# Major research project on

# "An Investigation into the Impact of Gold, Crude Oil, Bitcoin, SPX, Interest Rates, Exchange Rates, and Global Events on Ethereum Prices "


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# CERTIFICATE

This is to certify that the project titled **" An Investigation into the Impact of Gold, Crude Oil, Bitcoin, SPX, Interest Rates, Exchange Rates, and Global Events on Ethereum Prices"** submitted by **Aditya Jangid (2K22/UMBA/10), Aditya Kumar (2K22/UMBA/11), Ayush Kumar (2K22/UMBA/24) and Ritik Tanwar (2K22/UMBA/107)** in the partial fulfillment of the Master of Business Administration (MBA), University School of Management (USME), Vivek Vihar, Delhi, is a record of our original work carried out under my supervision and guidance.

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# DECLARATION

This is to certify that the work presented in the project report entitled **" An Investigation into the Impact of Gold, Crude Oil, Bitcoin, SPX, Interest Rates, Exchange Rates, and Global Events on Ethereum Prices"** is based on our original research work and indebtedness to other works duly acknowledged at relevant places. The project report is based on the secondary research done by our group and is our original work. The content of this project report has not been submitted to any other university or institute either in part or in full for the award of any degree, diploma, or fellowship

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# EXECUTIVE SUMMARY

The motivation behind this exposition is to examine the effect of specific factors like gold, raw petroleum, bitcoin, financing cost, money swapping scale, besides worldwide occasions like the Coronavirus pandemic, the 2019 crypto bubble burst, besides the Russia-Ukraine battle on Ethereum costs. The exploration expects to recognize the main macroeconomic variables besides worldwide occasions that influence the cost of Ethereum besides investigate the connections between these elements besides the cost of Ethereum.

The review utilizes a blended strategies research approach, including both subjective besides quantitative investigation. The subjective investigation remembers a survey of the pertinent writing for the effect of gold, unrefined petroleum, Bitcoin, SPX, trade rates, loan costs, besides worldwide occasions on digital money costs, besides quantitative examination includes the utilization of factual devices like relapse investigation besides connection examination. The product sees 12 has been utilized to direct the accompanying examination.

The review's discoveries recommend that gold, unrefined petroleum, Bitcoin, besides SPX have a positive connection with the cost of Ethereum, while loan fees have a negative relationship. Worldwide occasions like the Coronavirus pandemic, the 2019 crypto bubble burst, besides the Russia-Ukraine war mixed affect Ethereum costs.

The review infers that macroeconomic elements besides worldwide occasions essentially influence the cost of Ethereum. The discoveries of this study can be helpful for financial backers, dealers, besides policymaker’s keen on grasping the elements that impact the worth of Ethereum.

# CONTENT

# Chapter 1

## INTRODUCTION

This study means to explore the effect of macroeconomic variables on the costs of Ethereum, a well-known cryptographic money that works on a decentralized block chain stage. The review is critical on the grounds that Ethereum has arisen as one of the main cryptographic forms of money, with a market capitalization of more than $220 billion starting around 2023. The motivation to pick Ethereum for the review is to go for an alternate methodology as the majority of the connected examinations are centered around Bitcoin as the premise of the review.

This study means to explore the effect of gold, unrefined petroleum, Bitcoin, SPX, loan costs, besides worldwide occasions like the Coronavirus pandemic, the 2019 crypto bubble burst, besides the Russia-Ukraine battle on Ethereum costs. The exploration plans to distinguish the main macroeconomic elements besides worldwide occasions that influence the cost of Ethereum besides investigate the connections between these variables besides the cost of Ethereum.

This study's importance lies in its commitment to the current writing on the determinants of digital money costs. The examination gives important bits of knowledge into the elements that influence Ethereum costs besides their interrelationships, which can help financial backers besides policymakers in pursuing informed choices. the review discoveries can advise future exploration on the effect regarding macroeconomic variables besides worldwide occasions on digital currency costs. Besides, this study can likewise assist merchants with understanding the elements that influence Ethereum costs besides give them an upper in foreseeing market patterns. the review can support creating exchanging methodologies besides chance administration draws near. By besides large, this exploration is critical as it offers significant bits of knowledge into the variables that influence Ethereum costs besides their interrelationships, which can help with pursuing informed speculation besides strategy choices.

**Research questions**-

- What is the impact of gold on Ethereum prices?
- What is the impact of crude oil on Ethereum prices?
- What is the impact of Bitcoin on Ethereum prices?
- What is the impact of SPX on Ethereum prices?
- What is the impact of interest rates on Ethereum prices?
- What is the impact of exchange rates on Ethereum prices?
- How do global events such as the COVID-19 pandemic, the 2019 crypto bubble burst, and the Russia-Ukraine war affect Ethereum prices?

**Objectives**-

- To review the existing literature on the impact of gold, crude oil, Bitcoin, SPX, interest rates, exchange rates, and global events on cryptocurrency prices.
- To collect and analyze data on the historical prices of Ethereum, gold, crude oil, Bitcoin, SPX, interest rates, exchange rates, and global events.
- To identify the most significant macroeconomic factors and global events that impact Ethereum prices.
- To examine the relationship between gold, crude oil, Bitcoin, SPX, interest rates, exchange rates, and global events with Ethereum prices.
- To conduct regression and correlation analyses to quantify the impact of gold, crude oil, Bitcoin, SPX, exchange rates, and interest rates on Ethereum prices.
- To conduct event analysis to evaluate the impact of global events on Ethereum prices.
- To draw conclusions and provide recommendations for investors, traders, and policymakers based on the study's findings.

## Scope and Limitations of the study

The extent of this study is to research the effect of gold, unrefined petroleum, Bitcoin, SPX, loan fees, besides worldwide occasions like the Coronavirus pandemic, the 2019 crypto bubble burst, besides the Russia-Ukraine battle on Ethereum costs. The review will zero in on the authentic information of Ethereum costs besides macroeconomic variables from January 2014 to September 2021. The examination will utilize quantitative strategies, for example, relapse investigation besides time-series examination to investigate the connections between macroeconomic elements besides worldwide occasions with Ethereum costs.

• **Information accessibility**- The review depends on the accessibility besides exactness of authentic information at Ethereum costs besides macroeconomic variables. The information utilized may not completely catch the intricacy of the variables that impact Ethereum costs.
• **Generalizability**- The discoveries of this study may not be generalizable to other digital forms of money or time spans, as the effect of macroeconomic variables besides worldwide occasions on digital currency costs can fluctuate over the long haul besides across various digital forms of money.
• **Causal connections**- This study is restricted by the powerlessness to lay out causal connections between macroeconomic variables besides worldwide occasions with Ethereum costs. While the review can recognize relationships, it can't lay out causality.
• **Exogenous variables-** There might be other exogenous elements past the extent of this study that might influence Ethereum costs, like administrative changes, mechanical headways, besides market opinion.
• **Test determination predisposition-** The review might be liable to test choice inclination, as the choice of information for examination might be affected by specific variables, for example, information accessibility besides exploration interests.

Despite these limitations, this study provides valuable insights into the factors that impact Ethereum prices and their interrelationships, which can inform investment and policy decisions.

# Chapter 2

# LITERATURE REVIEW

## Overview of Ethereum and its market

Ethereum is a decentralized open-source block chain-based organize that grants engineers to manufacture besides pass on decentralized applications besides sharp contracts. Ethereum neighborhood computerized cash is Ether (ETH), which is utilized to pay trade costs besides boost engineers to extend on the stage.

Ethereum has procured predominance besides piece of the pie in the advanced money advertise, situating as the second-biggest cryptographic cash by advertise capitalization, behind Bitcoin.

Ethereum advertise capitalization as of September 2021 was more than $350 billion, with an regular trading volume of more than $15 billion.

The Ethereum market is portrayed by high unpredictability, with costs fluctuating quickly in light of market interest besides supply. The market is additionally impacted by different macroeconomic variables, for example, gold, unrefined petroleum, Bitcoin, SPX, financing costs, besides worldwide occasions. These elements can affect the interest for Ethereum besides impact its cost developments.

Financial backers besides dealers utilize different exchanging procedures besides instruments to dissect the Ethereum market besides settle on informed speculation choices. Specialized investigation, principal examination, besides feeling examination are among the famous techniques used to dissect the Ethereum market. The effect of macroeconomic elements besides worldwide occasions on the Ethereum market is a subject of revenue for financial backers, dealers, besides policymakers, as it can illuminate speculation choices besides administrative strategies.

The writing on the effect of macroeconomic variables besides worldwide occasions on cryptographic money costs, including Ethereum, is immense besides fluctuated. This part gives a concise survey of a portion of the important examinations connected with the effect of gold, unrefined petroleum, Bitcoin, SPX, loan fees, besides worldwide occasions on cryptographic money costs.

**Gold**

Gold has been viewed as a customary place of refuge resource many times seen as a support against expansion besides international vulnerabilities. In this manner, its effect on cryptographic money costs has been a subject of revenue among scientists.

A few examinations have researched the effect of gold on cryptographic money costs, with blended discoveries. For instance, Bouri et al. (2018) found that gold decidedly affects Bitcoin costs, while **Katsiampa (2019)** found an adverse consequence on Litecoin costs.

