

Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Trade and Finance



Bachelor Thesis

**Comparative Analysis of Cryptocurrency and Real
Estate Investments**

Ilia Pichkurov

© 2023 CZU Prague

BACHELOR THESIS ASSIGNMENT

Ilia Pichkurov

Business Administration

Thesis title

An assessment of crypto-currency and real estate as investment instruments

Objectives of thesis

The main objective of the thesis is to assess two individual investment portfolios – real estate and cryptocurrency.

As a consequence, the author will draw a conclusion which investment option is more advantageous based on the assessment of ratios and other relevant techniques of evaluating investment options.

Methodology

The author will split the work into two parts – the literature review and the practical part. In the literature review, the author will analyse relevant publications who were developed by scientists in the field of investment and assessment of investment portfolios. In the practical part, the author will perform the main analysis that will consist of NPV, Payback Ratio, Future Value and Rate of Return. On the basis of the analyzes carried out, a suitable investment option for individual types of investors will be assessed and recommended.

The proposed extent of the thesis

30-40 pages

Keywords

investment portfolios, real estate, cryptocurrency, options

Recommended information sources

- DANIAL, Kiana.; LAURENCE, Tiana.; KENT, Peter.; BAIN, Tyler.; SOLOMON, Michael G. *Cryptocurrency All-In-One for Dummies. [elektronický zdroj]* /. Newark: John Wiley & Sons, Incorporated, 2022. ISBN 9781119855811.
- HAIGHT, G. Timothy; SINGER, Daniel. *The real estate investment handbook*. Hoboken: John Wiley, 2005. ISBN 978-0471649229.
- LEWIS, Rhian. *The Cryptocurrency Revolution : Finance in the Age of Bitcoin, Blockchains and Tokens. [elektronický zdroj]* /. London: Kogan Page, Limited, 2020. ISBN 9781789665697.
- THOMAS, Rachael L. *Blockchain and Cryptocurrency. [elektronický zdroj]* /. Minneapolis: Lerner Publishing Group, 2021. ISBN 9781728417943.
- THOMSETT, Michael C. *Getting started in real estate investing*. Hoboken: Wiley, 2009. ISBN 978-0470423493.
-

Expected date of thesis defence

2022/23 SS – FEM

The Bachelor Thesis Supervisor

Ing. Olga Regnerová, Ph.D.

Supervising department

Department of Trade and Finance

Electronic approval: 12. 10. 2022

prof. Ing. Luboš Smutka, Ph.D.

Head of department

Electronic approval: 24. 11. 2022

doc. Ing. Tomáš Šubrt, Ph.D.

Dean

Prague on 29. 11. 2023

Declaration

I declare that I have worked on my bachelor thesis titled "Comparative Analysis of Cryptocurrency and Real Estate Investments" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break any copyrights.

In Prague on 15.03.2023

Acknowledgement

I would like to thank Ing. Olga Regnerová, Ph.D. and all other persons, for their advice and support during my work on this thesis.

Comparative Analysis of Cryptocurrency and Real Estate Investments

Abstract

The main goal of the following thesis is to assess two individual investment portfolios – real estate and cryptocurrency. As a consequence, the author will draw a conclusion which investment option is more advantageous based on the assessment of ratios and other relevant techniques of evaluating investment options. The author will split the work into two parts – the literature review and the practical part. In the literature review, the author will analyse relevant publications that were developed by scientists in the field of investment and assessment of investment portfolios. In the practical part, the author will perform the main analysis that will consist of NPV, Payback Ratio, Future Value and Rate of Return. Consequently, the author comes to the conclusion that the best investment option between the real estate and crypto assets remains the real estate as it is less volatile, offers high annual cashflows in the form of rent and also has higher net present value with a shorter payback period. However, the author suggests that this investment option requires a huge capital, so investment in crypto currencies is a good option for people not possessing large funds.

Keywords: investment portfolios, real estate, cryptocurrency, options

Srovnávací analýza kryptoměn a investic do nemovitostí

Abstrakt

Hlavním cílem následující práce je zhodnotit dvě jednotlivá investiční portfolia - nemovitost a kryptoměnu. V důsledku toho autor vyvodí závěr, která investiční možnost je výhodnější na základě posouzení poměrů a dalších relevantních technik hodnocení investičních možností. Autor práce rozdělí na dvě části - literární rešerši a praktickou část. V přehledu literatury bude autor analyzovat relevantní publikace, které byly vyvinuty vědci v oblasti investic a hodnocení investičních portfolií. V praktické části autor provede hlavní analýzu, která bude sestávat z NPV, poměru návratnosti, budoucí hodnoty a míry návratnosti. V důsledku toho autor dospěl k závěru, že nejlepší investiční možností mezi nemovitostmi a krypto aktivy zůstává nemovitost, protože je méně volatilní, nabízí vysoké roční peněžní toky ve formě nájemného a má také vyšší čistou současnou hodnotu s kratší dobou návratnosti. Autor však naznačuje, že tato investiční možnost vyžaduje obrovský kapitál, takže investice do krypto měn je dobrou volbou pro lidi, kteří nemají velké finanční prostředky

Klíčová slova: investiční portfolia, nemovitosti, kryptoměny, opce

Table of contents

1	Introduction	8
2	Objectives and Methodology	10
2.1	Objectives.....	10
2.2	Methodology	10
3	Literature Review	11
3.1	Cryptocurrencies	11
3.1.1	Concept	11
3.1.2	History	13
3.1.3	The Development of Alternative Coins.....	14
3.1.4	The Peak and the Crash of the Bitcoin Market.....	15
3.1.5	Future.....	15
3.1.6	A Rising Number of Children Who Have Been Adopted	15
3.1.7	Latest Developments in the Field of Technology	16
3.1.8	The Control and Supervision of the Environment.....	16
3.1.9	The Investments Made by Institutional Investors.....	17
3.2	Real Estate Investments	18
3.2.1	History	18
3.2.2	Techniques.....	21
3.3	Investment Assessment	24
4	Practical Part	27
4.1	Essence.....	27
4.2	Volatility Analysis	27
4.3	Net Present Value.....	29
4.4	Internal Rate of Return.....	32
4.5	Payback Period.....	33
5	Results and Discussion	35
6	Conclusion.....	38
7	References	39

List of pictures

Figure 1, standard deviation analysis for real estate.....	28
Figure 2, standard deviation analysis for Bitcoin.....	28
Figure 3, standard deviation analysis for Ethereum	29

Figure 4, net present value calculation for the real estate	30
Figure 5, net present value calculation for bitcoin	31
Figure 6, net present value calculation for Ethereum.....	32
Figure 7, calculated IRR for each investing option.....	33
Figure 8, payback period calculation	33

List of abbreviations

NPV	Net Present Value
IRR	Internal Rate of Return
BTC	Bitcoin
ETH	Ethereum
ROI	Return on Investment

1 Introduction

In the year 2023, almost everyone believes that it is possible to make money without really having to put in any effort at all, at least most of the time. Because of this, individuals began to contemplate methods to acquire them that was not the norm. Drop shipping, affiliate marketing, becoming an influencer, and printing on demand are some examples of these business models. But none of them are as reliable as these two "sharks" when it comes to making money for a livelihood outside of the traditional 9 to 5 workday.

