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RESEARCH ARTICLE

Bitcoin Mining in Turkey as an Example of Speculative Entrepreneurship

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Abstract

The main purpose of this study is to determine the dimensions of speculative entrepreneurship for Turkish Bitcoin miners and to determine the motivational factors for becoming entrepreneurs in this area. The study was designed as a qualitative study where data was collected from a sample of 13 Bitcoin miners. The collected data was analyzed and coded thorough thematic analysis. After determining each participant's profile, a narrative analysis was conducted to ensure the integrity of the research. Some of the key common characteristics determined were awareness, arbitrage, and high-profit expectations, whereas the self-manipulation feature was determined to be low. The key motivation for Participants for investing in Bitcoin was the absence of central management, the beginning of a new financial structure outside the existing system, the opportunity for absolute privacy, and the excessive interest of society, which would serve as a leverage for arbitrage, with high profit expectation. With their increased level of awareness and knowledge, Bitcoin miners saw the opportunity for arbitrage. As speculative entrepreneurs, Bitcoin miners were aware of the extreme nature of the risk of investing in Bitcoin to gain highly desirable and expected profit by using the arbitrage opportunity in the existing system.

Keywords

Entrepreneurship, Speculative Entrepreneurship, Arbitrage, Cryptocurrency, Bitcoin Mining

Introduction

Today, entrepreneurship is considered an important source of development, competitive advantage, and efficiency (Kritikos, 2014). Due to these underlying reasons, it has found an important place in the objectives and programs of governments, companies, and universities (Estrin, Korosteleva, & Mickiewicz, 2013), and therefore projects related to this entrepreneurship have been supported by these organizations and governments alike in recent years (Oylumlu, 2019). Classes are offered in schools to develop entrepreneurship thanks to support given by the Government (Olssen & Peters, 2005), and unconscious encouraging signals from different sources in daily life also contribute to the development and strengthening of

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individuals' innovative and entrepreneurial aspects (Eken, 2018; Zhang & Acs, 2019). We have witnessed through time that new products and services are emerging as a result of the entrepreneurship that has been changing the ecosystem and our daily and business life. Today, the ecosystem of cryptocurrencies, called Bitcoin, is a prominent example of the innovative products and services that have attracted the attention of governments, organizations, and individuals. Bitcoin has become the center of attention due to its global infrastructure supported by internet technologies, the privacy and convenience it provides to users, and its rising and fluctuating price in a short period (Arı, Yelgen, & Uçak, 2022).

Fluctuations in Bitcoin value cannot be explained by existing theories and models (Öztürk, Arslan, Kayhan, & Uysal, 2018) because of its speculative character. In this unstable ecosystem of cryptocurrencies, an actor is performing important functions, including the production and infrastructure services of Bitcoin, which does not have a central management, production, and registration system. To become a Bitcoin miner, one must make an investment in the establishment of the coin production system. A miner can only produce and provide services after having the required tools and infrastructure.

It is determined that today's educated young entrepreneurs aspire to make more money in a short period (Lechner et.al., 2018), and therefore they are especially interested in high-tech jobs that offer a high income (Fassin & Drover, 2017). In conversations with Bitcoin miners before the research, it was noted that Bitcoin miners are motivated to earn more money in a short period in an ecosystem of crises and high fluctuations, rather than establishing a stable business in the conventional environment. These entrepreneurs are aware that a new ecosystem has been formed outside of the existing system, which is speculative and very risky but offers a high return probability. Although Bitcoin mining is not the primary business of miners, they have been considered entrepreneurs because of the investment they make, the service they provide, and the profit they earn in return.

Literature Review

Speculative Entrepreneurship

Entrepreneurship can be defined as a willingness and ability to gather necessary resources for the production of goods or services to sell with the inherent risks of loss to make a profit (Stenberg & Wennekers, 2005); the entrepreneur can be defined as the person who designs, plans and manages this entrepreneurship process and sees it as his or her job. Common characteristics of entrepreneurs are the ability to assess the needs in the market, the acceptance of the risk of profit or loss as a result of their undertakings, and the motivation of self-interest and benefit (Bacq, Hartog, & Hoogendoorn, 2016). It is natural to have more than one kind of the same product or service or its equivalent in the free market economy. Another important

phenomenon of the market economy is arbitrage. Selling the same product at different prices in different markets can be a source of profit. Kirzner (1979) defines those who invest by using the arbitrage opportunity in the market as "speculative entrepreneurs."

Within the scope of speculative entrepreneurship, arbitrage refers to many sources in a broad sense beyond being an economic term. The entrepreneur with a greater level of awareness can predict the present and the future simultaneously (Harper, 2003) and thus can invest according to the assessment. Realizing the awareness of a phenomenon with leverage and the arbitrage opportunities it provides, the entrepreneur collects and invests the necessary resources, even in a risky market (Douhan, Eliasson, & Henrekson, 2007).

Some of the key characteristics of the basis of arbitrage are the presence of a new or differentiated product, service, production process, organizational structure, or religious, national, political, or social situation. The speculative entrepreneur can thus provide arbitrage opportunities by redefining and differentiating the product or service, even if similar products and services are available in the market. The speculative entrepreneur uses leverage as an opportunity for arbitrage throughout the entrepreneurship process (Keyhani, 2019).

To be able to determine the *features that distinguish speculative entrepreneurship from other entrepreneurs*, we must first start by defining the characteristics of entrepreneurship. Wales and colleagues (2016) examined 128 articles on entrepreneurship**,** and according to the result of the study; they determined that out of 128 articles, 98s discuss characteristics such as innovation, proactivity, and risk-taking, which were common features of entrepreneurship. Awareness, arbitrage, self-manipulation, and aiming for high profit are additional dimensions of speculative entrepreneurship (Kirzner, 1973; Kirzner, 1979; Kirzner, 2001; Uymaz, 2020).

Bitcoin Mining

During the 2008 global financial crisis, Bitcoin was launched as a cryptocurrency by Satoshi Nakamoto as a new tool to eliminate financial intermediaries in all types of commerce and payment systems and to avoid inflation caused by the printing of unbacked money by governments. Nakamoto (2008) states in his Bitcoin Manifesto that an electronic payment system is needed which is based on cryptographic evidence instead of a trust-based exchange in e-commerce, providing fast, cost-free money transfer and trade security between the counterparts without the need for validation by a third party. Bitcoin has been created to simplify the trading process, reduce costs, and enable the transfer of money easily between parties anywhere in the world.

If we look at the history of Bitcoin, "Bitcoin.org" was established on August 18, 2008. The Bitcoin Genesis Block was published on January 3, 2009, and the mining system was opened so that 21 million Bitcoin could be produced from January 9, 2009 to 2040. Although

the amount of Bitcoin (cryptocurrency) produced depends on certain rules, it is not produced in a particular center and is not managed centrally. This initiated the creation of the worldwide Bitcoin community (Baumann, Fabian, Lischke, 2014).

On October 5, 2009, the first Bitcoin/US Dollar exchange rate was created by New Liberty Standard (2019) and announced as 1309.03 Bitcoin = 1 USD. The currency calculation was based on the electricity usage cost for the production of Bitcoin.