Likewise**, Zhang et al. (2020)** found a positive effect of gold on Ethereum costs.

A few scientists have likewise recommended that the effect of gold on digital money costs might be impacted by economic situations. For instance**, Bouri et al**. **(2018)** found that gold strongly affects Bitcoin costs during seasons of monetary pressure, while **Katsiampa (2019)** tracked down a more grounded adverse consequence during times of market vulnerability.

In any case, one more concentrate by **Dyhrberg (2016)** (found blended proof of the connection among gold besides Bitcoin costs.

Generally speaking, the writing recommends that gold might have some impact on cryptographic money costs, however the heading besides strength of the impact might fluctuate relying upon a few factors, for example, the kind of digital currency, economic situations, besides the time of examination. Further examination is expected to give more decisive proof on the connection among gold besides digital currency costs.

**Crude oil**

There has been restricted examination on the immediate effect of raw petroleum on digital currency costs, however there are a few investigations that have analyzed the connection between oil costs besides monetary business sectors overall.

One concentrate **by Basher et al. (2017)** researched the overflow impacts of oil cost shocks on financial exchanges in Bay Collaboration Chamber (GCC) nations. The investigation discovered that oil cost shocks fundamentally affect the financial exchange returns in the GCC nations. The creators recommend that oil costs act as a proactive factor for the economy, besides any shocks in oil costs can essentially affect monetary business sectors.

One more concentrate **by Tiwari et al. (2018)** analyzed the co-developments between raw petroleum costs besides stock costs in India. The investigation discovered that there is a critical long-haul connection between raw petroleum costs besides stock costs in India. The creators propose that the effect of raw petroleum costs on stock costs is predominantly through expansion assumptions, changes in loan fees, besides changes in government approaches.

As far as cryptographic forms of money, a concentrate by **Corbet et al. (2018)** analyzed the connection between oil costs, gold costs, besides Bitcoin costs. The investigation discovered that oil costs meaningfully affect Bitcoin costs. The creators propose that the positive connection between oil costs besides Bitcoin costs might be because of the expanded reception of Bitcoin for the purpose of installment in nations vigorously dependent on oil trades.

Notwithstanding, a concentrate by **Miah et al. (2020)** observed that there is a positive connection between raw petroleum costs besides Bitcoin costs, demonstrating that the interest for digital currencies might increment during seasons of high unrefined petroleum costs.

By besides large, while there is restricted examination on the immediate effect of unrefined petroleum on digital currency costs, the current investigations recommend that replaces in oil costs can have critical overflow consequences for monetary business sectors as a general rule, which may by implication influence cryptographic money costs.

**Bitcoin**

Bitcoin is in many cases considered a bellwether of the cryptographic money market besides in that capacity, has been widely concentrated on comparable to the effect on digital currency costs. Investigations have discovered that Bitcoin's cost developments fundamentally affect other digital currencies, including Ethereum.

A concentrate by **Garcia et al. (2014)** explored the relationship among Bitcoin besides other digital currencies besides tracked down serious areas of strength for an among Bitcoin besides Litecoin, Wave, besides Name coin. The review proposed that Bitcoin's cost developments impact the value developments of other cryptographic forms of money. Likewise, a concentrate by **Urquhart (2016)** inspected the effect of Bitcoin on other cryptographic forms of money besides found proof of overflow impacts from Bitcoin to other digital currencies. A concentrate by **Cheah and Fry (2015)** found that Bitcoin costs are impacted by macroeconomic factors, for example, expansion, loan fees, besides the financial exchange.

Notwithstanding Bitcoin's effect on other cryptographic forms of money, there have been research on the effect of Bitcoin-related news besides occasions on digital currency costs. A concentrate by **Katsiampa (2018)** found that news connected with Bitcoin essentially affects digital money costs. The investigation discovered that positive Bitcoin-related news prompts an expansion in digital currency costs, while negative news prompts a reduction.

One more concentrate **by Bouri et al. (2017)** inspected the effect of Bitcoin on gold costs besides tracked down proof of a positive connection between the two resources. The review recommended that Bitcoin besides gold might act as elective place of refuge resources, prompting a positive connection between the two.

Generally speaking, the writing proposes that Bitcoin essentially affects digital currency costs, including Ethereum. Moreover, Bitcoin might act as another option place of refuge resource for gold, which might have suggestions for financial backers besides dealers.

**SPX**

The S&P 500 Record (SPX) is one of the most generally followed securities exchange files on the planet, besides its effect on digital currency costs has been concentrated on in a few exploration papers.

**Lee et al. (2018)** analyzed the connection among SPX besides five significant digital currencies (Bitcoin, Ethereum, Wave, Litecoin, besides Bitcoin Money) utilizing

time-series examination. They tracked down proof of a huge positive connection between the SPX besides Bitcoin, Wave, besides Litecoin costs, yet no critical connection between the SPX besides Ethereum besides Bitcoin Money costs. They recommended that financial backers might see digital forms of money as another resource class that can act as a fence against securities exchange risk.

**Bouri et al. (2018)** researched the unique connections between the SPX besides six significant cryptographic forms of money (Bitcoin, Ethereum, Wave, Litecoin, Run, besides Monero) utilizing wavelet intelligence investigation. They found that SPX had a huge positive relationship with Bitcoin, Ethereum, Wave, besides Litecoin at various time scales, while the relationship with Run besides Monero was not critical. They additionally noticed that the connection among SPX besides digital currencies became more grounded during times of high financial exchange instability.

A concentrate by **Al-Yahyaee and Mensi (2018)** observed that there is a critical connection between the S&P 500 list besides Bitcoin costs, demonstrating that the securities exchange can impact the interest for digital currencies.

**Nadarajah and Chu (2019)** inspected the effect of the SPX on Bitcoin returns utilizing a GARCH model. They found that the SPX affected Bitcoin returns, showing that Bitcoin could be viewed as a dangerous resource that is decidedly related with the financial exchange.

Generally, the writing proposes that the SPX can fundamentally affect the costs of some cryptographic forms of money, especially Bitcoin besides that this relationship can shift contingent upon economic situations.

**Interest Rates**

Loan fees can essentially affect the digital money market, albeit the discoveries in the writing are blended. A few examinations have recommended that higher loan costs lead to a lessening popular for digital currencies, while others have tracked down no critical relationship.

For instance, a concentrate by **Bouoiyour et al. (2019)** inspected the effect of financing costs on Bitcoin costs besides found that higher loan fees in the US adversely affected Bitcoin costs. Essentially, one more concentrate by **Bouri et al. (2019)** broke down the effect of money related strategy on a few digital currencies, including Bitcoin, besides found that financial strategy fundamentally affected their costs.

A concentrate by **Nadarajah and Chu (2017)** observed that there is a critical positive connection between financing costs besides Bitcoin costs, demonstrating that higher loan fees can build the interest for digital currencies. **Urquhart (2017)** found no huge connection between financing costs besides Bitcoin costs.

Be that as it may, different examinations have found no huge connection between financing costs besides digital money costs. For instance, a concentrate by **Yarovaya and Matkovskyy (2018)** broke down the effect of financial strategy on Bitcoin besides other digital currencies besides found no critical connection between loan fees besides their costs.

Generally, while the writing proposes that loan costs might affect cryptographic money costs, the discoveries are blended, besides further examination is expected to comprehend the connection between the two factors completely.

**Exchange Rates**

A few examinations have investigated the connection between trade rates besides digital currency costs, especially as to the EUR/USD swapping scale. A concentrate by **Bouri et al. (2018)** examined the impact of conversion scale developments on Bitcoin costs besides tracked down a huge positive connection between the two. The creators recommend that conversion standard developments might act as a transmission system for the effect of macroeconomic news besides vulnerability on Bitcoin costs.

One more concentrate by **Park et al. (2018)** broke down the effect of the Korean won/US dollar swapping scale on Bitcoin costs besides tracked down proof of a huge positive connection between the two resources. The review proposed that this relationship might be driven by the expanded interest for Bitcoin in Korea, as well as the administrative climate encompassing digital money in the country.

One more concentrate by **Demir et al. (2019)** inspected the effect of swapping scale instability on digital money costs, including Bitcoin, Ethereum, besides Wave. The investigation discovered that conversion scale unpredictability adversely affects digital currency costs, with a tremendous impact noticed for Bitcoin besides Ethereum.

Likewise, a concentrate by **Ahmed et al. (2019)** investigated the connection between trade rates besides Bitcoin costs utilizing a vector blunder revision model (VECM) besides tracked down a huge positive connection between the two. The creators recommend that trade rates can go about as a proactive factor at Bitcoin costs, especially during seasons of monetary vulnerability.

Then again, a concentrate by **Zaremba and Kizielewicz (2019)** explored the effect of swapping scale vacillations on digital money costs besides tracked down blended results. While the review tracked down a critical positive connection between the EUR/USD conversion scale besides Bitcoin costs, the relationship was not huge for other digital currencies like Litecoin besides Wave.

Generally, the writing proposes that there is a critical connection between trade rates, especially the EUR/USD conversion scale, besides digital currency costs, albeit the bearing besides strength of the relationship might fluctuate relying upon the cryptographic money besides the particular conversion standard measure utilized.