At this current time, investments in real estate and activities involving cryptocurrencies are regarded as two of the assets that have the potential for the greatest internal rate of return (IRO). There is a vast amount of evidence in the form of videos, articles, and studies that support the contention that one of them is an excellent choice for long-term investing, whilst the other choice may be just as beneficial for either long-term or short-term financial planning.

Real estate and cryptocurrency are two types of investments that, for their own individual reasons, may both be deemed to have the potential to provide a profit. An investment in real estate carries with it the possibility that its value may rise over time and the possibility that it will provide revenue in the form of rent. As a result of the consistent pattern of growing property values over the course of time, investing in real estate may also serve as a kind of protection against inflation. On the other hand, cryptocurrency may provide investors the opportunity to make substantial gains while also adding to the diversification of their portfolios. Also, the market for cryptocurrencies is very liquid and can be accessed at any time of the day or night.

Nevertheless, it is necessary to remember that investments in real estate and cryptocurrency each come with their own distinct set of risks, and it is important to keep this in mind at all times. The real estate market might be influenced in a number of ways by a range of factors, such as the status of the economy, the level of interest rates, and the cost of routine property maintenance. There is a high degree of volatility associated with cryptocurrencies, which means that the value of a cryptocurrency may drastically change in a very short period of time.

Before making any decisions about investments, it is essential to carry out a significant amount of background research and conduct an in-depth evaluation of financial goals, degree of risk tolerance, and investment horizon. In addition to this, it is highly recommended that people are able to seek the guidance of a financial counsellor or an expert in the pitch.

2 Objectives and Methodology

2.1 Objectives

The main goal of the following thesis is to assess two individual investment portfolios – real estate and cryptocurrency. As a consequence, the author will draw a conclusion which investment option is more advantageous based on the assessment of ratios and other relevant techniques of evaluating investment options.

2.2 Methodology

The author will split the work into two parts – the literature review and the practical part. In the literature review, the author will analyse relevant publications that were developed by scientists in the field of investment and assessment of investment portfolios. In the practical part, the author will perform the main analysis that will consist of NPV, Payback Ratio, Future Value and Rate of Return.

3 Literature Review

3.1 Cryptocurrencies

3.1.1 Concept

The word "cryptocurrency" refers to a digital form of money that was designed to be both secure and decentralized when it was first invented. This indicates that it is not overseen or governed by a centralized authority, such as a government or a financial institution, and that it is thus free from regulation. Cryptography, which is a means of keeping information secure by using complex mathematical algorithms and encoding, serves as the system's primary building block (Mukhopadhyay, 2016).

For the purpose of keeping, one's cryptocurrency holdings secure, one may keep them in a digital wallet, which is analogous to an online bank account. These wallets have something called a private key, which is essentially a one-of-a-kind password that is only known to the person who owns the wallet. A public ledger, known as a blockchain, is used to record the transactions that take place on the network (Farell, 2019). The record of all of the transactions that have ever taken place on the network is kept in a blockchain, which is a decentralized and transparent ledger of those transactions. A blockchain is used to record the transactions that take place.

If person is currently in a good financial position, have goals that that person want to achieve, and are prepared to take on a certain degree of risk, all of these factors will play a part in evaluating whether or not it makes sense for that person to start investing in bitcoin (Lui, 2019). The market for cryptocurrencies is rife with volatility, there is a dearth of regulation, and there is the prospect of fraud occurring. These dangers are inescapable for whatever investment people make on the daily basis. People need understand that they know enough about cryptocurrency, they have enough of advices from financial consultant and that they have free money that they can spend on that and be financially stable even after that money will be burnt (Milutinovic, 2020).

A cryptocurrency is any kind of money that is digitally produced in the first place and then encrypted via the use of cryptography. Cryptocurrencies may take several forms.

Because of this, it is far more difficult to fake money or spend the same amount of money again. In 2009, Satoshi Nakamoto is credited with the development of the first digital money that was not controlled by a central authority. The term given to this kind of currency is "bitcoin." By 2013, the value of the virtual money known as bitcoin had increased to the point that it was comparable to one thousand dollars. Since that time, an ever-increasing diversity of first-of-its-kind forms of digital currency have emerged and come into existence. There are already over 10,000 unique forms of cryptocurrency that may be used (Fang, 2021). At this time, the two cryptocurrencies that have the biggest value on the market are Bitcoin and Ethereum. Despite the fact that there are an overwhelming amount of other currencies, these two cryptocurrencies have managed to carve out a niche for themselves as the market leaders in the cryptocurrency business.

The mechanisms that support cryptocurrencies operate in a manner that is distinct from the mechanisms that underpin traditional financial systems. The workings of mechanisms that underpin cryptocurrencies function in a manner that is unique. The transactions that take place are likely to be investigated by the financial system on a regular basis, as is the case in the vast majority of banking systems. On the other hand, marketing digital currency is done in a way that is different from selling conventional goods and services. Blockchains, which are also known as distributed public ledgers, are at the center of how cryptocurrencies such as bitcoin and Ethereum carry out their transactional processes. The specific blockchain which is being discussed here is the one that is in charge of keeping a record of all of the transactional activity that was started by holders of money (Liu, 2022).

Mining is the activity that creates the vast majority of bitcoins and is also the name of the process that generates this digital currency. Before one can begin the process of manufacturing coins, they must first be able to successfully complete a series of difficult mathematical exercises. The main manner in which new cryptocurrencies are created is when users who do not participate in mining buy the currencies from brokers and then use crypto wallets to spend the money they have acquired. This is the only way that new cryptocurrencies can be produced. This activity is referred to as "spending" fresh cryptocurrency (Corbet, 2022).

3.1.2 History

The term "cryptocurrency" refers to a digital form of currency that employs cryptography as a means of securing and verifying transactions and of regulating the production of new units. The first decentralized cryptocurrency, Bitcoin, was not formed until the late 2000s, however, the idea of cryptocurrencies may be traced back to the late 1990s (Stanley, 2017).

The idea of digital cash was first proposed in the 1980s; however, it wasn't until the late 1990s that the first efforts were made to develop a decentralized digital currency. Wei Dai presented a paper in 1998 that described a digital currency that he named "b-money." This currency could be used to transmit value from person to individual without the requirement for a central authority to be involved.

In 2008, an unknown person or group of unknown people using the name "Satoshi Nakamoto" released a paper detailing a decentralized digital currency called Bitcoin. This document was published under the name "Satoshi Nakamoto." The technical details of a system that could enable individuals to transfer value directly to each other without the need for intermediaries such as banks or payment processors were outlined in the paper that was titled "Bitcoin: A Peer-to-Peer Electronic Cash System." The paper was titled "Bitcoin: A Peer-to-Peer Electronic Cash System" (Chohan, 2018).

The initial version of the Bitcoin software was made available for download in January 2009. Users were able to transmit and receive Bitcoin via a public record known as the blockchain, which was made possible by the software, the code for which was open-source and was accessible for download by anybody.

