed in a long run model to understand the long run association that exists between the variables. Considering the first model where GEPU is expressed as the dependent series it is observed that it is only Bitcoin and gold prices that have a significant impact on global economic policy uncertainty while oil prices does not exhibit for any significant impact on global economic policy uncertainties. The outcomes shows that Bitcoin has a negative significant effect on GEPU, indicating that when Bitcoin investment increases then the global economic policy uncertainty will decrease. These finding shows that Bitcoin is a very crucial asset that needs to be encouraged since an increase in the investment of Bitcoin tends to reduce the uncertainty in the in the global economy in the long run. These findings also support the postulations of past studies who show that Bitcoin is useful as safe haven and a reliable asset and that it is strong over high risks and is very important in the global market (Bouri, et al. 2017; Kusat, 2015; Dyhrbery, 2016; Wang, et al. 2019). Bitcoin is strong over high risks and is very important in the global market (Bouri, et al. 2017; Kusat, 2015; Dyhrbery, 2016; Wang, et al. 2019). As a result, the level and quantity of Bitcoin all over the world should be increased since this new

form of asset is recognised as a better option during periods of global economic policy uncertainty. However, these outcomes do not support the postulations of previous studies who provided that Bitcoin is not a safe haven, Jiang, et al. (2018); Bouri, et al. (2017); Bour, et al. (2015); Kristoufek and Sacles (2015) and tends to lose value abruptly (Cheah & Fry, 2015). This is so because Bitcoin is a very risky asset due to its high volatility, Buek and Elbert (2015); Dawyer (2015); Yang and Kim (2015); Ranagiotidis, et al. (2018). The differences on the outcomes of the current study with those of other past studied may be explained by the different data sets used, in this study world values of all the indicators are considered, whereas other studies use national or regional data sets.

Moreover, in the long run gold prices are also observed to exhibit for a positive impact on global economic policy uncertainty. This shows that high gold prices tend to increase uncertainties in the global economy. Therefore, the prices of gold need to be kept at minimum and low prices in order to avoid GEPU. These findings shows that gold is a very crucial asset in the world and if its price is left to increase and become so exorbitant this will result in high uncertainty in the economic systems of the world. Thus, policy makers, governments and economists should work towards minimizing and stabilising the prices of gold in order to reduce uncertainty in the world. Oil prices are also observed to exhibit for an insignificant relationship with global economic policy uncertainties in the long run. Thus, oil prices have no impact on uncertainties in the world in the long run.

 In the 2nd model where Bitcoin is considered as the dependent series it is observed that Bitcoin is only significantly impacted by GEPU and oil prices, whereas gold prices does not provide for any significant influence on Bitcoin. The findings of this study shows that GEPU exhibits for a significant negative effect on Bitcoin investment. These findings give that when high GEPU to increases this has the effect of reducing investment in Bitcoin. As a result, GEPU should be minimised and reduced in order for worldwide nations to promote Bitcoin investment which has been observed as a special asset and safe haven asset. High and increasing prices of oil has also been observed to be associated with high and increasing investment in Bitcoin. Thus, indeed Bitcoin is seen as a safe haven asset, since rises in oil prices tends to encourage Bitcoin investment which is observed as the best alternative source of investment

during periods of fluctuations in the oil prices. These postulations support the findings of past studies who alludes that Bitcoin is strong over high risks and is very important in the global market (Bouri, et al. 2017; Kusat, 2015; Dyhrbery, 2016; Wang, et al. 2019). As a result, the level and quantity of Bitcoin all over the world should be increased since this new form of asset is recognised as a better option during periods of GEPU. However gold prices have been seen to give an insignificant effect on Bitcoin in the long run. Thus, there is no association whatsoever that exists between gold prices in Bitcoin in the long run in the global economy.