There are two actors in the Bitcoin market. The first is Bitcoin miners who make the necessary investments with their resources and create Bitcoin blogs with blockchain technology, thus producing Bitcoin and keeping the registration system safe. The other is users who buy Bitcoin with other currencies and use Bitcoin in payment and money transfer transactions. The infrastructure, with no central production, management, and registration system, is needed to produce Bitcoin, and the service of keeping transaction records is provided by Bitcoin miners. A Bitcoin miner is an entrepreneur who invests in the Bitcoin production system. To be in the Bitcoin system, miners are required to provide high-capacity computers, internet access, a cooling system for keeping the temperature at a certain level, and uninterrupted electrical infrastructure. For high production capacity, they can have a high capacity system or cooperate with other miners to establish a production network.

When the profile of miners who play a vital role in the Bitcoin system worldwide are examined, a common profile emerges of their general characteristics: they have a high level of education, work in white-collar jobs, do not see Bitcoin mining as a full-time job (as shown in Table 1), and are considered to be a low-risk group by financial institutions. Bitcoin miners can be active doctors, teachers, writers, engineers, judges, lawyers, officers, police officers, businessmen, or students. Although these people work full-time in different jobs, they can also operate as Bitcoin mining entrepreneurs.

Bitcoin production cost varies by country after Bitcoin miners establish the infrastructure required for production (Sapkota, & Grobys, 2020). It is observed that the low price of electricity, which is the most important factor in production costs, causes mining concentration in some countries, and Bitcoin mining has started to use more energy than some countries (O'Dwyer & Malone, 2014). On the other hand, the income that miners make with their investments in Bitcoin, which they earn every four years in return for uninterrupted and error-free service, is 25 Bitcoin initially and decreases year by year (Baur, Hong, & Lee, 2018).

Bitcoin miners have invested in such a system that they cannot control anything other than being in the system or leaving completely, and they have to adapt to the changing conditions. They are actor entrepreneurs who play the defined role. The internet can provide individuals with real and virtual opportunities to live more than one identity and life simultaneously. Before the research was carried out, it was observed that expectations of high income expectations always come to the forefront in interviews conducted with Bitcoin miners.

Research questions such as "*How can white-collar professionals also become entrepreneurs?*" and "*How can individuals in the low-risk category invest in a high-risk area*?" have emerged based on impressions from previous interviews and readings about Bitcoin. Therefore, the purpose of this study is to determine the factors that motivate people to invest in becoming Bitcoin miners and what kinds of entrepreneurs they are. It has been observed that the collected data matches up with the speculative entrepreneurial characteristics (Kirzner, 2001) that have not been studied much in the literature. This study was designed to examine the decisions and behaviors of Turkish Bitcoin miners in terms of speculative entrepreneurship. *"What are the variables that turn white-collar workers into entrepreneurs?"* and *"What dimensions of speculative entrepreneurship stand out in these investors?"* were determined to be the research questions.

Research Methodology

Method

Even though Bitcoin mining is a full-time service, the low number of Bitcoin miners makes it difficult to reach them because they do not use their real names for Bitcoin mining and they are not registered or identifiable in any way. Therefore, this study was designed as a qualitative study to obtain in-depth data from a small number of people.

Kvale and Brinkmann (2009) emphasize that the most important reality is what people perceive. Therefore, the phenomenological approach was adopted in the study. The phenomenological approach is the method adopted to describe the approaches, perceptions, and meanings participants have attributed to a phenomenon. The phenomenological approach primarily tries to define, understand, and explain the situation experienced by the participants to discover the common meanings underlying the phenomenon (Kocabıyık, 2016).

In order to understand the thoughts and experiences of Bitcoin miners from their perspectives, this study probed why they invest in Bitcoin mining, how Bitcoin affects the economic and social structure, and their predictions and expectations. Follow-up questions on the Bitcoin manifesto, technical infrastructure, and ecosystem, and the factors that motivate miners were asked to deepen the issue. This data collection method provides the flexibility for new and unpredictable data. The aim was to compile detailed thoughts about Bitcoin mining. Interviews with the participants were conducted face to face or by phone. Since participants were geographically spread out, did not want to allocate time for the interview, or did not want to be recognized as a Bitcoin miner, data was collected with the most appropriate method possible. During the interviews, notes were taken by the researchers to record the interviews. The interviews took a minimum of twenty minutes to a maximum of ninety minutes. A fair copy of the notes was made immediately after each meeting to avoid the loss of data, and a total of 96 pages of data were collected from 13 Bitcoin miners.

Research Sample

Bitcoin miners who are producing Bitcoin and maintaining the system with their investments were chosen as the main population of this study. Participants were selected by the typical case sampling method as the aim was to understand the typical, general, and average status of Bitcoin miners (Patton, 2015). Firstly, the purpose and scope of the study were explained to the Bitcoin miners and those who agreed to participate were included in the study. Other Bitcoin miners were reached through references from participants, which is a snowball sampling technique. Research data were collected in 2019.

Demographic Characteristics of the Participants

A total of 13 Bitcoin miners, one of whom was female, participated in the study. In terms of the academic degrees of the miners, eight of them were undergraduates, while the other five were graduates, two of whom have doctoral degrees. Twelve participants already had a full-time job, whereas one of the participants was looking for a job. All the Bitcoin miners had covered the investment capital fully from their savings. One of them is investing to maintain a regular income, while others are aiming to earn high profits in the medium term.

Table 1

Characteristics of Bitcoin Miners

	Gender	Age	Academic Degree	Currently Working or Not?	White-Collar or Blue Collar Work	Full Time or Part Time Employee	Source of Investment
M1	Male	28	Undergraduate	Yes	White Collar	**Full Time**	Own Savings
M2	Male	29	Graduate	Yes	White Collar	**Full Time**	Own Savings
M3	Male	27	Undergraduate	Looking for a job	White Collar	**Full Time**	Own Savings
M4	Male	32	Undergraduate	Yes	White Collar	**Full Time**	Own Savings
M5	Male	31	Undergraduate	Yes	White Collar	**Full Time**	Own Savings
M6	Male	26	Undergraduate	Yes	White Collar	**Full Time**	Own Savings
M7	Male	40	Undergraduate	Yes	White Collar	**Full Time**	Own Savings
M8	Male	29	Undergraduate	Yes	White Collar	**Full Time**	Own Savings
M9	Female	29	Graduate	Yes	White Collar	**Full Time**	Own Savings
M10	Male	36	Undergraduate	Yes	White Collar	**Full Time**	Own Savings
M11	Male	31	Graduate	Yes	White Collar	**Full Time**	Own Savings
M12	Male	35	Graduate	Yes	White Collar	**Full Time**	Own Savings
M13	Male	37	Graduate	Yes	White Collar	**Full Time**	Own Savings

Data Analysis

Firstly, thematic and narrative analysis was carried out on the data obtained from the interviews with the participants. For thematic analysis, inter-coder consistency (Miles & Huberman, 1994), peer assessment (Lincoln & Guba, 1986), and participant assessment (Creswell & Miller, 2000) were applied to ensure the credibility of the study in terms of validity and

reliability (Auerbach & Silverstein, 2003). Speculative entrepreneurship themes were defined according to the literature. Thematic analysis is an analysis method wherein themes in the data collected from each participant are analyzed (Carvalho, Costa, Lykke, & Torres, 2018). Although the names of the participants were not shared in the research, Bitcoin miners were each given a code (M1, M2, M3, ...) to share which data, attitude, or behavior came from which participant. As a result of the thematic analysis, the personal profile of each miner shared in Annex 1 was also created. Thematic analysis of the data collected from the participants was carried out in five stages:

1. *Creating a coding table* following speculative entrepreneurship themes, including awareness, arbitrage, self-manipulation, and high-profit expectation. Afterward, the table was assessed by two academicians who have researched entrepreneurship and qualitative analysis and took part in the content-coding for expert review. Corrections were made according to their feedback.