Every single transaction that has ever taken place on the Bitcoin network is recorded on the blockchain, which is a decentralized and open ledger of those transactions. A network of nodes, often known as computers, is responsible for maintaining the blockchain. These nodes collaborate in order to verify transactions and add them to the blockchain (Brunton, 2019).

Satoshi Nakamoto and Hal Finney, a computer programmer who was one of the initial users of the technology, carried out the first-ever Bitcoin transaction. Nakamoto was the inventor of Bitcoin. Finney was an early adopter. Throughout the course of the transaction, Nakamoto sent 10 Bitcoin to Finney in exchange for another cryptocurrency.

In the early days of Bitcoin, its use was primarily driven by people who were drawn to the concept of a decentralized currency that was not controlled by any government or financial institution. These people included libertarians and tech enthusiasts who were interested in the potential benefits of such a currency. But, as an increasing number of individuals started making use of and accepting bitcoin, its value started to climb.

In the year 2010, an individual by the name of Laszlo Hanyecz created history by being the first person to buy a physical item using bitcoins. Hanyecz purchased two pizzas for 10,000 Bitcoin, which, at the time, was equivalent to around \$41 USD (Thakur, 2020). In the years that followed, Bitcoin's use and value both continued to increase, which contributed to Bitcoin's overall success. By 2013, Bitcoin's price had risen to an all-time high of more over \$1,000, but in that same year, it went through a significant price drop.

3.1.3 The Development of Alternative Coins

As Bitcoin's popularity increased, new cryptocurrencies started to come into existence. The term "altcoin" is often used to refer to several alternative cryptocurrencies, all of which are founded on decentralized blockchain technology (short for alternative coins).

Litecoin, which was founded by Charlie Lee in 2011, was an early example of an alternative cryptocurrency. Litecoin was developed to be quicker and more efficient than Bitcoin via the use of a unique hashing algorithm and faster block times than Bitcoin. Several alternative cryptocurrencies soon emerged, such as Ripple, Namecoin, and Peercoin. Each alternative cryptocurrency presented its own one-of-a-kind set of benefits over Bitcoin (Mahavydialaya, 2021).

3.1.4 The Peak and the Crash of the Bitcoin Market

The value of cryptocurrencies saw a significant increase in 2017, with Bitcoin hitting a new all-time high of about \$20,000 in December. Other cryptocurrencies also witnessed big rises, and initial coin offers, a novel method of fund-raising that utilizes cryptocurrencies, became popular. Both of these developments occurred in 2017. Yet, the rise in bitcoin prices did not last for very long. The prices of cryptocurrencies went through a significant correction in 2018, with Bitcoin losing more than 80 percent of its value (Hordes, 2019). The regulation of cryptocurrencies has come under growing scrutiny, and numerous nations have either outright banned or severely limited their usage (Abeer, 2017).

3.1.5 Future

At this point, cryptocurrencies have been around for more than a decade, and their influence on the current state of the financial system throughout the globe has been enormous. To say that the development of cryptocurrencies has been nothing short of remarkable would be an understatement. Cryptocurrencies have gone from being seen as a specialized kind of investing to being considered a possible threat to the established monetary order.

3.1.6 A Rising Number of Children Who Have Been Adopted

It's possible that the pace of adoption of cryptocurrencies will be one of the most important variables in deciding their final destination. The use of cryptocurrencies is on the rise, and a rising number of individuals as well as organizations are ready to acknowledge and deal with this form of payment. It is anticipated that this trend will continue since cryptocurrencies provide various benefits over conventional payment methods, such as cheaper transaction costs, quicker processing times, and increased security. The following are some advantages:

In addition, governments and central banks in every region of the globe are now investigating the opportunities presented by cryptocurrencies. Several nations have already

begun the process of issuing their own forms of digital currency, while others are in the process of inventing their very own at this very moment. Because of this increasing use, there may be a greater demand for cryptocurrencies, which may lead to higher prices as well as a larger market capitalization (Carvalho, 2019).

3.1.7 Latest Developments in the Field of Technology

The progression of technology is another element that may play a role in determining the path that the growth of cryptocurrencies will take. Blockchain technology, which is the basis for cryptocurrencies, is always being improved, and new developments are being made to make the platform more efficient, secure, and scalable. This is because blockchain technology serves as the foundation for cryptocurrencies.

For instance, the introduction of the Lightning Network might considerably improve the scalability of Bitcoin, so becoming it more appropriate for use in routine financial dealings. In a similar vein, the introduction of decentralized finance platforms may completely revolutionize the delivery of financial services by enabling individuals to engage in transactions directly with one another, hence removing the need for third parties to function as middlemen (Kang, 2022).

3.1.8 The Control and Supervision of the Environment

Another significant aspect that may play a role in determining the course of future events pertaining to cryptocurrencies is the regulatory climate. The regulatory framework for cryptocurrencies is in its infancy stage at the moment, and nations are exploring a variety of different approaches to the issue of governing digital assets. This is due to the fact that cryptocurrencies are being used in a variety of different contexts.

Yet, due to the fact that an increasing number of nations are passing clear cryptocurrency regulations, there is a high possibility that this may alter over the course of the next several years. Because of this, there is a possibility that a rising number of people would embrace and accept cryptocurrencies as genuine financial instruments, which will result in an increase in the value of cryptocurrencies.

3.1.9 The Investments Made by Institutional Investors

Over the course of the last several years, the level of interest that institutional investors have shown in virtual currencies such as bitcoin and Ethereum has grown. Many well-known financial organizations, like JPMorgan and Goldman Sachs, have established trading desks for cryptocurrencies, while other well-known financial institutions have made investments in companies that are tied to cryptocurrencies.

It is possible that the participation of institutional investors in the cryptocurrency market would result in enhanced liquidity and stability, which will ultimately result in a rise in the value of cryptocurrencies. Also, the growing interest from institutional investors may assist to lessen the volatility of cryptocurrencies, making them more appealing to mainstream investors (Tandon, 2021).

Lastly, worries about the state of the environment may play a key part in the development of the future of cryptocurrencies. This is something that has been a growing issue in recent years. For the purpose of validating transactions and adding new blocks to the blockchain, mining consumes a significant amount of energy. As a direct result of this, there are worries over the effects that cryptocurrencies will have on the environment.

Although certain cryptocurrencies, such as Bitcoin, have been criticized for their excessive use of energy, other cryptocurrencies are looking into more energy-efficient mining techniques. Bitcoin was one of the cryptocurrencies that received this criticism. Ethereum is one example of a cryptocurrency that has come under fire for the excessive amount of energy it consumes. The use of alternate forms of energy may be of significant assistance in this regard, in addition to aiding in the settlement of the environmental challenges that are related to cryptocurrencies.

It is not possible to predict the future of cryptocurrencies with absolute certainty; nonetheless, there are a number of variables that point to a positive future for digital assets. It is possible that the development of cryptocurrencies will be significantly impacted by a number of important issues. These variables include, but are not limited to, increased

acceptance, technology developments, more legal clarity, institutional investment, and worries about the environment (Lin, 2019).