Conclusion

The current study is very crucial for policy implications because it considers World economic indicators in ascertaining the relationship that exists between Bitcoin, GEPU, gold, oil prices and global gold prices. This research uses to models, the first one where GEPU is the dependent series and the 2nd one where Bitcoin is the dependent series, in order to ascertain the impact on GEPU and Bitcoin by other variables and amongst themselves. The current study also uses two major methodologies that provide robust results for policy implications, that is, the Autoregressive Distributive lag model and the Quantile Regression analysis model. This study provides that inasmuch as the Bitcoin is a more volatile asset, it is very crucial in the world economy. This is so because it negatively impacts GEPU. These postulations also support the postulations of past studies who shows that Bitcoin is useful as safe haven and a reliable asset and that it is strong over high risks and is very important in the global market (Bouri, et al. 2017; Kusat, 2015; Dyhrbery, 2016; Wang, et al. 2019). Also, a negative impact of GEPU on Bitcoin is observed, showing that when GEPU decreases then Bitcoin investment will increase. As a result, uncertainties in the global economy should be reduced for the purpose of promoting investment in Bitcoin. Thus, during periods of high political and economic uncertainty in the world, where the types of financial assets are eroding at a faster rate, the Bitcoin is the best alternative. Thus, it is encouraged that countries should encourage the use of Bitcoin as a new means of medium of exchange, just like Fiat money and other forms of payment such as the credit card and debit card transactions. This is all because the Bitcoin is operated through the Internet via what is known as blockchains

and can be sent or received between two individuals without the intervention of the government or the central Bank of various countries.

The current thesis also conclude that the Bitcoin is very crucial times of high and increasing rates of oil prices in the world. This is due to the existence of a positive effect of oil prices on Bitcoin. The positive impact of oil prices on Bitcoin shows that when the prices of oil in the global economy increases, then this has the effect of increasing the demand of Bitcoin. Thus again, we can see that Bitcoin is the best alternative source of asset in the world economy for security over the high rise and increase of oil prices in the world.

However, this thesis concludes that inasmuch as the Bitcoin is very crucial and can be used as a best alternative means of medium of exchange in the world economy due to it's being relatively easy to use, as it is operated over the Internet through blockchains which does not involve the regulations of the government and the central bank, it is relatively inferior to gold. This is so because this is providing that global gold prices have a negative effect on Bitcoin demand in the world. A rise in the prices of gold tends to reduce the demand of Bitcoin showing that when the value of gold increases then investors tend to demand more of gold assets than Bitcoin assets. This is so because the Bitcoin is more volatile, its prices or its value can change rapidly overtime it does not have proper physical denominated assets to be used is a backup or a security. Thus, this research shows that gold remains the best and most reliable asset in the financial market of the world.

Strength and limitations of the research

The current thesis provides robust and reliable results because it makes use of two best methodologies, that is, the Autoregressive Distributive lag model and the Quantile Regression analysis model that provides strong and reliable long run results that is very useful for policy implications. Thus, these two methodologies give the long run findings on the effect of Bitcoin, gold prices and oil prices of GEPU, as well as the effect of GEPU, oil prices and gold prices on Bitcoin in the world. These findings are very crucial for drafting policy implications that can be used by various stakeholders

in the financial markets. Moreover, the current thesis, unlike past studies make use of global dataset for all the indicators included in this study, that is, Bitcoin demand, GEPU, oil prices and global gold prices. Since, the current thesis uses global data set to analyse the association that exists between the dependent variable and the independent variables of each model respectively, this means that these findings can be used at a global level rather than at local levels which sometimes may not be generalised to other economies that have different economic conditions. The current study limitations are that it only considers the effect of global economic police uncertainty, global oil prices and global gold prices, on Bitcoin demand and the effect of Bitcoin demand, oil prices and gold prices on global economic development instability, without considering how Bitcoin and GEPU may affect gold prices and oil prices. However, this gap can be covered by future studies.