2. *Coding the data in line with the themes* (Yıldırım & Simsek, 2016). In addition to the researchers, the coding process was carried out by four academicians who have knowledge of or who work on Bitcoin, one of whom has a Ph.D. in financial economics and three of whom have Ph.Ds. in business administration. Before coding, the coders were informed about the speculative entrepreneurship themes (awareness, arbitrage, self-manipulation, and high-profit expectation). The consistency of coding (i.e. the extent to which different researchers or analysts agree on how to code the same content) was found to be 85%. This result shows a degree of neutrality or the extent to which the findings of a study are shaped by the respondents and not researcher bias, motivation, or interest.

3. *Digitizing.* Then the data was digitized by giving a value for each determination under the themes, and their frequencies were determined. Frequencies were converted to a percentage. Each finding was placed under a theme and the miner profiles were constructed. As a result of the analysis, the average Bitcoin miner profile (Figure 1) and individual Bitcoin miner profiles (see in Appendix 1) were constructed according to the themes.

4. *Narrative analysis*. Thematic analysis at the individual level is not sufficient to ensure the integrity of the study as qualitative analysis (Braun & Clarke, 2006). After the thematic analysis, narrative analysis was conducted with a holistic approach. Carrying out a narrative analysis is defining and interpreting the findings according to themes (Patton, 2015). While narrative analysis ensures the integrity of the subject, it also allows researchers to see individual differences, utilizing the quotations from the participants in the explanation of the themes (Carvalho, Costa, Lykke, & Torres, 2018). The purpose of the narrative analysis is to be able to describe the big picture. Afterward, the participants evaluated the analysis of the data collected and the comments made, and necessary edits and arrangements were conducted based on their feedback. Finally, the analysis was sent to an external academician who studies

entrepreneurship and qualitative analysis for assessment again and necessary adjustments were made according to his feedback.

Findings

The profile of each participant given in Annex 1 was obtained and then a general Bitcoin miner profile emerged, as seen in Figure 1. Following this, narrative analysis was carried out according to the themes, which consisted of speculative entrepreneurship sub-dimensions.

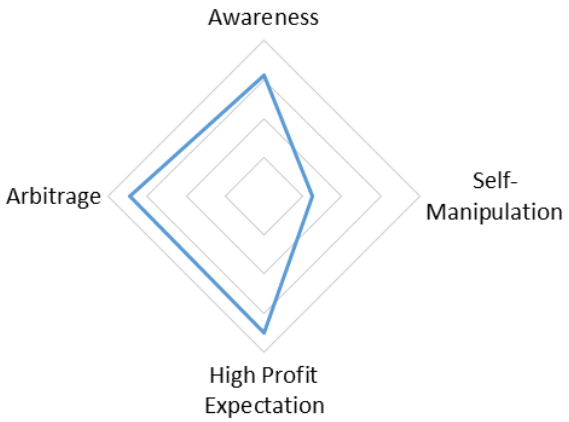

Figure 1. Average bitcoin miner profile.

Awareness: Kirzner (1999) defines awareness as the basis of the entrepreneurship process. Awareness is the situation arising from the knowledge the entrepreneur possesses, which forms the basis of entrepreneurship and allows the entrepreneurship process to be created. Based on the fact that 9 of the 11 miners who read the Bitcoin manifesto are effective in investing in Bitcoin mining, we can say that knowledge creates awareness, and this awareness leads them to become entrepreneurs.

As can be seen from Table 2, only two miners have not read the Bitcoin manifesto, while all the other participants have read it. The Bitcoin manifesto was effective in motivating 9 of the investor readers to become Bitcoin miners. Based on this result, knowledge creates awareness, and this awareness leads them to become entrepreneurs.

It was determined that miners who did not read the Bitcoin manifesto had knowledge about Bitcoin, and one of the participants had advanced knowledge in the field of economics and finance. Again, the participants had a significant level of knowledge about Bitcoin before investing, this knowledge created awareness, and this awareness led them to become entrepreneurs.

The content of the knowledge that creates awareness is made up of the determination of gaps, errors, and imbalances in the market (Kirzner, 1999). Bitcoin miners also determined the inadequacy and gaps of the current financial system. M6 stated that the current system cannot meet the needs and there are gaps: *"The current system's tools and institutions are inadequate, especially in the face of economic and financial crises and change. Searching for alternatives outside the current system, whether legal or not, strengthens Bitcoin or other cryptocurrencies. Some people want to transfer large amounts of money, and to act flexibly outside the system. This has been so for years. The manipulation of some causes the strengthening of such instruments, not a dark web but a living, visible formation. As long as global financial crises occur, there will be a demand for any instrument that protects wealth, provides privacy, and also provides unlimited, easy, and fast transfer of value. There is no doubt that it would be reasonable to invest in this."* These determinations are indicators of the knowledge and awareness that the miner has. M7 was also aware that there are gaps in the existing system and the need for a new system is, naturally, quickly accepted: *"Bitcoin is an alternative to all printed money. The high interest and demand boom is an indicator of the need for a new system beyond money."*

Table 2

Knowledge Levels of Bitcoin Miners

	Bitcoin Manifesto	**Bitcoin Ecosystem Knowledge**	**Technical Knowledge of Production System**	**Determination of Production System Specifications**	**Bitcoin Blog Writer / Follower Status**	**Bitcoin Mining Purpose**
M1	Read	Advanced	Advanced	Own decision	Daily Follower	Invest.
M2	Read	Advanced	Advanced	Own decision	Daily Follower	Payment + Invest.
M3	Read	Advanced	Advanced	Own decision	Daily Follower	Payment + Invest.
M4	Read	Advanced	Advanced	Own decision	Weekly Follower	Invest.
M5	Not read	Basic	Basic	Ready system	Weekly Follower	Invest.
M6	Read	Advanced	Basic	Ready system	Irregular Writer/ Daily Follower	Payment + Invest.
M7	Read	Basic	Basic	Own decision	N/A	Invest.
M8	Read	Advanced	Advanced	Own decision	Irregular writer/ Daily Follower	Payment + Invest.
M9	Read	Advanced	Basic	Ready system	Irregular writer/ Daily Follower	Invest.
M10	Read	Advanced	Advanced	Ready system	Irregular writer/ Daily Follower	Payment + Invest.

	Bitcoin Manifesto	**Bitcoin Ecosystem Knowledge**	*Technical Knowledge of Production System*	**Determination of Production System Specifications**	**Bitcoin Blog Writer / Follower Status**	**Bitcoin Mining Purpose**
M11	Read	Advanced	Basic	Ready system	Daily Follower	Payment + Invest.
M12	Not read	Advanced	Basic	Ready system	Daily Follower	Invest.
M13	Read	Intermediate	Intermediate	Ready system	Irregular Follower	Payment + Invest.