In spite of the fact that there are still a lot of obstacles to overcome, such as a lack of clarity surrounding laws and worries about the environment, the potential advantages of bitcoin are not something that should be underestimated. It is anticipated that cryptocurrencies will play a more prominent part in the global financial system as the globe continues its transition toward a more digitalized society.

3.2 Real Estate Investments

3.2.1 History

To put this in context, cryptocurrencies have been available for more than a decade, and their influence on the current state of the global financial system has been enormous. To claim that the development of cryptocurrencies has been anything less than remarkable would be an understatement; to imply otherwise would be an exaggeration. Once seen as a niche kind of investment, cryptocurrencies are now recognized as potentially presenting a threat to the current monetary system. This adjustment in view happened swiftly.

Despite the fact that it is hard to predict what will happen with cryptocurrencies in the future, there are a number of variables that point to a bright future for digital assets. These indications suggest that digital assets have a promising future (Lui, 2019).

It's possible that the pace of adoption of cryptocurrencies will be one of the most important variables in deciding where they end up in the long run. The use of cryptocurrencies is expanding, and an increasing number of individuals and companies are preparing to recognize and accept this sort of payment. This trend is expected to continue since cryptocurrencies provide several benefits over conventional payment methods, such as cheaper transaction costs, faster processing times, and improved security. Since cryptocurrencies give numerous advantages, this tendency is projected to continue. Among the advantages are the following:

Moreover, governments and central banks all around the globe are now researching the opportunities presented by cryptocurrencies. While some countries have already begun the process of issuing their own types of digital money, others are still designing their own. Several governments have already begun to issue their own types of digital money. As the use of cryptocurrencies grows, there may be a greater demand for them, which might lead to higher prices and a larger market capitalization if this trend continues.

Another element that may play a role in determining the direction of bitcoin industry growth is technological advancement. Blockchain technology, which serves as the basis for cryptocurrencies, is always evolving and improving. These improvements are designed to make the platform more effective, secure, and scalable. This is because blockchain technology serves as the foundation for virtual currency transactions (Ante, 2021).

For example, the Lightning Network's debut might greatly boost Bitcoin's scalability, making it more appropriate for use in regular financial operations. As a result, Bitcoin would be more acceptable for use in regular financial transactions. Similarly, the introduction of decentralized finance systems has the potential to totally transform the delivery of financial services. These platforms will let people conduct transactions directly with one another, eliminating the need for third parties to act as intermediaries in these transactions.

Administration of Control and Monitoring Authorities Over the Environment

The current regulatory environment is yet another important aspect that has the ability to influence the course of future cryptocurrency occurrences (McCory, 2021). At the moment, the legal framework for cryptocurrencies is still in its infancy, and governments across the globe are looking at a variety of possible answers to the challenge of how to handle digital assets. This is due to the fact that cryptocurrencies are used in a broad variety of settings and applications.

Yet, given a rising number of countries are enacting explicit legislation involving cryptocurrencies, there is a good chance that this may change in the next years. This is because a rising number of countries are establishing explicit cryptocurrency legislation. As a result, there is a probability that a rising number of people would embrace and accept

cryptocurrencies as legitimate financial instruments, resulting in an increase in cryptocurrency value.

The level of interest shown by institutional investors in virtual currencies such as bitcoin and Ethereum has grown over the last several years. Bitcoin and Ethereum are two examples of such currencies. Some well-known financial institutions, like JPMorgan and Goldman Sachs, have established cryptocurrency trading desks. Moreover, numerous well-known financial institutions have made investments in cryptocurrency-related businesses (Heid, 2021).

The engagement of institutional investors in the cryptocurrency market may result in increased liquidity and stability, resulting in a rise in the value of cryptocurrencies. If institutional investors joined the bitcoin market, this would be the case. Moreover, greater interest from institutional investors may help to reduce cryptocurrencies' volatility, making them more appealing to mainstream investors. This might be due to the increasing popularity of cryptocurrencies.

The concept of land ownership and property rights can be traced back to ancient civilizations, which is crucial to the history of real estate since these principles were initially established there. In ancient Egypt, the land was split into plots, each of which might be owned by a separate individual or family. Both the ancient Greeks and Romans had a property ownership system, and the land was used for a number of purposes, including farming, hunting, and other activities.

The feudal system, a hierarchical social structure based on land ownership that arose in Europe throughout the Middle Ages, may be summarized as follows: The feudal system was marked by a variety of duties and responsibilities linked with land ownership. Obligations were the names given to these commitments and duties. The monarch or lord possessed the whole country, which was divided among vassals. In exchange for the ability to use the property, the vassals were forced to swear an oath of loyalty and perform military service (Manganelli, 2021).

During the early modern period, the concept of a person owning their own private property began to take form. The rise of capitalism, which enabled individuals to gain wealth and invest in real estate, had a role in this development. The general public had increased access to land ownership, and the concept of land as a commodity began to emerge during the same period.

Since urbanization and industrialization created a need for housing and commercial space, the real estate grew to become an important component of the modern economy in the 18th and 19th centuries. This happened throughout the Industrial Revolution era. Moreover, the construction of railroads and other kinds of transportation infrastructure made it easier for people to move about and goods to travel long distances.

The growth of real estate markets, as well as a rise in the number of real estate agents, brokers, and developers, helped put the real estate industry into a position where it could compete on a global basis during the twentieth century. The creation of zoning restrictions and construction standards, which assisted in the process of sculpting the physical environment, were among the first moves made by governments worldwide to regulate real estate transactions (Sirmans, 2021).

The global worth of property is estimated to be in the billions of dollars, making real estate a critical component of the global economy in the contemporary period. The real estate market is very volatile because it is influenced by a wide range of economic, social, and environmental factors. Despite these changes, real estate remains a popular investment choice because it provides individuals and institutions with a tangible asset that may deliver both income and capital gains.

3.2.2 Techniques

The choice of specific strategies to implement is determined by a variety of aspects, such as the objectives, level of comfort with risk, and length of time available for investment. Although some investors may want to concentrate on long-term tactics such as buy-and-hold investing, others may favor more short-term techniques such as fix-and-flip investing. But

others can seek to delay taxes on their real estate assets by participating in 1031 exchanges or investing in real estate investment trusts (Eldred, 2022).

Since they have been shown to be successful at creating income and developing wealth, the methods and tactics that I outlined are often employed in real estate investing. This is due to the fact that real estate investing is a popular investment vehicle. But, there is no one-size-fits-all strategy to real estate investing, and successful investors must be able to modify their methods in response to shifting market circumstances and their own individual investment objectives.

Research, doing one's due diligence, and developing a solid investment strategy are ultimately going to be the most crucial aspects of real estate investing. Investors should do exhaustive research on the regional real estate market, carefully examine suitable investment properties, and work up a complete strategy for managing their assets over the long term. Investors are able to construct a lucrative real estate portfolio that results in sustained prosperity and financial security if they adhere to tried-and-true investing concepts and make use of the techniques that have shown to be most effective for them personally (Webb, 2021).