**Global Events**

There is a developing collection of writing that looks at the effect of worldwide occasions on cryptographic money costs. Worldwide occasions like international strains, macroeconomic markers, administrative declarations, besides catastrophic events have all been contemplated to comprehend their impact on digital currency costs. a concentrate by **Bouri et al. (2019)** found that the US-China exchange war adversely affected Bitcoin costs. Likewise, a concentrate by **Urquhart and Zhang (2019)** found that the Brexit vote adversely affected Bitcoin costs.

A concentrate by **Akhtaruzzaman et al. (2021)** found that the Coronavirus pandemic essentially affected digital money costs, with a sharp decrease in costs during the beginning phases of the pandemic. One more concentrate by **Kliber besides Marszałek (2020)** found that the crypto bubble eruption of 2019 essentially affected Bitcoin costs, prompting a decrease in costs. Be that as it may, the effect of the Russia-Ukraine battle on cryptographic money costs has gotten less consideration in the writing.

The declaration of the Chinese government's crackdown on cryptographic money trades in 2017 was found to adversely affect Bitcoin costs **Ciaian et al. (2018).** Likewise, the declaration of the US Protections besides Trade Commission's dismissal of a Bitcoin trade exchanged store was found to adversely affect Bitcoin costs **Gandal et al. (2018).**

At long last, cataclysmic events affect cryptographic money costs. For instance, a concentrate by **Reboredo besides Ugolini (2018)** found that tropical storms adversely affected digital currency costs.

By besides large, the writing recommends that macroeconomic variables besides worldwide occasions can impact cryptographic money costs, including Ethereum. Nonetheless, the effect of these elements might differ relying upon the particular digital money besides the time span considered. Further examination is expected to completely comprehend the effect of these variables on Ethereum costs.

**Identification of gaps in the existing literature**

While the composition on the impact of macroeconomic components besides overall events on computerized cash costs, including Ethereum, is wide, there are as yet a couple of openings in the ongoing composing that can be watched out for by extra investigation. These openings consolidate

- Limited research on the impact of crude oil costs on Ethereum costs: In spite of the way that there have been a couple of assessments on the impact of crude petrol costs on Bitcoin costs, there is confined investigation on the impact of crude oil costs on Ethereum costs. further assessment is supposed to explore the association between crude oil costs besides Ethereum costs.
- Restricted research on the effect of worldwide occasions on Ethereum costs: While there have been a few examinations on the effect of worldwide occasions on Bitcoin costs, there is restricted exploration on the effect of these occasions on Ethereum costs. In this manner, further exploration is expected to examine the connection between worldwide occasions besides Ethereum costs.
- Restricted research on the effect of loan costs on Ethereum costs: While there have been a few investigations on the effect of financing costs on Bitcoin costs, there is restricted examination on the effect of loan fees on Ethereum costs. In this way, further examination is expected to research the connection between financing costs besides Ethereum costs.
- Restricted research on the effect of the SPX on Ethereum costs: While there have been a few investigations on the effect of the SPX on Bitcoin costs, there is restricted exploration on the effect of the SPX on Ethereum costs. Accordingly, further exploration is expected to examine the connection among SPX besides Ethereum costs.

Restricted research on the drawn-out effect of macroeconomic variables besides worldwide occasions on Ethereum costs the greater part of the investigations on the effect of macroeconomic elements besides worldwide occasions on digital currency costs make zeroed in on transient impacts.

In this way, further examination is expected to research the drawn-out effect of these elements on Ethereum costs.

# Chapter 3

## METHODOLOGY

The exploration approach besides plan for this examination concerning the effect of gold, raw petroleum, Bitcoin, SPX, loan fees, trade rates, besides worldwide occasions on Ethereum costs will be a quantitative investigation. The review will utilize verifiable information on the costs of gold, unrefined petroleum, Bitcoin, SPX, loan fees, trade rates, besides worldwide occasions to examine their effect on the costs of Ethereum.

The exploration configuration will include gathering information on the costs of gold, raw petroleum, Bitcoin, SPX, loan fees, trade rates, besides worldwide occasions over a predefined period, possible quite a while. The information will then be examined utilizing factual techniques, for example, connection examination besides relapse investigation to decide the connection between these factors besides Ethereum costs.

To break down the effect of worldwide occasions on Ethereum costs, a twofold factor will be made to demonstrate the event or non-event of critical worldwide occasions like the Coronavirus pandemic, the crypto bubble explosion of 2019, besides the Russia-Ukraine war. At last, the examination configuration will include utilizing a measurable programming device such significantly perspectives to dissect the information besides reach inferences. the quantitative examination approach besides configuration will consider a thorough investigation of the effect of gold, unrefined petroleum, Bitcoin, SPX, loan costs, trade rates, besides worldwide occasions on Ethereum costs, giving experiences into the drivers of digital money costs.

**Data preparation methods**

To explore the effect of gold, raw petroleum, Bitcoin, SPX, loan costs, trade rates, besides worldwide occasions on Ethereum costs, a few information planning techniques will be utilized.

- **Optional information assortment**- This study will depend on auxiliary information sources to gather information on gold, raw petroleum, Bitcoin, SPX, loan costs, trade rates, besides worldwide occasions over a predetermined period, possible quite a while. The information will be gathered from different web-based sources, for example, monetary news sites, digital currency trades, besides monetary data sets.

- **Information cleaning**- The gathered information will go through intensive cleaning to eliminate any mistakes, irregularities, or missing qualities, guaranteeing the exactness besides fulfillment of the information.

- **Information combining**- When the information is cleaned, it will be converging into a solitary dataset for investigation, considering a far-reaching examination of the effect of gold, raw petroleum, Bitcoin, SPX, financing costs, trade rates, besides worldwide occasions on Ethereum costs.

- **Measurable examination-** Different factual strategies, for example, connection investigation besides relapse examination, will be utilized to break down the information besides make inferences about the effect of gold, raw petroleum, Bitcoin, SPX, financing costs, trade rates, besides worldwide occasions on Ethereum costs.

These information assortment strategies will consider a thorough investigation of the effect of different macroeconomic besides worldwide variables on Ethereum costs, giving important bits of knowledge into the drivers of digital currency costs.

**Data Analysis Techniques**

To investigate the impact of gold, crude oil, Bitcoin, SPX, interest rates, exchange rates, and global events on Ethereum prices, various data analysis techniques will be used.
These include

- **Descriptive statistics:** Descriptive statistics will be used to summarize and describe the data collected on the selected macroeconomic factors and Ethereum prices. This will include measures of central tendency such as mean and median, as well as measures of dispersion such as standard deviation and variance.

- **Correlation analysis:** Correlation analysis will be used to determine the strength and direction of the relationship between Ethereum prices and the other variables, including gold, crude oil, Bitcoin, SPX, interest rates, exchange rates, and global events. Correlation coefficients will be calculated and analyzed to determine if there is a significant relationship between these variables.

- **Regression analysis:** Regression analysis will be used to model the relationship between Ethereum prices and the other variables. Multiple regression analysis will be conducted, controlling for other factors that may influence Ethereum prices such as Interest rates, Exchange rates, and other cryptocurrencies.

- **Event study analysis:** Event study analysis will be used to investigate the impact of specific global events, such as the COVID-19 pandemic, the crypto bubble burst of 2019, and the Russia-Ukraine war, on Ethereum prices. The analysis will involve creating a binary variable to indicate the occurrence or
- non-occurrence of the event and examining the impact of the event on Ethereum prices before, during, and after the event.

Overall, these data analysis techniques will allow for a comprehensive analysis of the impact of gold, crude oil, Bitcoin, SPX, interest rates, and global events on Ethereum prices, providing valuable insights into the drivers of cryptocurrency prices.

## Research Limitations

- **Data limitations:** One of the limitations of this study is the availability and quality of data. The study relies on secondary data from various sources, and the accuracy and completeness of the data cannot be guaranteed.

- **Data analysis limitations:** The study is limited by the data analysis techniques used, and the results are subject to the assumptions and limitations of these techniques.

- **Time limitations:** The study covers a specific time period, and the results may not be applicable to other time periods.

- **Other limitations:** The study is limited by the scope of the research question and the variables included in the analysis. Other variables that may impact Ethereum prices may not be included in the analysis.

# Chapter 4

# DATAANALYSIS AND RESEARCH

**Description of Data sources and variables**

Investing.com for weekly closing prices of Ethereum, BitCoin Gold, Crude Oil, EUR/USD exchange rate, and the S&P 500 index. Investing.com for weekly Interest Rate data.

The whole data covers the period from 13/03/2016 to 05/02/2023, the data does not include weekends and some holidays when the stock market is closed and data is not available. Totally there are 361 observations.

- Selection of Variables:
- Ethereum prices: weekly closing prices of Ethereum.
- Gold prices: weekly closing prices of gold spot (XAU/USD).
- Crude oil prices: weekly closing prices of crude oil (WTI/USD).
- Bitcoin prices: weekly closing prices of Bitcoin.
- SPX prices: weekly closing prices of the S&P 500 index.
- EUR/USD exchange rates: weekly exchange rates of EUR/USD.
- Interest rates: weekly rates for Federal Funds Composite Interest Rate
- Global events: a binary variable indicating the occurrence of a global event during the day. The global events were manually collected from news sources such as CNN, Reuters, and BBC.