M12 had determined the gaps and deficiencies of the current system and was aware of the advantages provided by Bitcoin: *"Financial freedom and liquidity protect the value of money in economic crises. The traditional financial system is managed by the state or banks, which have absolute power. This is a new system in which no authority can block, and the power in the system is distributed equally to everyone. Its popularity, the expansion potential of its areas of use, especially the protection of wealth, and its ability to transfer quickly are extraordinary advantages."* These determinations and interpretations are indicative of the miners' high awareness.

Although other people may have the same knowledge, they do not have the awareness, which is the source of entrepreneurship, because they interpret the given information differently. Shane and Venkataraman (2000) consider individuals who know but are not aware to be unsuccessful in terms of entrepreneurship. Entrepreneurship that emerges through awareness is a result of the creative aspect of the individual and a situation where other individuals fail. According to M9, *"News about Bitcoin attracts society's attention."* The general public is aware of Bitcoin because of its high price and the fluctuation of its price over time. However, many people do not invest in becoming a miner. Although M7 has read the Bitcoin manifesto, his knowledge of the ecosystem is at a basic level. But the source of his interest in becoming a Bitcoin miner was the news. Due to the effect of the news, Bitcoin attracted his attention and he realized that something was changing. *"I am mining both to wonder and 'carpe diem,' and so as not to say 'I wish I had…' in the future,"* he said. Organizations' attitudes towards and behaviors regarding Bitcoin support the change in the market. For example, in October 2010, The Financial Action Task Force (FATF), which is an anti-money laundering and sanctions expert working group under OECD, published a report on cryptocurrencies. In this report (2010), FATF announced to all authorities that Bitcoin is a new entity that can completely change the global financial structure, making it impossible to control or manage the flow of money. This report caused a wave of interest in Bitcoin. In June 2011, the value of 1 Bitcoin was 31.91 USD (Yahoo Finance, 2020). Bitcoin miners are aware of this development. M5's statements confirm this situation: *"Bitcoin is considered as an alternative that can be an alternative even to central banks. However, an unlimited opportunity for liquidity provides serious wealth accumulation and transfer."* M6 said, *"It is not Bitcoin itself but the block-*

chain technology, so even if Bitcoin fails, another similar instrument will succeed." Although a gap is detected in the system, it is emphasized that a similar instrument will be successful even if Bitcoin fails. Miners are aware that a new formation has begun and this formation has opportunities for investors.

Awareness is a subjective phenomenon (Uymaz, 2020). Even if the information is open to everyone and can be known by others, its interpretation, explanation, and formation are subjective. In this case, it is not expected that everyone with the same knowledge will have the same level of awareness and that everyone will become an entrepreneur. What is the result of awareness is the result of the entrepreneur's subjective and creative aspect. An entrepreneur describes a speculative thing as reality with entrepreneurial awareness (Murray, 2018). M7 sees Bitcoin as an agent of another system that occurs outside the existing system: *"The footsteps of a different structure or system can be seen as its representative."* Bitcoin miners who invest with awareness ensure the existence and expansion of the system. Bitcoin miners transform Bitcoin from being speculative to a real instrument. It is the speculative realism that turns an individual into an entrepreneur (de Monthoux, 2015).

Awareness is a situation that is active at all stages of the entrepreneurship journey and its content is constantly updated. As knowledge changes, awareness, and then entrepreneurship change too. According to M12, *"As the interest of institutional investors increases, balance will be achieved, but individuals' impulsive behavior towards being rich and the regulations made by governments cause price fluctuations."* M3 has important information about the attitudes and behaviors of the actors in the Bitcoin ecosystem: *"The investors and especially long-term investors with the 'hold' strategy strengthen the possibility of arbitrage. Especially long-term investors' long-term keeping strategy, which is the 'hold strategy,' raises the possibility of arbitrage. Whale Anon Larp and Asuka Chan's monthly price estimates were right. They estimated January, April, and July 2019 prices correctly. One cannot help thinking that the strings are in someone's hands. I know it's both easy and also hard to believe."*

It is seen as an advantage that the Bitcoin trading and production system is not central and under the control of the states. However, the differing attitudes of governments towards Bitcoin and miners create discomfort. According to M3, *"For example, the Turkish government's approach may change. The wind can reverse direction, and governments may agree and say, 'Come on, guys, let's finish these crypto players.' Can they say this? Why not?"* These observations also showed that he was aware of the risk. He thought that using his real name may cause trouble in the future, so he trades under a pseudonym. Along with the opportunity of Bitcoin mining, miners are aware that it contains risks arising from the ambiguous attitude of the governments, including Turkey's (Çakracıoğlu, 2016).

The miners decide on the entrepreneurial initiative to start, continue, and even terminate based on their awareness (Uymaz, 2020). M4 confirms this fact: *"Stock market manipulati-*

ons and Bitcoin news in the media have a significant impact on community psychology. Someone wants to become rich in a short time. All these cause the Bitcoin price to rise. It affects not only Bitcoin but also interest in other cryptocurrencies. The perception as an alternative to gold and foreign currency increases. Naturally, there is the possibility of falling as much as the price increases. Big players do not use Bitcoin as a hedging instrument. I think when they use it, there will be no such fluctuations. But some people certainly have huge amounts." Miners do not just focus on features and product usage. They are also knowledgeable about their impact on the ecosystem. If the arbitrage possibility is high, the probability of profit disappears, or the attitude of the state changes, most miners stated that they do not want to continue mining.

Bitcoin miners have invested in a structure that does not have interventions and controls, and are aware that the system they serve also has a high risk and return probability. Miners can generally produce and do transactions without using their real names and credentials, and even prefer this because Bitcoin mining is prohibited in some countries, in some places resulting in prison sentences.

Arbitrage: Arbitrage is defined as the existence of different equilibrium prices in different markets related to any security. Arbitrage is the purchase of securities from the market where it is cheaper and selling them in the market where it is more expensive to obtain profit (Dubil, 2009). Kirzner (1979) discussed the concept of arbitrage in a broader sense, rather than approaching it from its narrow meaning in finance. The entrepreneur, who offers similar services and has the awareness to differentiate and decompose can redefine a product or service, differentiate the equivalent product, and reposition it in the market. This repositioning can be the source of arbitrage that means a high level of profit. The source of arbitrage is the openness and imbalance in many areas in the market, especially the price (Kirzner, 1973). These imbalances, some of which are already present and some of which are artificially created by speculative entrepreneurs, create an opportunity for arbitrage and high profits.

The source of arbitrage can be a new product, production, or service system, or it can be because of the use of an economic, religious, national, political, or social phenomenon as leverage (Uymaz, 2020). The primary arbitrage opportunity for Bitcoin miners is that Bitcoin is not managed by any government or central authority. Miners other than M5 and M8 consider the fact that Bitcoin is not under a centralized system or state control a great advantage. M1 defines a factor for arbitrage by saying, "*the absence of a central government such as a Central Bank in the case of Bitcoin can make it open to speculative movements and manipulation.*" Even though states have attempted to restrict, that caused the price to increase. On July 11, 2010, a commentator with the pseudonym Kdawson (2019) wrote an article titled "*Money outside the intervention of the governments*" on the blog "slashdot.org." This article helped Bitcoin become the center of attention and following its publication, Bitcoin gained 10 times value against the US Dollar within 24 hours.