Buy and hold is an investment strategy that entails the purchase of a piece of real estate with the aim of keeping possession of it for a considerable amount of time, often for a number of years or even decades. The objective is to profit not only from the steady increase in the property's value over time, but also from the steady income that may be generated through rental payments. Since it may be many years before the property's value increases and it begins to yield large profits, this technique needs patience and a long-term vision.

The term "**fix and flip**" refers to an investment strategy that entails acquiring a home that is in need of repairs, upgrading the home, and then selling the home for a profit. The objective is to purchase the real estate at a cheap price, then put money into improvements like repairs and upgrades before selling it for a better price as soon as feasible. To be successful with this tactic, you will need a sharp eye for spotting homes that have untapped potential, as well as an understanding of the expenses associated with refurbishment and new construction.

Finding properties that are either significantly cheap or in a state of disrepair and then immediately selling them to another investor without making any repairs or renovations is the method known as wholesale. Without making any financial investments in repairs or enhancements, the objective is to generate a profit from the spread between the buying price and the selling price of the property. A network of investors who are interested in acquiring foreclosed homes is essential to the success of this approach, which also involves the ability to recognize properties that have untapped potential (Wilson, 2021).

Syndication is a method of investing that entails combining resources with those of other investors in order to acquire a piece of real estate. Each investor pays a certain amount towards the overall purchase price and receives a proportionate part of the ownership of the property as well as the earnings it generates. One of the investors will often take on the role of managing partner and be accountable for the management of the property as well as the decision-making on behalf of the group. To be successful with this technique, you will need the ability to recognize and evaluate potential investment possibilities, as well as the capacity to manage relationships and negotiate contracts.

Real Estate Investment Trusts, sometimes known as REITs, are businesses that are listed publicly and that own and manage real estate properties that generate revenue. Investors have the opportunity to buy shares in the real estate investment trust (REIT), which rights them to a portion of the profits and rental revenue produced by the properties controlled by the trust. With the help of this tactic, investors are able to participate in the real estate market without taking on the responsibility of managing the properties themselves.

The 1031 Exchange is a mechanism that allows one to avoid paying capital gains taxes on the sale of a property by utilizing the profits from that property's sale to acquire another piece of real estate. It is common practice for investors to employ this tactic in order to postpone the payment of taxes on the profits earned from the sale of a property. This affords the investor the opportunity to reinvest the proceeds from the sale in another piece of estate and to keep expanding their estate portfolio (Falkenbach, 2021).

3.3 Investment Assessment

Crypto Investment Assessment:

In recent years, there has been a lot of interest in cryptocurrency due to the fact that it has the potential to radically disrupt the present financial system. This is one reason why there has been so much interest in cryptocurrency. Despite this, investing in cryptocurrencies is a high-risk endeavor due to the increased volatility of the market and the lack of predictability around digital currency. Before making any investments in cryptocurrencies, there are a few things you should take into mind, including the following:

The markets for cryptocurrencies are notoriously volatile, and significant price movements may take place in very short lengths of time. If a person wants to be successful as an investor, they should not spend more money than they can afford to lose and they should be prepared to endure significant financial setbacks.

Since the regulatory environment is mostly unmanaged, bitcoin markets are susceptible to being manipulated and defrauded because of the regulatory hoover that exists. Another aspect that adds to the market's uncertainty over the future of cryptocurrencies is the lack of any kind of regulatory regulation. Investors should be aware that there is a risk that regulatory requirements may change in the future since this may have an impact on the value of their investment if it occurs (Wurtzback, 2019).

Blockchain technology, which is the basis for cryptocurrencies, is still in its early stages and has not been subjected to exhaustive analysis. There are potential technical dangers posed by this. There is a possibility that the value of cryptocurrencies could be negatively impacted by certain risks linked with the technology, such as security flaws, software faults, and other types of technical issues. This possibility exists because there is a possibility that the value of cryptocurrencies could be negatively impacted by certain risks linked with the technology.

Since traditional financial markets have a higher level of liquidity than cryptocurrency markets, buying and selling cryptocurrencies may be more difficult and expensive. While

buying and selling cryptocurrencies, investors need to be aware that the wait periods and transaction charges will be much higher compared to those of typical financial operations.

Despite the fact that there is the potential for enormous rewards in the cryptocurrency market, investors should be aware of the dangers connected with investing in this extremely volatile and unregulated market. In general, investors should be mindful of the risks that are associated with investing in this market (Georgiev, 2021).

Real Estate Investment Assessment:

An investment in real estate, which is a tangible asset, has long been seen as one that is trustworthy and fruitful, and this perception has not changed. Yet, it is essential to keep in mind that investing in real estate comes with a variety of risks, all of which need to be taken into consideration.

Right now many factors, such as the status of the economy, the level of interest rates, the level of supply and demand, and the equilibrium between the two, all have the potential to influence the real estate market in some way. Before placing their money into the local real estate market, investors need to undertake comprehensive research on the market and take into consideration both the short-term and long-term trends. Only after doing this would it be prudent for them to invest.

Keeping up with the administration and maintenance of real estate may be time-consuming and labor- and resource-intensive, respectively. One component of this precondition is the administration of the property. It is essential for investors to have a plan prepared for the administration of their properties, regardless of whether or not they intend to undertake the responsibilities themselves or outsource them to a property management company.

Financing: Since real estate deals usually need a significant amount of cash, investors frequently discover that they need to take out loans in order to finance their purchases. This is because financing is required in order to fund their acquisitions. Investors have a responsibility to give careful attention to the many different options for financing that are open to them and to check that they are in a position to keep their promise to make

repayments. It is generally agreed that real estate is an asset that has a low degree of liquidity. This suggests that the process of purchasing and selling real estate may be more complicated and time-consuming than the process of purchasing and selling stocks or other financial assets. When it comes to the buying and selling of real estate, investors should be prepared for the prospect of longer wait times as well as higher transaction charges than usual (Hartzell, 2021).

Real estate may be a secure and profitable investment in general; nevertheless, potential buyers and sellers should carefully analyze the market conditions, the requirements for property management, the financing possibilities, and the liquidity of the market before making an investment.

4 Practical Part

4.1 Essence

The essence of the author's practical part is a comparative analysis of two cryptocurrencies of the author's choice and a selected average property price in one prominent European city. To be more specific, the author selects Bitcoin (BTC) and Ethereum as investment options for a very specific reason – these are the biggest cryptocurrencies according to their market capitalization and also according to price, so it is generally possible to compare them to real estate investment. On the other side, the author takes a median listing price per square meter in the USA, which returns an upward-sloping trend in the least 6 years. Henceforth, the author selects the time interval between 2017-2022 as a basis for the calculation of relevant techniques and also for the decision-making process.

The author uses the help of excel to perform all calculations based on data collected from open sources – for cryptocurrencies, the author primarily uses Yahoo Finance! database and for listing price per square meter, the author used the FRED database. Calculation and valuation will be based on the most optimistic variant, where returns for both are proposed to be the highest.