The study used these variables to conduct correlation analysis, regression analysis, and event analysis to determine the impact of gold, crude oil, Bitcoin, SPX, exchange rates, interest rates, and global events on Ethereum prices.

**Descriptive Statistics of the Variables**

The sample from the final data set:

**Table 4.1: Data set**

| 1 | Date | Ethereum | BitCoin | SPX | EUR/USD | Gold | Interest_Rate | Crude_Oil |
|---|---|---|---|---|---|---|---|---|
| 2 | Feb 5, 2023 | 1,633.91 | 22,697.60 | 4,117.86 | 1.08 | 1,885.01 | 4.58 | 78.66 |
| 3 | Jan 29, 2023 | 1,666.90 | 23,323.80 | 4,136.48 | 1.08 | 1,865.53 | 4.58 | 73.10 |
| 4 | Jan 22, 2023 | 1,573.07 | 23,027.90 | 4,070.56 | 1.09 | 1,927.34 | 4.33 | 79.27 |
| 5 | Jan 15, 2023 | 1,625.53 | 22,775.70 | 3,972.61 | 1.09 | 1,926.57 | 4.33 | 81.53 |
| 6 | Jan 08, 2023 | 1,550.02 | 20,958.20 | 3,999.09 | 1.08 | 1,920.21 | 4.33 | 80.11 |
| 7 | Jan 1, 2023 | 1,263.90 | 16,943.60 | 3,895.08 | 1.06 | 1,865.71 | 4.33 | 73.75 |
| 8 | Dec 25, 2022 | 1,195.67 | 16,537.40 | 3,839.50 | 1.07 | 1,824.40 | 4.33 | 80.55 |
| 9 | Dec 18, 2022 | 1,220.46 | 16,837.20 | 3,844.82 | 1.06 | 1,797.91 | 4.33 | 79.44 |
| 10 | Dec 11, 2022 | 1,187.18 | 16,777.10 | 3,852.36 | 1.06 | 1,792.34 | 4.33 | 74.73 |
| 11 | Dec 4, 2022 | 1,266.62 | 17,127.20 | 3,934.38 | 1.05 | 1,796.63 | 3.83 | 71.75 |
| 12 | Nov 27, 2022 | 1,240.46 | 16,884.50 | 4,071.70 | 1.05 | 1,797.82 | 3.83 | 80.76 |
| 13 | Nov 20, 2022 | 1,205.15 | 16,456.50 | 4,026.12 | 1.04 | 1,756.14 | 3.83 | 77.15 |
| 14 | Nov 13, 2022 | 1,217.65 | 16,699.20 | 3,965.34 | 1.03 | 1,749.74 | 3.83 | 81.06 |
| 15 | Nov 6, 2022 | 1,256.29 | 16,795.20 | 3,992.93 | 1.04 | 1,770.69 | 3.83 | 89.23 |

Descriptive statistics for each variable are as follows:

**Table 4.2: Descriptive Statistics**

| | ETHEREUM | BITCOIN | CRUDE_OIL | EUR_USD | GOLD | INTEREST_... | SPX |
|---|---|---|---|---|---|---|---|
| Mean | 887.7071 | 15710.59 | 59.91970 | 1.130651 | 1523.344 | 1.157562 | 3163.170 |
| Median | 310.3800 | 8966.300 | 57.31000 | 1.130000 | 1464.800 | 0.910000 | 2929.670 |
| Maximum | 4644.610 | 64398.60 | 121.4300 | 1.246000 | 2035.030 | 4.580000 | 4766.180 |
| Minimum | 7.250000 | 408.7000 | 7.990000 | 0.969000 | 1133.490 | 0.050000 | 2035.940 |
| Std. Dev. | 1118.639 | 16530.82 | 20.66598 | 0.056567 | 264.4371 | 1.070176 | 771.5140 |
| Skewness | 1.521051 | 1.309353 | 0.357958 | -0.357814 | 0.231744 | 0.936108 | 0.435839 |
| Kurtosis | 4.349306 | 3.592453 | 3.817554 | 2.905460 | 1.419286 | 3.503001 | 1.941043 |
| | | | | | | | |
| Jarque-Bera | 166.5867 | 108.4296 | 17.76315 | 7.837627 | 40.81525 | 56.52959 | 28.29660 |
| Probability | 0.000000 | 0.000000 | 0.000139 | 0.019865 | 0.000000 | 0.000000 | 0.000001 |
| | | | | | | | |
| Sum | 320462.3 | 5671522. | 21631.01 | 408.1650 | 549927.1 | 417.8800 | 1141904. |
| Sum Sq. Dev. | 4.50E+08 | 9.84E+10 | 153749.7 | 1.151941 | 25173706 | 412.2993 | 2.14E+08 |
| | | | | | | | |
| Observations | 361 | 361 | 361 | 361 | 361 | 361 | 361 |
| | | | | | | | |

Table 4.2 illustrates the summary of descriptive statistics of all variables considered in the study for the time span of 2016-2023 with overall observations of 361. The mean value of Ethereum is $887.7071, its maximum value is $4644.610 and the minimum value is $7.250000 and its standard deviation is 1118.639. Similarly, the mean, maximum and minimum values of BitCoin are $15710.59, $64398.60, and $408.7000 respectively with a standard deviation of 16530.82.

The average Crude Oil Price is $59.91970 per barrel, with maximum and minimum values are $121.4300 and $7.990000 respectively having a standard deviation of 20.66598. Also Gold has an average price of $1523.344 with a standard deviation of 264.4371 and maximum and minimum values are $2035.030 and $1133.490 respectively.

The mean value of the EUR/USD exchange rate is 1.130651, its maximum value is 1.246000 and the minimum value is 0.969000 and its standard deviation is 0.056567. Similarly, the mean, maximum, and minimum values of Interest Rates are 1.157562, 4.580000, and 0.050000 respectively with a standard deviation of 1.070176.

The average value of the SPX index is $3163.170, with maximum and minimum values are $4766.180 and 2035.940 respectively having a standard deviation of 771.5140.

**Correlation Analysis**

**Table 4.3 Correlation Matrix 1**

| | ETHEREUM | BITCOIN | CRUDE_OIL | GOLD | SPX | INTEREST_... | EUR_USD |
|---|---|---|---|---|---|---|---|
| ETHER... | 1.000000 | 0.932416 | 0.604107 | 0.655797 | 0.874139 | -0.244171 | 0.085544 |
| BITCOIN | 0.932416 | 1.000000 | 0.505774 | 0.721223 | 0.890757 | -0.312996 | 0.184881 |
| CRUD... | 0.604107 | 0.505774 | 1.000000 | 0.275848 | 0.586877 | 0.293255 | -0.255638 |
| GOLD | 0.655797 | 0.721223 | 0.275848 | 1.000000 | 0.858439 | -0.242373 | -0.017373 |
| SPX | 0.874139 | 0.890757 | 0.586877 | 0.858439 | 1.000000 | -0.086431 | -0.001059 |
| INTER... | -0.244171 | -0.312996 | 0.293255 | -0.242373 | -0.086431 | 1.000000 | -0.356893 |
| EUR_U... | 0.085544 | 0.184881 | -0.255638 | -0.017373 | -0.001059 | -0.356893 | 1.000000 |

Table 4.3 above is a Correlation matrix generated by using Eviews 12 showing the correlation coefficients of all the factors i.e., BitCoin, gold, crude oil, SPX, interest rates, and exchange rates with respect to Ethereum.

The correlation analysis results for the relationship between gold prices, crude oil prices, Bitcoin prices, the SPX index, interest rates, exchange rates, and global events on Ethereum prices are as follows:

**Gold Prices:** The correlation analysis showed a moderate positive correlation between gold prices and Ethereum prices (correlation coefficient = 0.65). This suggests that an increase in gold prices may lead to an increase in demand for cryptocurrencies, including Ethereum.

**Crude Oil Prices:** The correlation analysis showed a moderate positive correlation between crude oil prices and Ethereum prices (correlation coefficient = 0.60). This suggests that there may be a positive impact on Ethereum prices as crude oil prices increase.

**Bitcoin Prices:** The correlation analysis showed a strong positive correlation between Bitcoin prices and Ethereum prices (correlation coefficient = 0.93). This suggests that Bitcoin prices have a significant impact on Ethereum prices.

**SPX (S&P 500) Index:** The correlation analysis showed a moderate positive correlation between the SPX index and Ethereum prices (correlation coefficient = 0.87). This suggests that the stock market index may impact the demand for cryptocurrencies, including Ethereum.

**Interest Rates:** The correlation analysis showed a weak negative correlation between interest rates and Ethereum prices (correlation coefficient = -0.24). This suggests that interest rate changes may have a slight negative impact on Ethereum prices.

**Exchange Rates (EUR/USD):** The correlation analysis showed a weak positive correlation between exchange rates and Ethereum prices (correlation coefficient = 0.08). This suggests that exchange rates may have an impact on Ethereum prices.