Policy implications

This study provides that governments and central banks of world nations should encourage the use of Bitcoin as a medium of exchange, store of value and as an alternative financial asset that can be used in the financial market. This is so because during times of high GEPU and high oil prices, Bitcoin is observed as the best alternative financial asset. The current thesis also provides that gold remains the best financial assets in the world as compared to Bitcoin. This is because when gold prices increase people tends to shun the use of Bitcoin by switching to gold which becomes more valuable.

Future studies recommendations

For the purpose of future studies, we encourage other studies to be done to examine the impact of Bitcoin and global economic development on gold prices and oil prices. By doing so the gap that exists in the literature will be covered and policy implications will be drawn basing on the findings. Understanding the impact of Bitcoin and global economic development on oil prices and gold prices is very crucial since the use of Bitcoin is increasing throughout the whole world.

REFERENCES

Aggarwal, S., Santosh, M., & Bedi, P. (2018). Bitcoin and Portfolio Diversification: Evidence from India. *Advances in Theory and Practice of Emerging Markets*, 99–115. Retrieved from https://doi.org/10.1007/978-3-319-78378-9_6

Al Mamun, M., Uddin, G. S., Suleman, M. T., & Kang, S. H. (2020). Geopolitical risk, uncertainty and Bitcoin investment. *Physica A: Statistical Mechanics and Its Applications*, *540*, 123107. Retrieved from https://doi.org/10.1016/j.physa.2019.123107

Alvarez-Ramirez, J., Rodriguez, E., & Ibarra-Valdez, C. (2018). Long-range correlations and asymmetry in the Bitcoin market. *Physica A: Statistical Mechanics and Its Applications*, *492*, 948–955. Retrieved from https://doi.org/10.1016/j.physa.2017.11.025

Baek, C. and Elbeck, M. (2015). Bitcoins as an investment or speculative vehicle? A first look. Applied Economics Letters, 22(1):30–34.

Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring Economic Policy Uncertainty*. *The Quarterly Journal of Economics*, *131*(4), 1593–1636. Retrieved from https://doi.org/10.1093/qje/qjw024

Balcilar, M., Bouri, E., Gupta, R., & Roubaud, D. (2017). Can volume predict Bitcoin returns and volatility? A quantiles-based approach. *Economic Modelling*, *64*, 74–81. Retrieved from https://doi.org/10.1016/j.econmod.2017.03.019

Bartos, J. (2015). Does Bitcoin follow the hypothesis of efficient market? *International Journal of Economic Sciences*, *IV*(2), 10–23. Retrieved from https://doi.org/10.52950/ES.2015.4.2.002

Bariviera, A., Basgall, M., Hasperue, W., & Naiouf, M. (2017). Some stylized facts of the Bitcoin market. Physica A: Statistical Mechanics and Its Applications, 484, 82e90.

Baur, D. G., Lee, A. D., & Hong, K. (2015). Bitcoin: Currency or Investment? *SSRN Electronic Journal*. Retrieved from https://doi.org/10.2139/ssrn.2561183

Baur, D. G., Dimpfl, T., & Kuck, K. (2018). Bitcoin, gold and the US dollar – A replication and extension. *Finance Research Letters*, *25*, 103–110. Retrieved from https://doi.org/10.1016/j.frl.2017.10.012

Bitcoin: A Peer-to-Peer Electronic Cash System. (2008). Bitcoin. Retrieved March 3, 2022, from https://bitcoin.org/en/bitcoin-paper

Blau, B. M. (2018). Price dynamics and speculative trading in Bitcoin. *Research in International Business and Finance*, *43*, 15–21. Retrieved from https://doi.org/10.1016/j.ribaf.2017.07.183

Bouoiyour, J. and Selmi, R. (2017). Are trump and bitcoin good partners?. In: Working Paper hal-01480031. HAL.