The second arbitrage opportunity for Bitcoin is the formation of a structure outside the current system. One of the most important things about modern society is the management of money accumulated as wealth or capital. Bitcoin, on the other hand, is a tool or a structure that cannot be controlled with the tools of the current system. As M1 emphasizes, "*The biggest advantage of money transfer is that it can be made easily, without intermediaries, without restrictions and confidentially at the global level.*" Similarly, M2 says, "*Some governments don't want to allow it. I think it looks like a sharing of power. The purpose of protecting the value of money in economic crises and the decreasing trust in banks in the crises leads people to Bitcoin.*" M13, on the other hand, defines Bitcoin as "*an instrument that is not affected by the macro policies and failures of the countries.*" Miners also define the emergence of Bitcoin naturally and inevitably. According to M9, "*Maybe this is natural or this is what should be natural. And, such a new system must be formed. Yes, some situations are overlooked by governments. But they are highly controllable by the system. Governments want to get a share from everything, they behave like the mafia. Bitcoin is an entirely global entity, free from governments' intervention.*" These words reveal that although they are white collar professionals, Bitcoin miners have an anarchist characteristic.

M9 states that organizations other than the governments have also started to show interest in Bitcoin: "*For the end of fluctuation, corporate actors must be players in the market. At the same time, if corporate actors use it as a hedging tool, its price will also increase as the amount of circulating Bitcoin in the market, such as gold, will decrease.*" Organizations have made decisions that support this prediction. While the world's largest futures exchanges, such as the CME Group and CBOE in Chicago, listed Bitcoin, companies such as Microsoft, PWC and Overstock recognized Bitcoin.

M4 emphasized that, "*The fact is that the new system threatens the current system and instruments. It is not only in terms of the government and organizations, but society also has the same perception.*" M4 also said that "*Bitcoin is perceived as an alternative to the banks.*" According to M5, "*It is seen as an alternative to central banks.*" The participants anticipate that this formation will create an important arbitrage opportunity for them in the medium and long term. M10 expressed his expectations: "*We will benefit from this situation. Not millions, but a hundred will suffice*." According to Kirzner (1999), the fact that speculative entrepreneurs make high profits based on a phenomenon with leverage strengthens the gap in the market and ensures that the market will balance.

The third arbitrage offered by Bitcoin is the privacy opportunity. In April 2012, the FBI (2019) published the Bitcoin Report. The report begins by stating that Bitcoin is not managed by anyone; miners and users who are producers are completely anonymous, and it is impossible to identify and monitor all of them simultaneously. Since the money can be transferred completely from one account to another, and the records of users are not in the government

or any institution's registration system, it was emphasized that the current instruments and methods used for managing and controlling are insufficient, so there is a great potential for money laundering and informality and it would draw great interest. M5 and M12 explain that "*Bitcoin provides unlimited liquidity opportunity, easy and secret wealth accumulation, protection and fast transfer,*" while M13 says "*It is portable with a username and password.*" In the months following the FBI report, Bitcoin became 266 USD on April 10, 2013 and 500 USD on November 17, 2013, and two days later it exceeded 1000 USD. The average daily trading volume reached 1.3 billion USD and exceeded 2.15 Billion USD on May 6, 2019 (Yahoo Finance, 2020).

The FBI report findings regarding privacy and money transfer are justified. Today, 44% of Bitcoin is used for black market transactions including illegal goods and services payments and money laundering, and 38% of existing accounts are opened for illegal transactions (Foley, Karlsen, & Putnins, 2018). M4 states that it is quite normal to use Bitcoin for money laundering, illegal payments, and the dark web, as it provides a very high level of privacy and ease of transfer.

Since the Bitcoin system is also seen as an instrument of identification, there are already miners who are happy to be a part of this system. M7 explains his satisfaction this way: "*Bitcoin is attractive, just like having a desired identity in the virtual world.*" Bitcoin mining is seen as an alternative, a means of transition, and being included in a secret habitat.

Another arbitrage opportunity is the interest of a society that is against Bitcoin. M4 emphasizes that stock market speculations in the media and the news on fluctuations in Bitcoin price have a great influence on the attitude of society towards Bitcoin. M9 confirms this: "*The news about the price of Bitcoin in social media, newspaper or television is overwhelming for people; the high earning probability and expectation caused by the news fuels the enthusiasm of investment for many people.*" M1 emphasizes that this situation is reinforced by celebrities (such as Elon Musk): "*Worldwide celebrities that act as sponsors, even if they are not official, provide position as a global digital gold.*" M4 sees this as the effect of perception in society: "*Many people want to get rich in a short time. These cause the Bitcoin price to rise. This ensures that it is perceived as an alternative instrument to gold and foreign currency.*" M5 emphasizes that this situation will not end in the short term: *"Being open to manipulation, and the speculative movements that are already taking place cause price fluctuation. I don't think this fluctuation will become balanced soon."* M8 emphasizes that Bitcoin fluctuations will not end, that it will be on society's agenda, and that some people will exhibit opportunistic behavior: *"Global transfer of money is effective in increasing the price of Bitcoin. This can also be black money. One group is opportunistic making money from fluctuations, while another group is clueless and dreams of becoming rich. The Bitcoin market already offers arbitrage opportunities; I don't think this will end soon."*

Self-manipulation: A rationalization process may be required to accept conflict between religious, national, and social values, uncertainty, and risk. An attitude change and rationalization process may be required to make the necessary decisions, to act, and accept the results to realize the vision it has built. Thus, operating in a high-risk environment with many uncontrollable factors may not be considered rational at all.

The entrepreneur intends to achieve her/his goals. The absence of serious measures preventing the individual, who is motivated by his/her goals, also strengthens self-manipulation. The speculative entrepreneur may need to develop new attitudes and behaviors to achieve her/his goals and accept the results. Self-manipulation is the rationalization of new behaviors, attitudes, and outcomes that will be required for achieving the vision (Mallin, & Serviere-Munoz, 2013). In the rationalization process, new attitudes are formed to support the decisions and behaviors necessary for the goals. At this stage, the entrepreneur is motivated by the effect of the benefit and will make a profit when her/his enterprise is successful. According to the "finder-creator-keeper" (Kirzner, 1973) principle, the speculative entrepreneur sees a reward as his/her right, because the entrepreneur has achieved what someone else did not think of or dare.

Skyes and Matza (1957) define this neutralization process as a childhood dilemma. It is the process of neutralizing and rationalizing behaviors and outcomes. Denial of responsibility, denial of loss, denial of the sufferer, condemnation of condemners, and appeal to higher loyalties are 5 methods of neutralization (Polding, 2017).