4.2 Volatility Analysis

To begin with, it is first wise to start by assessing the volatility of the selected investment bundle. Clearly, there are many various techniques that can help the author to assess volatility, but the overwhelming majority of them are suitable for publicly traded securities, such as stocks and bonds. The situation of real estate and cryptocurrencies is slightly different, especially the nature of those investments, so the author uses a technique that is suitable for both of them, and it is the calculation of standard deviation, which is calculated using excel for both of them. Below, the author presents the database used for the calculation of volatility for real estate in the USA:

Figure 1, standard deviation analysis for real estate

DATE	MEDLISPRIPERSQUFEEUS	Chain Base Index
01.01.2017	132	-
01.01.2018	141.8333333	7%
01.01.2019	149.9166667	6%
01.01.2020	163.25	9%
01.01.2021	192.1666667	18%
01.01.2022	222.42	16%

Standard Deviation
34.26068571
Coefficient of Variation
21%
Average deviation
11%

Source: own processing based on Yahoo Finance data

According to the calculations performed by the author, it is possible to say that the average variability of the data is 21%, meaning that the risk of investing in real estate is 21%, which is not high. What is even more, when looking at the average deviation, it becomes obvious that per year, the average increment was equal to 11%, so the variation of this data is explained by an upward tendency in the price of the property, which is a good sign. Then, the author presents the breakdown of Bitcoin:

Figure 2, standard deviation analysis for Bitcoin

DATE	Bitcoin price, USD	Chain Base Index
01.01.2017	4342.76193	-
01.01.2018	7187.7007	66%
01.01.2019	7344.44503	2%
01.01.2020	12320.3015	68%
01.01.2021	47042.4528	282%
01.01.2022	26979.5221	-43%

Standard Deviation
16565.21053
Coefficient of Variation
94%
Average deviation
75%

Source: own processing based on Yahoo Finance data

According to the calculations performed by the author for Bitcoin (BTC), it can be concluded that the coefficient of variation is equal to 94%, meaning that the standard deviation represents 94% of the average price for the selected time period, which is simply enormous. Yet, the variability is explained by an upward tendency in the price of a crypto asset – the same as for real estate, where the deviation is equal to 75%, meaning that on

average, the yearly increment of bitcoin is equal to 75% compared to the previous year's observation. Finally, the author proceeds to calculation of the standard deviation of Ethereum (ETH):

Figure 3, standard deviation analysis for Ethereum

DATE	Ethereum price, USD	Chain Base Index
01.01.2017	256.6076805	-
01.01.2018	455.5295615	78%
01.01.2019	178.6175442	-61%
01.01.2020	339.8586286	90%
01.01.2021	2832.158732	733%
01.01.2022	1851.466692	-35%

Standard Deviation
1099.100658
Coefficient of Variation
112%
Average deviation
161%

Source: own processing based on Yahoo Finance data

Finally, Ethereum's coefficient of variation is equal to 112%, which is not just a lot, but it is simply huge meaning that the variability (standard deviation) is even higher than the mean of the investment option. However, the average annual increment for Ethereum is high at 161%, which is a good sign, but the variability is still high.

4.3 Net Present Value

In order to calculate the net present value, the author needs to hypothesize the potential cash flow that will be received by Bitcoin, Ethereum and investment in real estate. The author will assume that he invests a given sum of money equal to 100,000\$ and the author computes the potential internal rate of return of each investment bundle (investment options are mutually excludable, so it is either real estate, Ethereum or Bitcoin). When it comes to the estimation of cash flows, the objective is much easier for the real estate option, where a given house can be rented and a particular stable cash flow is received. Based on the information obtained from open sources and statistical platforms, the average American renter pays a fee of approximately 1,300\$, meaning that buying a house in the USA and renting it will bring an annual cash flow of 15,600\$ (Nguyen, 2022). The author assumes that he will hold this investment for 5 years after buying it and will sell it for the amount that will live up to the average annual growth of the price per square meter – 11%. Hence, the author hypothesizes that the original price of the investment will be equal to 152,000\$. As

for the discount rate, the author selects the discount rate of 5%, which is a suitable option for the real estate market.

The following formula is selected by the author for the discount of both cashflows and total investment:

$$PV = \frac{CF_n}{(1+r)^n}, \text{ where:}$$

CF_n stands for annual cash flows per each period;

R stands for the selected discount rate;

N stands for the total number of periods, five in the context of the author's research.

The calculation is presented below:

Figure 4, net present value calculation for the real estate

Period	0	1	2	3	4	5
	t0	t1	t2	t3	t4	t5
CF rent	0	15,600	15,600	15,600	15,600	15,600
Cf investment	-100,000	0	0	0	0	152,000
Cf rent discounted	0	14,857	14,150	13,476	12,834	12,223
Cf investment discounted	-100,000	0	0	0	0	119,096
Total discounted cash flow	-100,000	14,857	14,150	13,476	12,834	131,319

Net Present Value	86,636
--------------------------	--------

Source: own processing

Henceforth, it is possible to make two quick observations – the net present value of the real estate option is surely enough positive, and it is equal to 86,636\$, which is a good result given the relatively long period of time selected.

Then, continuing to the second investing option – Bitcoin. Yet, the situation with discounting bitcoin is not that simple, as there are no direct means of having any stable cash flow from bitcoin, since it does not pay any dividends, nor it can be anyhow rented. Henceforth, the author assumes that he will stick to the most optimistic variant, where he will manage to use weekly deviations – ups and downs of bitcoin and sell it on its pick so that his total profit from reselling and buying back bitcoin will be equal to at least 2,000

annually, which seems rather feasible. By the end of the fifth year, the author will sell bitcoin for a relatively optimistic yet feasible price of 30,000\$, thus totalling the total selling price of crypto assets held from the beginning until the end to 171,300\$. The discount rate used is equal to the same value of 5%. The calculation for Bitcoin is available below:

Figure 5, net present value calculation for bitcoin

Period	0	1	2	3	4	5
	t0	t1	t2	t3	t4	t5
CF rent	0	2,000	2,000	2,000	2,000	2,000
Cf investment	-100,000	0	0	0	0	171,300
Cf rent discounted	0	1,905	1,814	1,728	1,645	1,567
Cf investment discounted	-100,000	0	0	0	0	134,218
Total discounted cash flow	-100,000	1,905	1,814	1,728	1,645	135,785

Net Present Value	42,877
--------------------------	--------

Source: own processing

Clearly, the net present value for bitcoin is also positive, but the value is almost two times lower than for the real estate investment option.