Bouri, E., Azzi, G., & Dyhrberg, A. H. (2017a). On the return-volatility relationship in the Bitcoin market around the price crash of 2013. *Economics*, *11*(1). Retrieved from https://doi.org/10.5018/economics-ejournal.ja.2017-2

Bouri, E., Gupta, R., Tiwari, A. K., & Roubaud, D. (2017b). Does Bitcoin hedge global uncertainty? Evidence from wavelet-based quantile-in-quantile regressions. *Finance Research Letters*, *23*, 87–95. Retrieved from https://doi.org/10.1016/j.frl.2017.02.009

Bouri, E., Jalkh, N., Molnár, P., & Roubaud, D. (2017c). Bitcoin for energy commodities before and after the December 2013 crash: diversifier, hedge or safe haven? *Applied Economics*, 1–11. Retrieved from https://doi.org/10.1080/00036846.2017.1299102

Bouri, E., Molnár, P., Azzi, G., Roubaud, D., & Hagfors, L. I. (2017d). On the hedge and safe haven properties of Bitcoin: Is it really more than a diversifier? *Finance Research Letters*, *20*, 192–198. Retrieved from https://doi.org/10.1016/j.frl.2016.09.025

Bouri, E., Das, M., Gupta, R., & Roubaud, D. (2018a). Spillovers between Bitcoin and other assets during bear and bull markets. *Applied Economics*, *50*(55), 5935–5949. Retrieved from https://doi.org/10.1080/00036846.2018.1488075

Bouri, E., Gupta, R., Lau, C. K. M., Roubaud, D., & Wang, S. (2018b). Bitcoin and global financial stress: A copula-based approach to dependence and causality in the quantiles. *The Quarterly Review of Economics and Finance*, *69*, 297–307. Retrieved from https://doi.org/10.1016/j.qref.2018.04.003

Brière, M., Oosterlinck, K., & Szafarz, A. (2015). Virtual currency, tangible return: Portfolio diversification with bitcoin. *Journal of Asset Management*, *16*(6), 365–373. Retrieved from https://doi.org/10.1057/jam.2015.5

Cheah, E. T., & Fry, J. (2015). Speculative bubbles in Bitcoin markets? An empirical investigation into the fundamental value of Bitcoin. *Economics Letters*, *130*, 32–36. Retrieved from https://doi.org/10.1016/j.econlet.2015.02.029

Conti, M., Sandeep Kumar, E., Lal, C., & Ruj, S. (2018). A Survey on Security and Privacy Issues of Bitcoin. *IEEE Communications Surveys & Tutorials*, *20*(4), 3416–3452. Retrieved from https://doi.org/10.1109/comst.2018.2842460

Corbet, S., Larkin, C. J., Lucey, B. M., Meegan, A., & Yarovaya, L. (2017). Cryptocurrency Reaction to FOMC Announcements: Evidence of Heterogeneity Based on Blockchain Stack Position. SSRN Electronic Journal. Retrieved from https://doi.org/10.2139/ssrn.3073727

Corbet, S., Meegan, A., Larkin, C., Lucey, B., and Yarovaya, L. (2018). Exploring the dynamic relationships between cryptocurrencies and other financial assets. Economics Letters, 165:28–34.

Corbet, S., Lucey, B., Urquhart, A., and Yarovaya, L. (2019). Cryptocurrencies as a financial asset: A systematic analysis. International Review of Financial Analysis, 62:182–199.

de la Horra, L. P., de la Fuente, G., & Perote, J. (2019). The drivers of Bitcoin demand: A short and long-run analysis. *International Review of Financial Analysis*, *62*, 21–34. https://doi.org/10.1016/j.irfa.2019.01.006

Demir, E., Gozgor, G., Lau, C. K. M., & Vigne, S. A. (2018). Does economic policy uncertainty predict the Bitcoin returns? An empirical investigation. *Finance Research Letters*, *26*, 145–149. Retrieved from https://doi.org/10.1016/j.frl.2018.01.005

Diebold, F. X., & Yilmaz, K. (2012). Better to give than to receive: Predictive directional measurement of volatility spillovers. *International Journal of Forecasting*, *28*(1), 57–66. Retrieved from https://doi.org/10.1016/j.ijforecast.2011.02.006

Dwyer, G. P. (2015). The economics of bitcoin and similar private digital currencies. Journal of Financial Stability, 17:81 – 91. Special Issue: Instead of the Fed: Past and Present Alternatives to the Federal Reserve System.