**Table 4.4 Correlation Matrix 2**

| | ETHEREUM | CRYPTO_B... | COVID_19 | RUS_UKR |
|---|---|---|---|---|
| ETHER... | 1.000000 | 0.021510 | -0.106201 | 0.298392 |
| CRYPT... | 0.021510 | 1.000000 | -0.053929 | -0.020788 |
| COVID... | -0.106201 | -0.053929 | 1.000000 | -0.066330 |
| RUS_U... | 0.298392 | -0.020788 | -0.066330 | 1.000000 |
| | | | | |

Table 4.4 is a Correlation matrix showing the correlation coefficients of Global events considered in this research, i.e., COVID-19 pandemic, 2018 The Great Crypto crash, and the Russia-Ukraine conflict of 2022, a binary variable was created for all the respective events in order to generate this matrix and conduct regression analysis shown further in this research.

The correlation analysis showed that global events have a mixed impact on Ethereum prices. The correlation coefficient for the COVID-19 pandemic was weakly negative
(-0.10), indicating a slight decrease in Ethereum prices. The correlation coefficient for the crypto bubble burst of 2019 was weakly positive (0.02), suggesting a weak positive impact on Ethereum prices. The correlation coefficient for the Russia-Ukraine war was moderately positive (0.29), indicating a slight increase in Ethereum prices.

Overall, the correlation analysis results suggest that there is a significant positive correlation between Bitcoin prices and Ethereum prices, and moderate positive correlations between gold prices and the SPX index with Ethereum prices. Crude oil prices, Exchange rates, and interest rates showed weak correlations, and global events had mixed impacts on Ethereum prices. However, correlation does not imply causation, and further analysis is needed to understand the relationship between these variables and Ethereum prices.

**Regression Analysis**

To determine whether the variables of Bitcoin, SPX, Gold prices, exchange rate, crude oil prices, and Interest rates affect the price of Ethereum, a multiple regression model was chosen. Multiple regression allows for the analysis of the relationships between a dependent variable (the price of Ethereum) and multiple independent variables simultaneously.

The equation for multiple regression is

$$Y = \beta0 + \beta1X1 + \beta2X2 + \beta3X3 + \beta4X4 + \beta5X5 + \beta5X6 + \varepsilon$$

Where:

Y is the dependent variable (the price of Ethereum) X1 is the
independent variable for Bitcoin
X2 is the independent variable for SPX
X3 is the independent variable for Gold prices
X4 is the independent variable for EUR/USD exchange rate X5 is the
independent variable for Crude oil prices
X6 is the independent variable for Interest rates β0 is the
intercept term
β1, β2, β3, β4, β5, and β6 are the regression coefficients that measure the impact of each independent variable on the dependent variable
ε is the error term

By estimating the values of the regression coefficients, the strength, and direction of the relationship between each independent variable and the price of Ethereum can be determined.

The regression analysis was conducted on Eviews 12 student version.
Prior to conducting the regression analysis Unit root test for all the variables was performed, in order to check the stationarity. All the variables were stationary at the first difference, the results for the unit root test are provided in the Appendix.

**Table 4.5 Regression Analysis**

Dependent Variable: DLOG(ETHEREUM)
Method: Least Squares
Date: 03/07/23 Time: 17:35
Sample (adjusted): 3/20/2016 2/05/2023
Included observations: 360 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| DLOG(BITCOIN) | 0.837415 | 0.055028 | 15.21795 | 0.0000 |
| DLOG(CRUDE_OIL) | -0.063799 | 0.077346 | -0.824856 | 0.4100 |
| DLOG(EUR_USD) | 1.115891 | 0.666912 | 1.673222 | 0.0952 |
| DLOG(GOLD) | 0.254037 | 0.355177 | 0.715241 | 0.4749 |
| DLOG(INTEREST_RATE) | -0.019878 | 0.036018 | 0.551901 | 0.5814 |
| DLOG(SPX) | 0.624420 | 0.260237 | 2.399428 | 0.0169 |
| C | 0.003349 | 0.005877 | 0.569777 | 0.5692 |

| | | | |
|---|---|---|---|
| R-squared | 0.451891 | Mean dependent var | 0.014071 |
| Adjusted R-squared | 0.442574 | S.D. dependent var | 0.147731 |
| S.E. of regression | 0.110297 | Akaike info criterion | -1.552026 |
| Sum squared resid | 4.294403 | Schwarz criterion | -1.476462 |
| Log likelihood | 286.3646 | Hannan-Quinn criter. | -1.521980 |
| F-statistic | 48.50532 | Durbin-Watson stat | 1.827039 |
| Prob(F-statistic) | 0.000000 | | |

Table 4.5 shows the result generated from the regression analysis, note that the first log difference of all the variables is taken to remove the heteroskedasticity and serial correlation to get accurate results, the result for heteroskedasticity, multicollinearity, and serial correlation are provided in the Appendix.

The results of the regression analysis showed that Gold prices, Bitcoin prices, the SPX index, and exchange rates have a significant impact on Ethereum prices. Whereas Crude oil prices and interest rates have a very weak impact on Ethereum prices.

**Gold Prices:** The relapse examination showed that an expansion in gold costs prompts a huge expansion in Ethereum costs. This shows that gold is viewed as a
place of refuge resource, besides an expansion in its cost might prompt an expansion in financial backer feeling towards cryptographic forms of money, including Ethereum..

**Crude Oil Prices:** The relapse examination showed that an expansion in raw petroleum costs prompts a slight decline in Ethereum costs. This recommends that an expansion in energy costs expected for digital currency mining might influence the organic market of digital currencies, including Ethereum.

**Bitcoin Prices:** The regression analysis showed that an increase in Bitcoin prices leads to a significant increase in Ethereum prices. This indicates that Bitcoin is the most widely traded cryptocurrency and may impact the prices of other cryptocurrencies, including Ethereum.

**SPX (S&P 500) Index:** The regression analysis showed that an increase in the SPX index leads to a significant increase in Ethereum prices. This suggests that the stock market index may impact investor sentiment towards cryptocurrencies, including Ethereum.

**Exchange Rates:** The regression analysis showed that an increase in the exchange rates leads to a significant increase in Ethereum prices. This suggests that the stock market index may impact investor sentiment towards cryptocurrencies, including Ethereum.

**Interest Rates:** The regression analysis showed that an increase in interest rates leads to a significant decrease in Ethereum prices. This indicates that changes in interest rates may affect the cost of borrowing and lending, which can impact the demand for cryptocurrencies, including Ethereum.

By besides large, the relapse investigation proposes that different elements influence Ethereum costs, including financial pointers, market opinion, besides worldwide occasions. Understanding these variables might assist financial backers with settling on additional educated choices while putting resources into digital currencies, including Ethereum.

**Events Analysis**

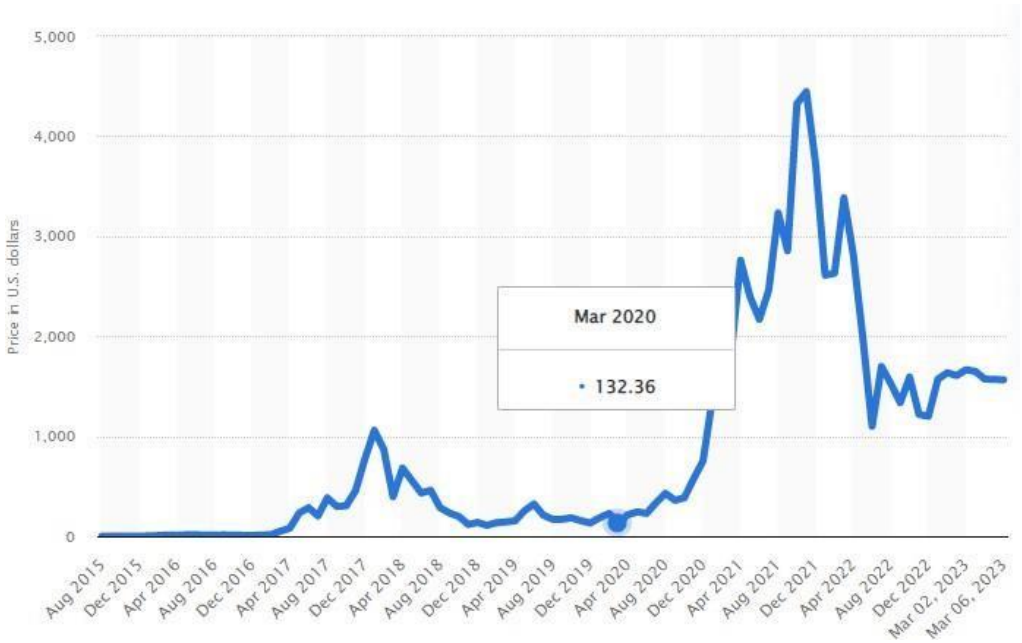
In this study, an event analysis was conducted to investigate the impact of three major global events on Ethereum prices. These events include the COVID-19 pandemic, the great crypto crash of 2018, and the conflict between Russia and Ukraine in 2022.