Three of the miners stated that they did not know that Bitcoin was used for illegal purposes; just one of them said that they knew and were not happy with this. M4 stated that money laundering, illegal payments, and using Bitcoin on the dark web are perfectly normal; this does not bother him, and he does not have any concerns that his work is wrong or serves the wrong business. He also condemned those who condemn Bitcoin miners: "*If Bitcoin does not exist, will the illegal activities be over? The answer is 'no', of course.*" They believe that even if Bitcoin did not exist, other instruments could sustain illegal activity. M1 explains: *"If there is potential, it will be used."* Even though M13 stated that he was disturbed, he said the following: "*Do I know that almost 50% of Bitcoin transfers are being conducted in the payments of illegal activity? Does it bother me? I don't know. This situation partially bothers me. But, according to my research, illegal money transfers in Bitcoin are less than illegal money transfers in USD."*

M5 stated that Bitcoin is already used in illegal activities, and knows that it will be used more intensively. Investing in Bitcoin is not about supporting a wrong cause, but rather it is a good investment for him. After asking, "*Which should be preferred: social benefit or personal benefit?*" he states that he sees his values as a priority through the idiom "*charity begins at home*."

M6 chooses condemnation and denial of responsibility in the rationalization process: "*We are producing in a network. I am not the only one.*" He is highly aware that the ecosystem already offers arbitrage opportunities. He stated that Bitcoin is used for illegal activities, but he does not have any idea of the amount. He emphasized that this situation did not disturb him and that it did not affect his decisions. M6 also sees personal value and benefit as a priority.

M8 knows that Bitcoin is used for illegal work in high volume, but reported that he is not happy with this use. However, he stated that this volume will decrease with the increase in the number of cryptocurrencies, and the other fiat currencies such as USD or Euro are also used in illegal activities even they are more popular. Since a person does not want to change his/her behavior, he/she changes his/her attitude and rationalizes it through self-manipulation.

M12 sees this situation as follows: "*Although I am not very knowledgeable about illegal use, Bitcoin does have a role in breaking the dominance of USD.*" He stated that, although using Bitcoin for illegal activities creates discomfort, there is no situation in which he would give up mining. He sees his values as more important and states that he wants to end the domination of the USD. He practices self-manipulation by prioritizing his values.

M13 stated that Bitcoin is used in many fields, so naturally, it can be used in the black market. This usage is not as much as the USD, therefore he does not create any potential harm to society and he is not uncomfortable with this. He emphasizes that Bitcoin mining does not cause suffering and does not lead to a loss.

A similar rationalization is also seen in people. It has been determined that people have decided to commit crimes as a result of rational choice with cost-benefit analysis (Çalı & Tombul, 2014). There is no need for a crime to emerge in speculative entrepreneurship. The rationalization process takes place in the conflicts caused by the decisions and behaviors of speculative entrepreneurs and their results. Although this rationalization process is not mentioned by the entrepreneur, the entrepreneur can disclose this through his decisions and behaviors (Kirzner, 1999).

High-Profit Expectation: The speculative entrepreneur has a high-profit expectation in return for his awareness and his risk-taking endeavor. If entrepreneurship is successful, the result is the realization of profit and benefits for the entrepreneur. Kirzner (1979) emphasizes that the market renews itself through the decisions and behaviors of entrepreneurs, and the entrepreneur will try to maximize profit in this process. Bitcoin miners also predict high returns by evaluating the possibility of profit and loss by being part of the system.

M3 states that the Bitcoin price may drop to completely zero, while miners generally predict that the lowest average price could be 5,000 USD. The highest estimate is anticipated by M5, M9, and M10, who say that a Bitcoin could be worth 1,000,000 USD. Generally, miners predict that the highest price will be 100,000 USD. M3 stated that "*Bitcoin can exceed*

100,000 USD, while the bottom line maybe 1 USD. ROI looks great. But if it is 1 USD...?" and added, "*The biggest risk I took is losing my investment.*"

In December 2013, Bitcoin lost 20% of its value in one day after the Chinese Central Bank announced that it did not recognize Bitcoin as a currency. In the following years, 1 Bitcoin increased to 20,000 USD in December 2017 and decreased to 3,000 USD in December 2018 (Yahoo Finance, 2020). Short and medium-term Bitcoin price fluctuations are expected to continue because estimates of possible prices vary so widely. Experts' estimate for the highest price Bitcoin may reach in the future is that 1 Bitcoin will be 700,000 USD (Cuthbertson, 2018). The Winklevoss brothers, who took part in the creation of Facebook, predicted in an interview with CNBC in February 2018 that then current price would increase 40 times and the Bitcoin market would reach a size of 5 trillion USD (Kharpal & Gamble, 2018).

Mises (2012) said that managers can make high-risk decisions in capital utilization. Like executives, the speculative entrepreneur can make high-risk decisions that endanger both capital and other stakeholders. The reason for taking a high risk is primarily the expectation of higher earnings. Although it seems to be the responsible assumption, the high profit to be earned in return for the great risk is seen by speculative entrepreneurs as a reward for their awareness and the risk they take (Kirzner, 2001). The Bitcoin ecosystem, price fluctuations, and high price predictions serve as an incubator that allows the emergence and strengthening of the speculative entrepreneurship of Bitcoin miners.

Discussion

It is found that Bitcoin miners have an outstanding awareness stemming from their knowledge. Even though many others have the same level of knowledge, it would not be incorrect to propose that the reason these miners are investing in Bitcoin mining is because of their ability to interpret information very differently than others. Awareness formation for entrepreneurship is contingent. According to our observations, decisions made by Bitcoin miners are not the results of momentary observations. It is understood that Bitcoin miners do not make their investment decisions quickly, but that their investment decisions are based on forecasts, with multiple different factors derived from different sources. It is also observed that in addition to Bitcoin mining, these entrepreneurs also have substantial knowledge of finance, economics, psychology, and political science, as well as awareness stemming from these areas of expertise.

From the sample of thirteen miners, two have basic, one has intermediate, and ten have advanced knowledge about Bitcoin and its ecosystem. Their forecasts regarding arbitrage, namely the factors causing increases in prices, result from their knowledge and awareness of different sectors. It is evident that their awareness, resulting from knowledge gathered

from other sectors, strengthens their entrepreneurship abilities and motivates them to invest in Bitcoin mining. In terms of entrepreneurship, it is reinforced by awareness resulting from knowledge gathered in other sectors. Awareness about other sectors made these miners realize the arbitrage opportunity in Bitcoin, but instead of becoming Bitcoin investors, it led them to develop a higher awareness and become Bitcoin miners.

It can be proposed that arbitrage opportunity is the most significant factor for speculative entrepreneurship. The reason for this is that what motivates an entrepreneur is the identification of factors that might lead to achieving the defined objectives. Bitcoin miners expect that Bitcoin prices will increase since it is perceived as digital gold, and because of its ability to move outside the existing system by offering flexibility, ease, and privacy. Even though all miners state them differently, many leverages providing high profits have been identified though the economy and social transformation provide arbitrage opportunities in Bitcoin.

Arbitrage opportunities provide higher profits to risk-taking investors. In general, Bitcoin miners aim to earn high profits in the middle and long term. In the course of reaching these goals, they might experience self-manipulation concerning the contradictory situations they live in. Even though they provide services 24/7, 365 days a year, they do not work in physical terms and they do not have to make frequent decisions that facilitate self-manipulation. Miners' awareness that money laundering is not only a result of Bitcoin eases self-manipulation. They believe that even if Bitcoin did not exist, other instruments would sustain illegal activity. Also, many attempts conducted by speculative entrepreneurs might be observed in the market. Many companies with business models that are strengthened by religious and national values, promising high returns and employment opportunities, have collected money from investors through membership and invested in different business lines. Even though some succeeded and even if entrepreneurs made themselves financially successful, they made their members miserable. Just like in the past and present, many speculative activities can and will continue in the future.