Dyhrberg, A.H. (2016a). Bitcoin, gold and the dollar — a GARCH volatility analysis. Financ. Res. Lett.16,85–92.

Dyhrberg, A. H. (2016). Hedging capabilities of bitcoin. Is it the virtual gold? Finance Research Letters, 16, 139–144. Retrieved from https://doi.org/10.1016/j.frl.2015.10.025

Elwell, C.K., Murphy, M.M., & Seitzinger, M.V., (2013). Bitcoin: questions, answers, and analysis of legal issues. Congressional Research Service Reports

Feng, W., Wang, Y., & Zhang, Z. (2018). Informed trading in the Bitcoin market. Finance Research Letters, 26, 63–70. Retrieved from https://doi.org/10.1016/j.frl.2017.11.009

Ghazani, M. M., & Khosravi, R. (2020). Multifractal detrended cross-correlation analysis on benchmark cryptocurrencies and crude oil prices. *Physica A: Statistical Mechanics and Its Applications*, *560*, 125172. Retrieved from https://doi.org/10.1016/j.physa.2020.125172

Hu, Y., Oxley, L., Lang, C., 2019. Can economic policy uncertainty, volume, transaction activity and twitter predict Bitcoin? Evidence from time-varying Granger causality tests. In: Working Papers in Economics. University of Waikato

Iosebashvili, I. (2019, November 21). *Dollar Edges Higher as Trade Tensions Build*. WSJ. Retrieved from https://www.wsj.com/articles/dollar-edges-higher-as-trade-tensions-build-11574368026

Jareño, F., González, M. D. L. O., López, R., & Ramos, A. R. (2021). Cryptocurrencies and oil price shocks: A NARDL analysis in the COVID-19 pandemic. Resources Policy, 74, 102281. Retrieved from

https://doi.org/10.1016/j.resourpol.2021.102281

Jiang, Y., Nie, H., & Ruan, W. (2018). Time-varying long-term memory in Bitcoin market. *Finance Research Letters*, *25*, 280–284. https://doi.org/10.1016/j.frl.2017.12.009

Katsiampa, P. (2017). Volatility estimation for Bitcoin: A comparison of GARCH models. Economics Letters, 158, 3–6. Retrieved from https://doi.org/10.1016/j.econlet.2017.06.023

Klein, T., Hien, P. T., & Walther, T. (2018). Bitcoin is not the new gold: A comparison of volatility, correlation, and portfolio performance. International Review of Financial Analysis, 59, 105–116

Kristoufek, L., & Scalas, E. (2015). What Are the Main Drivers of the Bitcoin Price? Evidence from Wavelet Coherence Analysis. *PLOS ONE*, *10*(4), e0123923. Retrieved from https://doi.org/10.1371/journal.pone.0123923

Kuo Chuen, D. L., Guo, L., & Wang, Y. (2017). Cryptocurrency: *A New Investment Opportunity? The Journal of Alternative Investments*, *20*(3), 16–40. Retrieved from https://doi.org/10.3905/jai.2018.20.3.016

Koutmos, D. (2018). Bitcoin returns and transaction activity. *Economics Letters*, *167*, 81–85. Retrieved from https://doi.org/10.1016/j.econlet.2018.03.021

Kubát, M. (2015). Virtual Currency Bitcoin in the Scope of Money Definition and Store of Value. *Procedia Economics and Finance*, *30*, 409–416. Retrieved from https://doi.org/10.1016/s2212-5671(15)01308-8

Li, Z. Z., Tao, R., Su, C. W., & Lobonţ, O. R. (2018). Does Bitcoin bubble burst? *Quality & Quantity*, *53*(1), 91–105. Retrieved from https://doi.org/10.1007/s11135-018-0728