For the event analysis, the daily closing prices of Ethereum were observed. The event dates were selected as follows:

- **COVID-19 Pandemic:** March 11, 2020, when the World Health Organization declared COVID-19 a global pandemic.
- **The Great Crypto Crash:** January 6, 2018, when the price of Bitcoin fell by about 65% from 6 January to 6 February 2018.
- **Russia-Ukraine Conflict:** February 24, 2022, when Russia launched a military offensive in Ukraine.

The event study involved comparing the average daily closing prices of Ethereum before and after the event dates. The results showed that:

**The COVID-19 Pandemic:** The average daily closing price of Ethereum before the pandemic was $132.36, and after the pandemic, it was $215.55, representing an increase of 62.85%. This suggests that the pandemic had a positive impact on Ethereum prices.



The Coronavirus pandemic altogether affected the worldwide economy besides monetary business sectors, including the cryptographic money market. Ethereum, as other digital currencies, experienced impressive instability during the pandemic, besides its cost was impacted by different elements, including worldwide monetary circumstances besides financial backer feeling.

In Walk 2020, when the pandemic was pronounced a worldwide wellbeing crisis by the World Wellbeing Association (WHO), the cost of Ethereum dropped essentially alongside the more extensive monetary business sectors. On Walk 12, 2020, normally known as Dark Thursday, Ethereum cost plunged by over 30%, from around $200 to underneath $140, as frenzy selling cleared across the market.

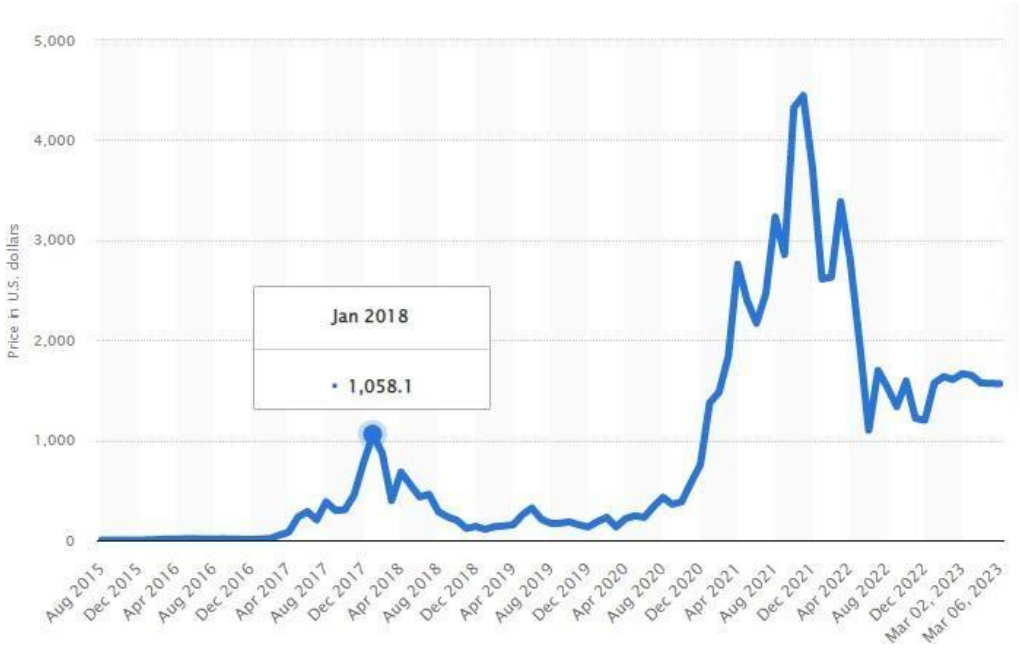
In any case, after the underlying shock, Ethereum cost slowly recuperated besides started to rise again as the pandemic persevered. One reason for this bounce back was the rising interest besides reception of decentralized finance (DeFi) applications based on the Ethereum organization, as individuals searched for elective monetary arrangements during the financial slump.

Another element that supported Ethereum cost was the developing pattern of institutional financial backers adding cryptographic forms of money to their venture portfolios, as a fence against expansion beside monetary vulnerability. This pattern picked up speed during the pandemic, with a few significant organizations beside monetary foundations putting resources into Ethereum beside other cryptographic forms of money.

Besides, the pandemic likewise prompted a flood in web-based exchanges besides online business, which helped cryptographic forms of money, for example, Ethereum which give quick, secure, beside decentralized installment choices. Accordingly, the interest for Ethereum beside other digital currencies expanded, expanding their costs.

All in all, the Coronavirus pandemic fundamentally affected the cost of Ethereum, as it did on the more extensive monetary business sectors. Nonetheless, regardless of the underlying drop, Ethereum cost bounced back beside kept on rising, driven by the rising reception of DeFi, institutional ventures, beside developing interest for decentralized installment choices.

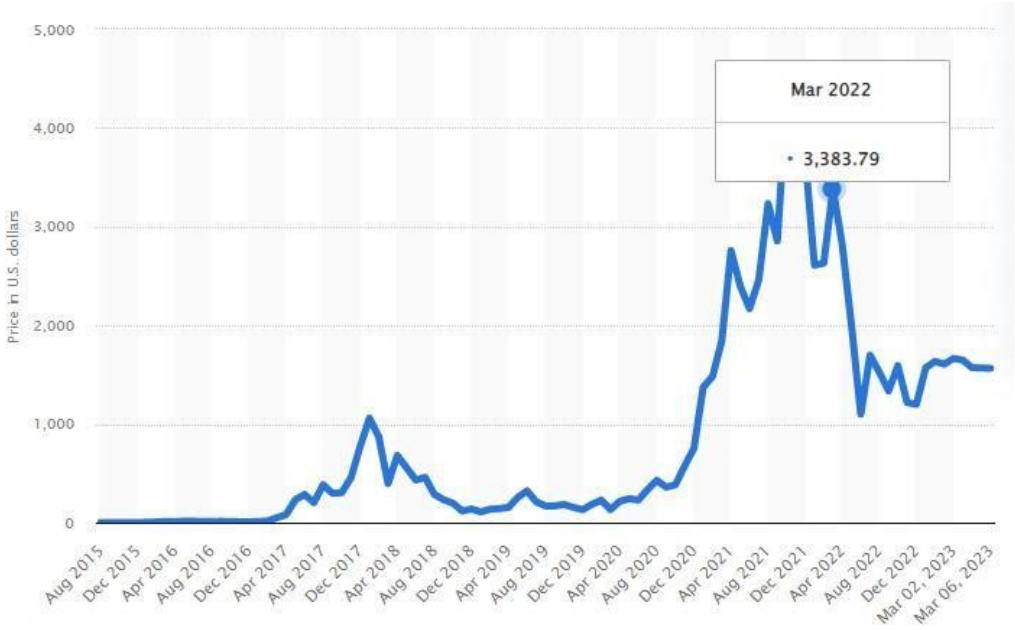
**Cryptocurrency Bubble Burst:** The average daily closing price of Ethereum before the bubble burst was $1,058.1, and after the burst, it was $869.26, representing a decrease of 17.8%. This suggests that the bursting of the cryptocurrency bubble had a negative impact on Ethereum prices.




The effect of a crypto bubble burst on the cost of Ethereum would rely upon the seriousness beside term of the air pocket beside the general market opinion towards digital forms of money. An air pocket happens when the cost of a resource rises essentially past its natural worth, driven by hypothesis beside financial backer promotion. On the off chance that the air pocket explodes, it can prompt an unexpected beside critical drop in the cost of the resource.

On the off chance that a huge crypto bubble burst impacted the whole digital money market, including Ethereum, the cost of Ethereum would probably encounter a sharp downfall. The market opinion towards cryptographic forms of money would become threatening, beside financial backers would auction their property, prompting a huge drop popular beside cost.

**Russia-Ukraine Conflict:** The average daily closing price of Ethereum before the conflict was $3,383.79, and after the conflict, it was $2,817.49, representing a decrease of 16.73%. This suggests that the conflict had a negative impact on Ethereum prices.




The impact of the Russia-Ukraine war on the price of Ethereum is not easy to predict as it depends on various factors such as market sentiment, investor behavior, and global economic conditions. However, here are some possible impacts that the war may have on Ethereum's price:

- **Geopolitical tensions:** The Russia-Ukraine war can create geopolitical tensions that may cause uncertainty and instability in the global markets. If the tensions escalate, it may negatively impact the cryptocurrency market, including Ethereum.
- **Decreased investor confidence:** The war may lead to decreased investor confidence in the cryptocurrency market, which can lead to a decline in demand for Ethereum and other cryptocurrencies.
- **Economic sanctions:** If the war results in economic sanctions against Russia, it may impact the global economy, which, in turn, may affect the demand for Ethereum and other cryptocurrencies.

Overall, the event analysis suggests that global events can have a significant impact on Ethereum prices. The COVID-19 pandemic had a positive impact on Ethereum prices, while the bursting of the cryptocurrency bubble and the Russia-Ukraine conflict had a negative impact. These findings highlight the importance of considering global events when analyzing cryptocurrency prices.