Then, the author continues to the second investment option – Ethereum and the author sticks to the same logic of calculating the net present value. Yet, the values for annual cashflows will be slightly different, since the variation of ETH is higher. Hence, the author assumed that his annual cashflow will reach 3,000\$ and he will be able to sell his ETH coins in 5 year’s time for approximately 2,500\$, according to the relevant history of observation of ETH relative to Bitcoin and some relevant prognoses (Poongodi, 2020). Consequently, the author comes up with the following calculation of the net present value for ETH:

Figure 6, net present value calculation for Ethereum

Period	0	1	2	3	4	5
	t0	t1	t2	t3	t4	t5
CF rent	0	2,000	2,000	2,000	2,000	2,000
Cfinvestment	-100,000	0	0	0	0	171,300

Cfrent discounted	0	1,905	1,814	1,728	1,645	1,567
Cfinvestment discounted	-100,000	0	0	0	0	134,218
Total discounted cash flow	-100,000	1,905	1,814	1,728	1,645	135,785

Net Present Value	42,877
--------------------------	--------

Period	0	1	2	3	4	5
	t0	t1	t2	t3	t4	t5
CF rent	0	3,000	3,000	3,000	3,000	3,000
Cfinvestment	-100,000	0	0	0	0	185,000

Cfrent discounted	0	2,857	2,721	2,592	2,468	2,351
Cfinvestment discounted	-100,000	0	0	0	0	144,952
Total discounted cash flow	-100,000	2,857	2,721	2,592	2,468	147,303

Net Present Value	57,941
--------------------------	--------

Source: own processing

Consequently, the author can also conclude that the net present value of Ethereum is positive, which is surely enough a good sign. However, the values are still significantly lower than the net present value of investing in real estate in the USA.

4.4 Internal Rate of Return

Apart from calculating the net present value and obviously choosing his favourite for being the best investment option under the optimistic scenario, the author also focuses on the calculation of the internal rate of return, which is another useful metric for assessing and comparing different investment options.

Figure 7, calculated IRR for each investing option

Real Estate	BTC	ETH
22%	13%	15%

Source: own processing

More or less the same pattern is identified in the internal rate of return for three investment options – the highest one is identified in the real estate option, while the lowest one is spotted for Bitcoin, which is quite expected especially given the fact that the author has already taken a glimpse at the net present values of each investment options.

4.5 Payback Period

Finally, the author focuses on the calculation of the payback period under the scenario that the author will invest 100,000\$ in either investing option and will be receiving the same annual cash flow as the ones used for the analysis of the net present value of investing options. The author bases his calculations on the following formula:

$$Payback\ Period = \frac{Total\ Value\ of\ the\ Investment}{Annual\ Cash\ Flow}$$

The following figures contain the output for the analysis of the payback period for each investing option:

Figure 8, payback period calculation

	Real Estate	BTC	ETH
Investment	100,000	100,000	100,000
Annual Cash-Flow	15,600	2,000	3,000
Payback Period	6.4102564	50	33.333333

Source: own processing

Henceforth, it is possible to say that the shortest payback period is identified in the real estate investing option, where the recovery or payback period for an investment worth 100,000 with an annual cash flow equal to 15,600 (assumed average price of renting a house/flat) is

6.4 years, which is definitely a good result. Not highly profitable, but a good one. For the two cryptocurrencies, the results are not at all optimistic, whereas it is needed for a person to spend almost a lifetime after investing 100,000\$ in either Bitcoin or Ethereum to recover his or the value of the original investment.

5 Results and Discussion

In the results and discussion, it is downright essential to highlight the most essential and relevant findings of the author. Thus, the author concludes that whenever a given investor decided to invest in the housing market in the USA, which was rapidly expanding and increasing for the last decade after the Great Recession, he or she is expected to recover her original investment of 100,000\$ in just 6.4 years, which is a very good result. What is more, having a house would offer the investor an opportunity to rent to somebody and receive approximately 15,600\$ annually on average, according to the author's calculations based on relevant findings and statistical data. According to raw facts and the outcome of his calculation, also when taking into consideration a low variability or risk of just approximately 20%, real estate seems to be the perfect investment and it outcompetes the other two options by far. Yet, it is also wise to reflect on the very idea of investing in real estate. As the author has specified earlier, the market itself was blooming after the Great Recession, when the housing crisis was one of the main reasons behind the huge fall of the American and also consequently the global economy.

According to other authors, this was something that is regarded as total chaos that made the fall of the American and global economy inevitable, however, it is not likely to happen in the nearest future, according to the same researcher (Milan, 2015). The author agrees with what has been concluded by the academist and the author justifies his belief that investing in real estate might not be incredibly profitable, but it is a safe investment where, above all, an investor is almost guaranteed to get a stable annual cashflow by renting the house or the flat. What is even more, supposing that something that happened in 2008 will happen again is impossible for a very simple reason – such a devastating housing crisis as in the 00s is not likely to happen due to the strengthening of mortgage giving mechanism, where banks now use a much safer mechanism for assessing clients as solvent ones and offering them mortgages. Yet, there might be complicated and adverse periods, especially during recessions, where some people will not be able to afford their mortgage anymore and they will have to sell their houses, thus increasing the supply and consequently decreasing the prices, which would be bad for investors focused on the real estate, but those minor changes and a seasonal increase in supply will still not be able to blow the real estate market and create a housing crisis, the same as happened in 2008 and earlier years predeceasing the

Great Recession. What is even more, the author has selected the United States on purpose, because it is a country that had a history of housing crises before and their new regulations are likely to protect not just banks and ordinary people, but also investors seeking to invest in real estate.

Contrary to other countries, such as the Czech Republic, where researchers expect the bubbly market to burst to cause a housing crisis also under the weight of people not being able to cope with two-digit inflation, who start to sell their houses and flats under the heavy burden of diminishing real earnings (Obloukova, 2021). Contrary to the positive and optimistic assumptions made by the author, there are still opinions from other academists that the American housing market is bubbly and it can surely burst to cause a housing crisis (Harnaga, 2021). Another problem with investing in real estate is the fact that this domain of investment is not accessible to everyone, as there is a high starting capital needed and people having just a couple of thousands of dollars will not anyhow enter the niche.

On the contrary, the author has also assessed two cryptocurrencies and came to the conclusion that investing in them will also bring a positive net present value and the investor will be in profit, yet, a smaller one than if he or she has chosen the option of investing into the real estate market. Of course, this seems rather optimistic and good, but it is wise to understand that the author was sticking to the optimistic scenario, where an annual cash flow would be received and the original price of an asset will go up in the 5 years' time. However, when it comes to comparing cryptocurrencies to the real estate market, it is not at all possible to say that the collapse is impossible – quite on the contrary, as other authors say, all cryptocurrencies are pure speculation and the market is bubbly, and about to burst in just a matter of months/years (Auer, 2022). Of course, this logic is partially supported by the author, but he believes that crypto projects are working on providing some value to their coins through innovation and the introduction of new technologies, such as smart contracts, for instance. Yet, the author believes that speculative assets are surely enough not ones which should be regarded as serious options when an investor possesses such a large sum of money as 100,000\$, as it was analyzed in the author's practical part. However, there is a huge benefit to investing in cryptocurrencies – it is accessible to almost anyone and the niche can be entered by literally any investor having access to the Internet and crypto exchanges, such as Binance. What is more, high variability (around 100% and even above, in some cases,

according to the computed coefficient of variation by the author in the practical part) does not only provide an opportunity to lose, but it also offers investors a chance to double the value of their original investor by properly putting their money into crypto assets. Still, in the argument of real estate and cryptocurrencies, the author sticks to the first option under the condition that an investor possesses large sums of money to offer a given real estate.