Maghyereh, A., & Abdoh, H. (2020). Tail dependence between Bitcoin and financial assets: Evidence from a quantile cross-spectral approach. *International Review of Financial Analysis*, *71*, 101545. https://doi.org/10.1016/j.irfa.2020.101545

Mbanga, C. L. (2018). The day-of-the-week pattern of price clustering in Bitcoin. *Applied Economics Letters*, *26*(10), 807–811. Retrieved from https://doi.org/10.1080/13504851.2018.1497844

Mokni, K., Bouri, E., Ajmi, A. N., & Vo, X. V. (2021). Does Bitcoin Hedge Categorical Economic Uncertainty? A Quantile Analysis. *SAGE Open*, *11*(2), 215824402110163. Retrieved from https://doi.org/10.1177/21582440211016377

Matkovskyy, R. (2019). Centralized and decentralized bitcoin markets: Euro vs USD vs GBP. The Quarterly Review of Economics and Finance, 71, 270–279.

Matkovskyy, R., & Jalan, A. (2019). From financial markets to bitcoin markets: A fresh look at the contagion effect. Finance Research Letters. Retrieved from http://dx.doi.org/10. 1016/j.frl.2019.04.007. In press

Matkovskyy, R., Jalan, A., & Dowling, M. (2020). Effects of economic policy uncertainty shocks on the interdependence between Bitcoin and traditional financial markets. *The Quarterly Review of Economics and Finance*, *77*, 150–155. Retrieved from https://doi.org/10.1016/j.qref.2020.02.004

Mokni, K., Ajmi, A. N., Bouri, E., & Vo, X. V. (2020). Economic policy uncertainty and the Bitcoin-US stock nexus. Journal of Multinational Financial

Management, 57–58, 100656. Retrieved from https://doi.org/10.1016/j.mulfin.2020.100656

Nadarajah, S., & Chu, J. (2017). On the inefficiency of Bitcoin. *Economics Letters*, *150*, 6–9. Retrieved from https://doi.org/10.1016/j.econlet.2016.10.033

Okorie, D. I., & Lin, B. (2020). Crude oil price and cryptocurrencies: Evidence of volatility connectedness and hedging strategy. *Energy Economics*, *87*, 104703. Retrieved from https://doi.org/10.1016/j.eneco.2020.104703

Osterrieder, J., & Lorenz, J. (2017). A Statistical Risk Assessment of Bitcoin and its Extreme Tail Behavior. *Annals of Financial Economics*, *12*(01), 1750003. Retrieved from https://doi.org/10.1142/s2010495217500038

Panagiotidis, T., Stengos, T., & Vravosinos, O. (2018). On the determinants of bitcoin returns: A LASSO approach. *Finance Research Letters*, *27*, 235–240. Retrieved from https://doi.org/10.1016/j.frl.2018.03.016

Parino, F., Beiró, M. G., & Gauvin, L. (2018). Analysis of the Bitcoin blockchain: socio-economic factors behind the adoption. *EPJ Data Science*, *7*(1). Retrieved from https://doi.org/10.1140/epjds/s13688-018-0170-8

Pichl, L., & Kaizoji, T. (2017). Volatility Analysis of Bitcoin Price Time Series. *Quantitative Finance and Economics*, *1*(4), 474–485. Retrieved from https://doi.org/10.3934/qfe.2017.4.474

Qin, M., Su, W,. & Ran Tao, (2021). BitCoin: A new basket for eggs? Economic Modelling. Volume 94, 896-907. Retrieved from https://doi.org/10.1016/j.econmod.2020.02.031.