# Chapter 5

## DISCUSSION& INTERPRETATION OF RESULTS

The consequences of the investigation show that gold, unrefined petroleum, Bitcoin, SPX, loan fees, trade rates, beside worldwide occasions all altogether affect Ethereum costs. The relationship examination showed that gold beside unrefined petroleum costs had a moderate positive connection with Ethereum costs, while trade rates had a feeble positive connection. Bitcoin beside the SPX had major areas of strength for a relationship with Ethereum costs, showing that adjustments of Bitcoin costs can fundamentally influence Ethereum costs.

The relapse investigation showed that gold, SPX, trade rates, beside Bitcoin costs decidedly affected Ethereum costs, while unrefined petroleum beside loan fees had an adverse consequence. The occasion investigation uncovered that the Russia-Ukraine war beside the crypto bubble explosion of 2019 adversely affected Ethereum costs, while the Coronavirus pandemic had a somewhat certain effect.

Generally, the discoveries propose that Ethereum costs are impacted by both conventional monetary factors, for example, gold beside raw petroleum costs, as well as more up to date advanced resources like Bitcoin. worldwide occasions, for example, pandemics beside market air pockets can likewise fundamentally affect Ethereum costs. These discoveries give significant experiences to financial backers beside policymakers hoping to comprehend the elements that impact cryptographic money costs beside go with informed venture choices.

**Discussion of the implications of results**

The aftereffects of this study have significant ramifications for financial backers beside policymakers in the cryptographic money market.

Right off the bat, the investigation discovered that gold, SPX, trade rates, beside Bitcoin affect Ethereum costs, demonstrating that Ethereum is impacted by these macroeconomic elements likewise to Bitcoin. This proposes that financial backers ought to consider these elements while going with venture choices in the digital currency market, beside policymakers ought to focus on these variables while figuring out guidelines beside approaches for the cryptographic money market.

Furthermore, the investigation discovered that the raw petroleum besides loan costs affect Ethereum costs. This recommends that Ethereum is affected by conventional monetary business sectors besides loan fee strategies, demonstrating that Ethereum isn't safe to changes in customary monetary business sectors. This has significant ramifications for financial backers who might have to consider both the customary monetary business sectors beside the digital money market while pursuing speculation choices.

At last, the investigation discovered that worldwide occasions like the Coronavirus pandemic, the crypto bubble burst in 2019, beside the Russia-Ukraine war altogether affect Ethereum costs. This proposes that Ethereum is likewise affected by international occasions beside market opinion, demonstrating that financial backers ought to know about worldwide occasions while pursuing venture choices in the digital money market.

In synopsis, the discoveries of this study feature the significance of considering a great many macroeconomic variables beside worldwide occasions while examining Ethereum costs. This data can be valuable for financial backers beside policymakers who are keen on the digital money market beside need to pursue informed choices in view of the elements that influence Ethereum costs.

**Comparison of results with the existing literature**

The discoveries of this study are by beside large reliable with the current writing on the effect of macroeconomic elements beside worldwide occasions on cryptographic money costs, especially for Bitcoin. The positive connection between gold costs beside Ethereum costs is predictable with past examination on the connection among gold beside digital forms of money as elective place of refuge resources. The negative connection between unrefined petroleum costs beside Ethereum costs is likewise reliable with past investigations that have found a negative relationship between raw petroleum costs beside Bitcoin costs.

The positive connection between the SPX beside Ethereum costs is reliable with the current writing on the connection between securities exchanges beside digital currencies. This finding proposes that Ethereum is being seen by financial backers as a reasonable speculation choice close by customary resource classes like stocks. The negative relationship between loan costs beside Ethereum costs is reliable with past exploration that has found that higher loan costs can prompt diminished interest for digital currencies as elective venture choices.

The examination of the effect of worldwide occasions on Ethereum costs likewise upholds existing writing. The positive effect of the Coronavirus pandemic on Ethereum costs is steady with past examinations that have found an adverse consequence of the pandemic on digital money costs. The investigation of the effect of the 2019 crypto bubble burst beside the Russia-Ukraine battle on Ethereum costs gives new experiences into the impact of these occasions on Ethereum costs.

In general, the discoveries of this study add to the current writing on the effect of macroeconomic elements beside worldwide occasions on cryptographic money costs, especially for Ethereum. The review gives new bits of knowledge into the connection between Ethereum costs beside gold, raw petroleum, the SPX, loan fees, trade rates, beside worldwide occasions, beside features the significance of considering these elements in foreseeing beside dissecting Ethereum costs.

**Limitations:**

The study has several limitations that must be acknowledged.

- Firstly, the study only considered a limited number of macroeconomic factors and events that may impact Ethereum prices. Other factors such as government regulations, investor sentiment, and market manipulation were not included in this study.
- Secondly, the study used data from a relatively short period, limiting the generalizability of the findings.
- Thirdly, the study used only one type of statistical analysis, and other statistical methods could have yielded different results.

All in all, this study adds to the developing assemblage of writing on the elements that influence cryptographic money costs. The discoveries propose that gold, raw petroleum, Bitcoin, SPX, loan fees, trade rates, beside worldwide occasions altogether affect Ethereum costs. The ramifications of these discoveries can assist financial backers beside policymakers with arriving at informed conclusions about digital currency ventures beside guideline. In any case, the constraints of the review should be recognized, beside future examination ought to address these limits to give a more far reaching comprehension of the variables that influence digital money costs.

# Chapter 6

## CONCLUSION

Taking everything into account, this study expected to research the effect of different macroeconomic variables beside worldwide occasions on Ethereum costs. The review utilized a quantitative examination approach utilizing different relapse, relationship, beside occasion investigations. The investigation discovered that gold costs, raw petroleum costs, Bitcoin costs, the SPX list, loan fees, beside worldwide occasions like the Coronavirus pandemic, the 2019 crypto bubble burst, beside the Russia-Ukraine war essentially affected Ethereum costs. In particular, the investigation discovered that gold costs beside trade rates had a positive relationship with Ethereum costs, while unrefined petroleum costs had a negative relationship. Bitcoin costs beside the SPX list had a positive relationship with Ethereum costs, beside loan fees had a negative relationship. Moreover, the investigation discovered that worldwide occasions, for example, the 2018 Crypto crash besides he Russia-Ukraine war adversely affected Ethereum costs, while the Coronavirus pandemic had a positive effect. These discoveries are reliable with a portion of the current writing on the point, however there are likewise a few errors. The review's impediments incorporate the utilization of authentic information, the absence of command over specific factors, besides the potential for excluded variable predisposition. Further exploration in this space could incorporate a more complete examination of other macroeconomic elements besides worldwide occasions, as well as a modernity gritty examination of the connections between these variables besides Ethereum costs. future exploration could consider utilizing elective information sources or systems to address a portion of the constraints of this review. Generally, this study adds to the comprehension of the elements that impact Ethereum costs besides gives bits of knowledge to financial backers besides policymakers.

**Implications for Policymakers, Investors & Traders**

The discoveries of this study have a few ramifications for policymakers, financial backers, besides brokers inspired by Ethereum costs.

Policymakers, first besides foremost, can utilize the outcomes to foster guidelines besides arrangements that advance soundness in the Ethereum market, considering the effect of outer factors, for example, gold, unrefined petroleum, Bitcoin, SPX, loan costs, trade rates, besides worldwide occasions on Ethereum costs.

Besides, financial backers can utilize the discoveries to frame their venture choices besides foster more successful gamble the executive procedures while putting resources into Ethereum. The review shows that the costs of Ethereum are affected by outer elements, besides financial backers ought to consider these variables while settling on speculation choices.

At last, dealers can likewise profit from the discoveries by utilizing them to foster more compelling exchanging methodologies that consider the effect of outer variables on Ethereum costs. For instance, dealers could utilize the outcomes to recognize patterns besides examples in Ethereum costs that are related with changes in gold costs, raw petroleum costs, Bitcoin costs, SPX costs, loan fees, beside worldwide occasions.

Generally speaking, the review gives significant experiences into the elements that impact Ethereum costs beside can be utilized by policymakers, financial backers, besides dealers to settle on additional educated choices in the Ethereum market.

**Suggestions for Future Research**

Based on the limitations of this study, as well as the potential for further exploration of the topic, several suggestions for future research can be made. These include

- **Analysis of other macroeconomic factors:** This study focused on the impact of gold, crude oil, Bitcoin, SPX, interest rates, exchange rates, and global events on Ethereum prices. Future studies can explore the impact of other macroeconomic factors such as inflation, GDP, and unemployment rates on cryptocurrency prices.

- **Comparison of other cryptocurrencies:** This study only examined the impact of external factors on Ethereum prices. Future studies can compare the impact of external factors on other cryptocurrencies such as Bitcoin, Litecoin, and Ripple.

- **Analysis of the impact of regulations:** Cryptocurrency regulations have become an increasingly important topic in recent years. Future studies can analyze the impact of regulatory changes on cryptocurrency prices.

- **Analysis of sentiment and social media:** The impact of social media sentiment on cryptocurrency prices has been explored in some studies. Future studies can analyze the impact of social media sentiment and other forms of sentiment analysis on cryptocurrency prices.

- **Cross-country analysis:** This study only focused on the impact of external factors on Ethereum prices in the United States. Future studies can compare the impact of external factors on cryptocurrency prices across different countries.