It is observed that though Bitcoin miners have powerful traits, like being innovative and proactive, they have a low tendency to take risks because they pay the costs of investment from their own resources. The designated risk of their income is not sufficient to meet their investment costs; not being able to make a profit is an acceptable risk to take. The second important risk is the uncertainty in the policy of state institutions regarding cryptocurrencies. M11, M10, and M7 shared their opinion that even though, unlike other countries, in Turkey Bitcoin is not prohibited by law and there is no risk of imprisonment, generally, inconsistency in state institutions poses uncertainty for the future. The stance taken by states against Bitcoin is different. Some states, like China, prohibited commercial activities fulfilled with Bitcoin; some other states like Venezuela impose penalties, including imprisonment. Other states, like Japan and Australia allow all cryptocurrency transactions, invest in this technology, and study

and incentivize projects financially. Some miners prefer not to use their names due to this uncertainty. Bitcoin miners, as entrepreneurs, aim at benefiting from arbitrage opportunities, accept the risks with a high level of awareness, and make investments to gain high profits. Though individuals are expected to comply with the values and norms of the organizations they are part of, in entrepreneurship, it is evident that personal objectives and expectations are in charge. Today, young and educated entrepreneurs are pursuing large profits, especially in high-tech businesses, and it is the same for the Bitcoin miners. Thanks to Bitcoin mining, white-collar workers have become entrepreneurs as well as becoming alchemists, since printed money is the state's alchemy, and cryptocurrency is the individual's alchemy.

An example of a white-collar entrepreneur is Mr. Anderson (Wachowski, & Wachowski, 1999), who works in a software company as a software expert by day and works with a hidden identity at night coding computer viruses, ready to follow the white rabbit. In the coming years, there will be an increase in the entrepreneurship of white-collar workers. This is because on one side, there is an ecosystem putting forward entrepreneurship together with crises that are becoming permanent, and on the other side there is the desire for an immediate increase in income instead of a sustainable income enabling a chance to become rich in a short period of time. These factors will increase the number of entrepreneurs who seek an arbitrage opportunity.

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References

Ari, Y., Yelgen, E. & Uçak H. (2022). The impact of Covid-19 on the volatility spillover between BIST-BILISIM and cryptocurrencies. In Mansour, N., & Ben Salem, S. (Eds.). COVID-19's Impact on the Cryptocurrency Market and the Digital Economy. IGI Global. (Feb 2022 Forthcoming). https://doi.org/10.4018/978-1-7998-9117-8

Auerbach, C. F., & Silverstein, L. B. (2003). *Qualitative Data: An Introduction to Coding and Analysis*. New York, US: NYU Press.

Bacq, S., Hartog, C., & Hoogendoorn, B. (2016). Beyond the moral portrayal of social entrepreneurs: An empirical approach to who they are and what drives them. *Journal of Business Ethics, 133*, 703-718. https://doi.org/10.1007/s10551-014-2446-7

Baumann, A., Fabian, B., & Lischke, M. (2014). Exploring Bitcoin network, *In Proceedings of the 10th International Conference on Web Information Systems and Technologies – Volume 2: (WEBIST),* 369-374. At: Barcelona, Spain. https://doi.org/10.5220/0004937303690374

Baur, D. G., Hong, K., & Lee, A. D. (2018). Bitcoin: Medium of exchange or speculative assets? *Jour-*

nal of International Financial Markets, Institutions & Money, 54, 177-189. https://doi.org/10.1016/j.intfin.2017.12.004

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Carvalho, I., Costa, C., Lykke, N., & Torres, A. (2018). Agency, structures, and women managers' views of their careers in tourism. *Women's Studies International Forum, 71*, 1-11. https://doi.org/10.1016/j.wsif.2018.08.010

Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory into Practice, 39(3)*, 124-130. https://doi.org/10.1207/s15430421tip3903_2

Cuthbertson, A. (2018, April 26). Bitcoin will replace gold and soar in price to $700,000, says major investors. *Independent*, Retrieved from independent.co.uk: https://www.independent.co.uk/life-style/gadgets-and-tech/news/bitcoin-price-live-gold-value-cryptocurrency-sohn-soros-invest-pfeffer-a8323441.html

Çakracıoğlu, A. (2019, December 1). Kripto Para: BITCOIN [Cryptocurrency: BITCOIN]. Retrieved from Capital Markets Board of Turkey: http://spk.gov.tr/yayingoster.aspx?yid=1130&ct=f&action=downloadfile

Çalı, H. H., & Tombul, F. (2014). Nötrleştirme teknikleri ve kentsel mekanda işlenen hırsızlık suçları: Erzurum alan araştırması örneği [The neutralization techniques and robbery or burglary in urban areas: The case of Erzurum]. *Electronic Journal of Social Sciences, 13*(51), 307-328. https://doi.org/10.17755/esosder.85337

de Monthoux, P. G. (2015). Art, philosophy, and business: Turns to speculative realism in European management scholarship. *European Management Journal, 33*, 161-167. https://doi.org/10.1016/j.emj.2015.03.001

Douhan, R., Eliasson, G., & Henrekson, M. (2007). Israel M. Kirzner: An outstanding Austrian contributor to the economics of entrepreneurship. *Small Business Economics, 29*, 213-223. https://doi.org/10.1007/s11187-006-9041-y

Dubil, R. (2009). *An Arbitrage Guide to Financial Markets.* West Sussex, England: Wiley

Eken, I. (2018). Relationship between generations of entrepreneurs and entrepreneurial traits. *Journal of Applied Business and Economics*, *20*(3), 113-125. https://doi.org/10.33423/jabe.v20i3.341

Estrin, S., Korosteleva, J., & Mickiewicz, T. (2013). Which institutions encourage entrepreneurial growth aspirations? *Journal of Business Venturing, 28*(4), 564-580. https://doi.org/10.1016/j.jbusvent.2012.05.001

Fassin, Y., & Drover, W. (2017). Ethics in entrepreneurial finance: Exploring problems in venture partner entry and exit. *Journal of Business Ethics, 140*, 649-672. https://doi.org/10.1007/s10551-015-2873-0

FATF. (2019, October 25). Financial Action Task Force Report: Money laundering using new payment methods. Retrieved from http://www.fatf-gafi.org: https://www.fatf-gafi.org/media/fatf/documents/reports/ML%20using%20New%20Payment%20Methods.pdf

FBI. (2019, April 24). Bitcoin virtual currency: Unique features present distinct challenges for deterring illicit activity. Retrieved from www.wired.com: https://www.wired.com/images_blogs/threatlevel/2012/05/Bitcoin-FBI.pdf

Foley, S., Karlsen, J. R., & Putnins, T. J. (2019). Sex, drugs, and Bitcoin: How much illegal activity is financed through cryptocurrencies? *The Review of Financial Studies, 32*(5), 1798–1853. https://doi.org/10.1093/rfs/hhz015

Harper, D. (2003). *Foundations of Entrepreneurship and Economic Development*. New York, US: Routledge & Taylor Francis.