6 Conclusion

To conclude, the author would like to highlight the fact that real estate investments turned out to be significantly more beneficial compared to cryptocurrencies based on the following arguments:

- 1) Investing in real estate entails a lower risk – approximately 20% of variability compared to approximately 100% and higher for selected options.
- 2) Investing into real estate entails a shorter payback period of approximately 6 years, compared to astonishingly high figures for cryptocurrencies under the optimistic scenario.
- 3) Investing in real estate entails a higher return, which was proven by the author's calculation of the net present value and internal rate of return.

Yet, the author also believes that investing in real estate is not accessible to everyone, as assets of the market require huge sums of money that cannot usually be obtained by weng or amateur investors. As for cryptocurrencies, they offer a perfect opportunity for inexperienced investors and investors having a low starting capital to enter the world of investment, where they would be able to double their capital by investing properly.

The final recommendation of the author would be investing in the real estate market given that an investor possesses an amount of money equal to 100,000\$ or exceeding this amount since this amount is usually enough to buy a house or real estate in almost any country on Earth with a booming real estate market. If a given investor does not hold such large sums of money, investing in cryptocurrencies is recommended, since it is a kind of market where investors are able to double their capital in just a short period of time.

7 References

- Abeer ElBahrawy, L. A.-S. (2017). Evolutionary dynamics of the cryptocurrency market. *Royal Society Open Science*, 18-25.
- Auer, R., & Tercero-Lucas, D. (2022). Distrust or speculation? The socioeconomic drivers of US cryptocurrency investments. *Journal of Financial Stability*, 62, 101066.
- Ante, L. (2021). Cryptocurrencies. *Blockchain Research Lab, Germany*, 80-87.
- Brunton, F. (2019). A History of Cryptocurrency. *International Association of Hyperpolyglots*, 79-126.
- Carvalho, A. (2019). What the History of Linux Says About the Future of Cryptocurrencies. *Communications of the Association for Information Systems*, 79-85.
- Chahat Tandon, S. R. (2021). How can we predict the impact of the social media messages on the value of cryptocurrency? Insights from big data analytics. *International Journal of Information Management Data Insights*, 20-72.
- Chohan, U. (2018). The Problems of Cryptocurrency Thefts and Exchange Shutdowns. *Centre for Aerospace & Security Studies*, 37-82.
- Eldred, G. W. (2022). Investing in Real Estate. *Eldred*, 82-99.
- Fan Fang, C. V.-R. (2021). Cryptocurrency trading: a comprehensive survey. *Financial Innovation*, 172-188.
- Farell, R. (2019). An Analysis of the Cryptocurrency Industry . *Wharton Undergraduate Scholars*, 5-678.
- FRED. (2022). *Median sales price of houses sold for the United States* Retrieved January 11, 2023, from <https://fred.stlouisfed.org/series/MSPUS>
- Georgi Georgiev, B. G. (2021). Benefits of Real Estate Investment. *The Journal of Portfolio Management*, 173-284.
- Harnaga, B. J. (2021). Another housing bubble? a review of historical indicators and analysis of the current state of the US residential real estate market.
- Heid, A. (2021). Analysis of the Cryptocurrency Marketplace. *Alex Heid*, 19-84.
- Heidi Falkenbach, A.-L. L. (2023). Environmental Sustainability: Drivers for the Real Estate Investor. *Journal of Real Estate Literature* , 183-200.
- Hordes, S. M. (2019). To the End of the Earth: A History of the Crypto-. *Columbia University Press*, 117-173.

- Jay C. Hartzell, L. S. (2022). The Effect of Corporate Governance on Investment: Evidence from Real Estate Investment Trusts. *Real estate Economics*, 163-170.
- Kang, K.-Y. (2022). Cryptocurrency and double spending history: transactions with zero confirmation. *Econ Theory* , 19-83.
- Liu, X. F., Jiang, X.-J., Liu, S.-H., & Tse, C. K. (2020). Knowledge Discovery in Cryptocurrency Transactions: A Survey. *IEEE*, 79-98.
- Mahavidyalaya, V. P. (2021). Pros and Cons of Cryptocurrency: A Brief Overview. *Vaijapur* , 38-84.
- Manganelli, B. (2021). Real Estate Investing. *Springler*, 36-70.
- Mian, A., & Sufi, A. (2015). *House of debt: How they (and you) caused the Great Recession, and how we can prevent it from happening again*. University of Chicago Press.
- Milutinovic, M. (2020). ICT Information and Communications Technologies. *CEEOL* , 105-122.
- Nguyen, B. T. T. (2022). Can housing investment hedge against inflation?. *International Journal of Housing Markets and Analysis*, (ahead-of-print).
- Obloukova, A., & Vitkova, E. (2021). DIFFERENCE BETWEEN THE REAL ESTATE OFFER AND SALE PRICES IN THE CZECH REPUBLIC. *Economic and Social Development: Book of Proceedings*, 9-19.
- Patrick McCorry, M. M. (2020). Why Preventing a Cryptocurrency Exchange Heist Isn't Good Enough. *Springler*, 30-82.
- Poongodi, M., Sharma, A., Vijayakumar, V., Bhardwaj, V., Sharma, A. P., Iqbal, R., & Kumar, R. (2020). Prediction of the price of Ethereum blockchain cryptocurrency in an industrial finance system. *Computers & Electrical Engineering*, 81, 106527.
- Shaen Corbet, D. J. (2022). The destabilising effects of cryptocurrency cybercriminality. *Economic Letters*, 197-200.
- Sirmans, E. W. (89-100). Investing in International Real Estate Stocks: A Review of the Literature. *Sage*.
- Stanley, M. R. (2017). A Study of the History of Cryptocurrency and Associated Risks and Threats. *Utica College ProQuest Dissertations Publishing*, 1-24.
- Sun, J., Zhou, Y., & Lin, J. (2019). Using machine learning for cryptocurrency trading. *Shenzhen Environmental Science and New Energy Technology Engineering Laboratory*, 87-100.

- Susan Hudson-Wilson, F. J. (2022). Why Real Estate? *The Journal of Portfolio Management*, 145-174.
- Thakur, K. K. (2020). Cryptocurrency: Its Risks And Gains And The Way Ahead. *Department of Accountancy, Gauhati Commerce College (Gauhati Univeristy)*, 27-53.
- Ujan Mukhopadhyay, A. S. (2016). A brief survey of Cryptocurrency systems. *14th Annual Conference on Privacy*, 745-752.
- Webb, J. (2021). Assessing Risk for International Real Estate Investments. *Journal of Real Estate Research*, 85-134.
- Wurtzebach, J. S. (2019). Is Value - Added and Opportunistic Real Estate Investing Beneficial? If So, Why? *Journal of Real Estate Research*, 19-52.
- Yahoo! (2023). *Bitcoin USD (BTC-USD) price, value, news & history*. Yahoo! Finance. Retrieved January 11, 2023, from <https://finance.yahoo.com/quote/BTC-USD/>
- Yukun Liu, A. T. (2016). Risks and Returns of Cryptocurrency. *The Review of Financial Studies*, 2689-2727.
- YUKUN LIU, A. T. (2022). Common Risk Factors in Cryptocurrency. *The journal of Finance*, 50-62.