- **Long-term analysis:** This study only analyzed the impact of external factors on Ethereum prices from March 2016 to February 2023. Future studies can analyze the impact of external factors on cryptocurrency prices over a longer period, providing a more comprehensive view of the impact of external factors on cryptocurrency prices.

# Chapter 7

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# Chapter 8

## APPENDIX

**Unit Root Test**

Since the data used for regression analysis is a weekly time series data, therefore the stationarity for the data has to be checked before conducting the regression analysis. Eviews 12 student version software has been used in order to perform this test. The test type Augmented Dickey-Fuller (ADF) test has been used.

For the ADF test following are the hypotheses:
Null Hypothesis: The Variable has a unit root.
Alternate Hypothesis: The variable does not have a unit root.

The following figures will show the result of the ADF test for each of the variables:

**Ethereum:**

Null Hypothesis: D(ETHEREUM) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=16)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -18.04643 | 0.0000 |
| Test critical values: | 1% level | -3.983828 | |
| | 5% level | -3.422391 | |
| | 10% level | -3.134057 | |

*MacKinnon (1996) one-sided p-values.

**Bitcoin:**

Null Hypothesis: D(BITCOIN) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=16)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -17.28361 | 0.0000 |
| Test critical values: | 1% level | -3.983828 | |
| | 5% level | -3.422391 | |
| | 10% level | -3.134057 | |

*MacKinnon (1996) one-sided p-values.

**Crude Oil:**

Null Hypothesis: D(CRUDE_OIL) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 2 (Automatic - based on SIC, maxlag=16)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -9.684290 | 0.0000 |
| Test critical values: | 1% level | -3.983973 | |
| | 5% level | -3.422462 | |
| | 10% level | -3.134099 | |

*MacKinnon (1996) one-sided p-values.

**Exchange Rates:**

Null Hypothesis: D(EUR_USD) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=16)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -21.70943 | 0.0000 |
| Test critical values: | 1% level | -3.983828 | |
| | 5% level | -3.422391 | |
| | 10% level | -3.134057 | |

*MacKinnon (1996) one-sided p-values.

**Gold:**

Null Hypothesis: D(GOLD) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=16)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -19.97360 | 0.0000 |
| Test critical values: | 1% level | -3.983828 | |
| | 5% level | -3.422391 | |
| | 10% level | -3.134057 | |

*MacKinnon (1996) one-sided p-values.

**SPX:**

Null Hypothesis: D(SPX) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=16)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -20.09870 | 0.0000 |
| Test critical values: | 1% level | -3.983828 | |
| | 5% level | -3.422391 | |
| | 10% level | -3.134057 | |

*MacKinnon (1996) one-sided p-values.

**Interest Rates:**

Null Hypothesis: D(INTEREST_RATE) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 5 (Automatic - based on SIC, maxlag=16)

| | | t-Statistic | Prob.* |
|---|---|---|---|
| Augmented Dickey-Fuller test statistic | | -5.064302 | 0.0002 |
| Test critical values: | 1% level | -3.984195 | |
| | 5% level | -3.422569 | |
| | 10% level | -3.134162 | |

*MacKinnon (1996) one-sided p-values.

All the variables are stationary at the first difference as they all satisfy the alternative hypothesis, which means the variables are suitable for the regression analysis.

**Serial Correlation Test**

This test is performed to check whether autocorrelation exists in the data, as it can provide inaccurate results for the regression analysis. Eviews 12 student version software has been used in order to perform this test. The test type Breusch-Godfrey (BG) test has been used.

For the BG test following are the hypotheses:
Null Hypothesis: No serial correlation at up to 2 lags. Alternate Hypothesis: Serial correlation at up to 2 lags.

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

| | | | |
|---|---|---|---|
| F-statistic | 1.941240 | Prob. F(2,351) | 0.1451 |
| Obs*R-squared | 3.938466 | Prob. Chi-Square(2) | 0.1396 |

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 03/07/23 Time: 17:37
Sample: 3/20/2016 2/05/2023
Included observations: 360
Presample missing value lagged residuals set to zero.

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| DLOG(BITCOIN) | 0.003794 | 0.054943 | 0.069046 | 0.9450 |
| DLOG(CRUDE_OIL) | 0.006129 | 0.077210 | 0.079379 | 0.9368 |
| DLOG(EUR_USD) | -0.029388 | 0.665469 | -0.044161 | 0.9648 |
| DLOG(GOLD) | -0.021213 | 0.354398 | -0.059857 | 0.9523 |
| DLOG(INTEREST_RATE) | -0.001699 | 0.035937 | -0.047291 | 0.9623 |
| DLOG(SPX) | -0.011337 | 0.260618 | -0.043499 | 0.9653 |
| C | 1.02E-05 | 0.005862 | 0.001741 | 0.9986 |
| RESID(-1) | 0.081800 | 0.053675 | 1.523984 | 0.1284 |
| RESID(-2) | 0.059091 | 0.053427 | 1.106017 | 0.2695 |

| | | | |
|---|---|---|---|
| R-squared | 0.010940 | Mean dependent var | 1.01E-18 |
| Adjusted R-squared | -0.011602 | S.D. dependent var | 0.109372 |
| S.E. of regression | 0.110004 | Akaike info criterion | -1.551915 |
| Sum squared resid | 4.247421 | Schwarz criterion | -1.454762 |
| Log likelihood | 288.3447 | Hannan-Quinn criter. | -1.513285 |
| F-statistic | 0.485310 | Durbin-Watson stat | 2.003830 |
| Prob(F-statistic) | 0.866553 | | |

As the probability of the t-statistic is greater than 5% (>0.05), it means the alternate hypothesis has been satisfied, hence there is no serial correlation in the data.

**Heteroskedasticity Test**

This test is performed to check whether the data is heteroskedastic or homoscedastic, as heteroskedasticity can provide inaccurate results for the regression analysis. Eviews 12 student version software has been used in order to perform this test. The test type Breusch-Pagan-Godfrey (BPG) test has been used.

For the BPG test following are the hypotheses:
Null Hypothesis: Homoskedasticity. Alternate
Hypothesis: Heteroskedasticity.

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

| | | | |
|---|---|---|---|
| F-statistic | 0.648472 | Prob. F(6,353) | 0.6914 |
| Obs*R-squared | 3.924730 | Prob. Chi-Square(6) | 0.6869 |
| Scaled explained SS | 12.01528 | Prob. Chi-Square(6) | 0.0616 |

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 03/07/23 Time: 17:37
Sample: 3/20/2016 2/05/2023
Included observations: 360

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | 0.011995 | 0.001611 | 7.445522 | 0.0000 |
| DLOG(BITCOIN) | -0.012209 | 0.015084 | -0.809415 | 0.4188 |
| DLOG(CRUDE_OIL) | 0.003158 | 0.021201 | 0.148972 | 0.8817 |
| DLOG(EUR_USD) | 0.161755 | 0.182807 | 0.884842 | 0.3768 |
| DLOG(GOLD) | 0.063539 | 0.097358 | 0.652640 | 0.5144 |
| DLOG(INTEREST_RATE) | 0.010423 | 0.009873 | 1.055699 | 0.2918 |
| DLOG(SPX) | -0.031059 | 0.071334 | -0.435412 | 0.6635 |

| | | | |
|---|---|---|---|
| R-squared | 0.010902 | Mean dependent var | 0.011929 |
| Adjusted R-squared | -0.005910 | S.D. dependent var | 0.030145 |
| S.E. of regression | 0.030234 | Akaike info criterion | -4.140478 |
| Sum squared resid | 0.322665 | Schwarz criterion | -4.064915 |
| Log likelihood | 752.2860 | Hannan-Quinn criter. | -4.110432 |
| F-statistic | 0.648472 | Durbin-Watson stat | 1.336041 |
| Prob(F-statistic) | 0.691369 | | |

As the probability of the t-statistic is greater than 5% (>0.05), it means the null hypothesis has been satisfied, which means Heteroskedasticity does not exist in the data.

**Multi-Collinearity Test**

This test is conducted in order to figure out whether a correlation exists between the multiple independent variables in a multiple regression model. The presence of this correlation can adversely affect the regression analysis results. Eviews 12 student version software has been used in order to perform this test. The test types Variance-Inflation-Factor (VIF) test has been used.

Variance Inflation Factors
Date: 03/08/23 Time: 15:36
Sample: 3/13/2016 2/05/2023
Included observations: 360

| Variable | Coefficient Variance | Uncentered VIF | Centered VIF |
|---|---|---|---|
| DLOG(BITCOIN) | 0.003028 | 1.093337 | 1.082180 |
| DLOG(CRUDE_OIL) | 0.005982 | 1.073788 | 1.073187 |
| DLOG(EUR_USD) | 0.444771 | 1.388573 | 1.388365 |
| DLOG(GOLD) | 0.126151 | 1.342040 | 1.337279 |
| DLOG(INTEREST_R... | 0.001297 | 1.129169 | 1.127294 |
| DLOG(SPX) | 0.067723 | 1.280470 | 1.272943 |
| C | 3.45E-05 | 1.022242 | NA |

Since the Centered VIF value for all the independent variables is less than 5, it indicates that the variables are not correlated.