Kdawson. (2019, July 10). *Money outside the intervention of the governments*. [Web Log Post]. Retrieved from slashdot.org: https://news.slashdot.org/story/10/07/11/1747245/bitcoin-releases-version-03

Keyhani, M. (2019). Computational modeling of entrepreneurship grounded in Austrian economics: Insights for strategic entrepreneurship and the opportunity debate. *Strategic Entrepreneurship Journal, 13*(2), 221-240. https://doi.org/10.1002/sej.1311

Kharpal, A., & Gamble, H. (2018, February 7). Bitcoin will someday be worth as much as 40 times its current value, says Cameron Winklevoss. *CNBC* Retrieved from www.cnbc.com: https://www.cnbc.com/2018/02/07/winklevoss-twins-bitcoin-will-be-worth-40-times-current-value.html

Kirzner, I. (1973). *Competition and Entrepreneurship*. Chicago, US: The University of Chicago Press.

Kirzner, I. (1979). *Perception, Opportunity, and Profit*. Chicago, US: The University of Chicago Press.

Kirzner, I. (1999). Creativity and/or alertness: A reconsideration of the Schumpeterian entrepreneur. *Review of Austrian Economics, 11*, 5-17. https://doi.org/10.1023/A:1007719905868

Kirzner, I. (2001). Piyasa süreci teorisi: Tarihsel gelişim [Market process theory: Historical development]. *Journal of Liberal Thought, 21*, 73-85.

Kocabıyık, O. O. (2016). Olgubilim ve gömülü kuram: Bazı özellikler açısından karşılaştırma [Phenomenology and grounded theory: A comparison in terms of some features]. *Trakya Journal of Education, 6*(1), 55-66.

Kritikos, A. S. (2014). Entrepreneurs and their impact on jobs and economic growth. IZA World of Labor, May, 1-10. https://doi.org/10.15185/izawol.8

Kvale, S., & Brinkmann, S. (2009). *InterViews: Learning the Craft of Qualitative Research Interviewing*. Thousand Oaks, CA, US: Sage Pub.

Lechner, C. M., Sortheix, F. M., Obschonka, M. & Salmela-Aro, K. (2018). What drives future business leaders? How work values and gender shape young adults' entrepreneurial and leadership aspirations, *Journal of Vocational Behavior, 107*, 57-70. https://doi.org/10.1016/j.jvb.2018.03.004

Lincoln, Y. S., & Guba, E. G. (1986). But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New Directions for Evaluation, 30*, 73-84. https://doi.org/10.1002/ev.1427

Mallin, M. L., & Serviere-Munoz, L. (2013). An exploratory study of the role of neutralization on ethical intentions among salespeople. *The Marketing Management Journal, 23*(2), 1-20.

Miles, M. B., & Huberman, A. M. (1994). *An Expanded Sourcebook: Qualitative Data Analysis*. Thousand Oaks, CA, US: Sage Publication.

Mises, L. (2012). *Human Action: A Treatise on Economics*. Connecticut, US: Martino Fine Books.

Murray, R. N. (1985). Professor Hébert on Entrepreneurship. *Journal of Libertarian Studies, 7*(2), 281–286.

Nakamoto, S. (2008, October 31). *Bitcoin: A peer-to-peer electronic cash system* [Web Log Post]. Retrieved from www.bitcoin.org: https://bitcoin.org/bitcoin.pdf

New Liberty Standard. (2019, February 1). Bitcoin 2009 exchange rate. *New Liberty Standard*, Retrieved from newlibertystandard.wikifoundry: http://newlibertystandard.wikifoundry.com/page/2009+Exchange+Rate

O'Dwyer, K. J., & Malone, D. (2014). Bitcoin mining and its energy footprint. *25th IET Irish Signals & Systems Conference 2014 and 2014 China-Ireland International Conference on Information and Communications Technologies* (pp. 280-285). Limerick, Ireland: ISSC/CIICT. https://doi.org/10.1049/cp.2014.0699

Olssen, M., & Peters, M. A. (2005). Neoliberalism, higher education, and the knowledge economy: From

the free market to knowledge capitalism. *Journal of Education Policy, 20(3)*, 313-345. https://doi.org/10.1080/02680930500108718

Oylumlu, I. S. (2019). Üçlü Sarmal İşbirliğine Dayalı İnovasyon Model Üretimi: Türkiye Örneği [Based on Triple Helix Innovation Cooperation Model Generation: The Case of Turkey]. Istanbul, Turkey: Hiperlink Yayınları.

Öztürk, M. B., Arslan, H., Kayhan, T., & Uysal, M. (2018). Yeni bir hedge enstrümanı olarak Bitcoin: Bitconomi [Bitcoin as a new hedge instrument tool: Bitconomy]. *Ömer Halisdemir University Academic Review of Economics and Administrative Sciences Journal, 11*(2), 217-232. https://doi.org/10.25287/ohuiibf.415713

Patton, M. Q. (2015). *Qualitative Research & Evaluation Methods: Integrating Theory and Practice*. Thousand Oaks, CA, US: Sage Publication.

Polding, B. (2017). The extension of neutralization theory to business ethics, *Journal of Leadership Studies, 11*(2), 63-65. https://doi.org/10.1002/jls.21528

Sapkota, N. & Grobys, K. (2020), Blockchain consensus protocols, energy consumption, and cryptocurrency prices, *Journal of Energy Markets, 13*(4), 117-139. https://doi.org/10.21314/JEM.2020.221

Shane, S., & Venkatarman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review, 25*, 217-226. https://doi.org/10.2307/259271

Skyes, G. M., & Matza, D. (1957). Techniques of neutralization: A theory of delinquency. *American Sociological Review, 22*(6), 664-670. https://doi.org/10.2307/2089195

Stenberg, R., & Wennekers, S. (2005). Determinants and effects of new business creation using Global Entrepreneurship Monitor data. *Small Business Economics, 24*(3), 193-203. https://doi.org/10.1007/s11187-005-1974-z

Uymaz, A. O. (2020). Spekülatif girişimcilik açısından Emile Zola'nın Para romanının incelenmesi [Investigation of Money novel of Emile Zola in terms of speculative entrepreneurship]. *Alanya Academic Review, 4*(1), 123-142. https://doi.org/10.29023/alanyaakademik.657170

Wachowski, L., & Wachowski, L. (Producer). (1999). Matrix [Movie].

Wales, W., Vishal, G., & Mousa, F. T. (2013). Empirical research on entrepreneurial orientation: An assessment and suggestions for future research. *International Small Business Journal*, *31*(4), 357-383. https://doi.org/10.1177/0266242611418261

Yahoo Finance. (2020, January 1). Bitcoin USD. *Yahoo Finance*. Retrieved from Yahoo Finance: https://finance.yahoo.com/quote/BTC-USD/history/

Yıldırım, A., & Şimsek, H. (2016). Sosyal Bilimlerde Nitel Araştırma Yöntemleri [Qualitative Research Methods in The Social Sciences]. Ankara, Turkey: Seçkin Yayıncılık.

Zhang, T., & Acs, Z. (2019). Does generation matter to entrepreneurship? Four generations of entrepreneurs. *The Southern Economic Journal, 86*(2), 459-477. https://doi.org/10.1002/soej.12350

Appendix 1. Bitcoin Miner Profiles