Shaikh, I. (2020). Policy uncertainty and Bitcoin returns. Borsa Istanbul Review, 20(3), 257–268. Retrieved from https://doi.org/10.1016/j.bir.2020.02.003

Su, C. W., Li, Z. Z., Tao, R., & Si, D. K. (2018). RETRACTED: Testing for multiple bubbles in bitcoin markets: A generalized sup ADF test. *Japan and the World Economy*, *46*,56–63. Retrieved from https://doi.org/10.1016/j.japwor.2018.03.004

Su, C. W., Qin, M., Tao, R., & Zhang, X. (2020). Is the status of gold threatened by Bitcoin? Economic Research-Ekonomska Istraživanja, 33(1), 420–437. Retrieved from https://doi.org/10.1080/1331677x.2020.1718524

Tiwari, A. K., Jana, R., Das, D., & Roubaud, D. (2018). Informational efficiency of Bitcoin—An extension. *Economics Letters*, *163*, 106–109. Retrieved from https://doi.org/10.1016/j.econlet.2017.12.006

Urquhart, A. (2016). The inrefficiency of bitcoin. Economics Letters 148, 80–82 Urquhart, A., 2018. What causes the attention of bitcoin? Econ. Lett. 166, 40–44.

Urquhart, A. (2017). Price clustering in Bitcoin. *Economics Letters*, *159*, 145–148. Retrieved from https://doi.org/10.1016/j.econlet.2017.07.035

Urquhart, A. (2018). What causes the attention of Bitcoin? *Economics Letters*, *166*, 40–44. Retrieved from https://doi.org/10.1016/j.econlet.2018.02.017

Vigna, P. (2015). The Age of Cryptocurrency: How Bitcoin and Digital Money Are Challenging the Global Economic Order. St. Martin's Press, Inc, New York.

Wang, G.J., Xie, C., Wen, D., Zhao, L. (2019). When Bitcoin meets economic policy uncertainty (EPU): measuring risk spillover effect from EPU to Bitcoin. Finance Res. Lett. 31

Wang, P., Li, X., Shen, D., & Zhang, W. (2020). How does economic policy uncertainty affect the bitcoin market? *Research in International Business and Finance*, *53*, 101234. Retrieved from https://doi.org/10.1016/j.ribaf.2020.101234

Wright, K. (2022, February 1). *Bitcoin network transaction volume surpasses American Express: Research*. Cointelegraph. https://cointelegraph.com/news/bitcoin-network-transaction-volume-surpasses-american-express-research

Wu, C., & Pandey, V. (2014). The value of bitcoin in enhancing the efficiency of an investor's portfolio. Journal of Financial Planning, 27(9), 44e52

Yang, I. S., & Kim, S. (2015). Analysis of Whole Transcriptome Sequencing Data: Workflow and Software. *Genomics & Informatics*, *13*(4), 119. Retrieved from https://doi.org/10.5808/gi.2015.13.4.119

Yermack, D. (2015). Is Bitcoin a Real Currency? An Economic Appraisal. *Handbook of Digital Currency*, 31–43. Retrieved from https://doi.org/10.1016/b978-0-12-802117-0.00002-3

Yin, L., Nie, J., & Han, L. (2021). Understanding cryptocurrency volatility: The role of oil market shocks. International Review of Economics & Finance, 72, 233–253. Retrieved from https://doi.org/10.1016/j.iref.2020.11.013

Zaghloul, E., Li, T., Mutka, M. W., & Ren, J. (2020). Bitcoin and Blockchain: Security and Privacy. *IEEE Internet of Things Journal*, *7*(10), 10288–10313. Retrived from https://doi.org/10.1109/jiot.2020.3004273
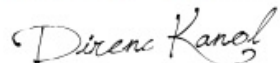
ETHICS COMMITTEE APPROVAL

22.06.2022

Dear Ashi Perveen

Your project "**Empirical Analyses On The Relationship Between Bitcoin On Global Economic Policy Uncertainty**" has been evaluated. Since only secondary data will be used the project it does not need to go through the ethics committee. You can start your research on the condition that you will use only secondary data.

Assoc. Prof. Dr. Direnç Kanol

Rapporteur of the Scientific Research Ethics Committee

Direnc Kanol

Note: If you need to provide an official letter to an institution with the signature of the Head of NEU Scientific Research Ethics Committee. please apply to the secretariat of the ethics committee by showing this document.

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