

# Relationship of Cryptocurrencies with Gambling and Addiction

## *Kripto Paraların Kumar ve Bağımlılık ile İlişkisi*

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### ABSTRACT

Cryptocurrencies has been considered as both an investment tool and a great invention that will replace money and change the world order. Although crypto currency trading has been investigated in many aspects, the psychological dimension that directly affects investors has often been ignored. Control of cryptocurrency trading is in the hands of investors rather than a central authority or institution. Thus, the value of cryptocurrencies changes with the reactions of investors. This situation suggests that psychological factors may be more prominent in cryptocurrency trading. Cryptocurrency trading has many similarities with gambling and betting, such as risk taking, getting quick returns, extreme gains or losses. Some significant components of behavioral addiction are also seen in individuals who spend so much time with cryptocurrency trading. The purpose of this article is to provide a better understanding of the psychological effects of cryptocouurency trading, which has entered our lives over a relatively brief period of time and reached millions of investors.

**Keywords:** Pathological gambling, dependency, addiction medicine, mental health

### ÖZ

Kripto paralar hem bir yatırım aracı hem de paranın yerini alacak ve dünya düzenini değiştirecek büyük bir icat olarak görülmektedir. Pek çok yönüyle araştırılan kripto para ticaretinin, yatırımcıları doğrudan etkileyen psikolojik boyutu genellikle göz ardı edilmiştir. Kripto para ticaretinin kontrolü, merkezi bir otorite ya da kurumdan ziyade yatırımcıların elindedir. Böylece kripto paraların değerleri, yatırımcıların hareketleriyle değişiklik göstermektedir. Bu durum, kripto para ticaretinde psikolojik faktörlerin daha ön planda olabileceğini düşündürmektedir. Risk alma, hızlı sonuç elde etme, tutarsız kazanç ya da kayıp gibi özellikleriyle kripto para ticareti, kumar ve bahis ile birçok benzerliğe sahiptir. Kripto para ticareti ile yoğun şekilde uğraşan bireylerde davranışsal bağımlılığın bazı önemli bileşenleri de görülmektedir. Bu makalenin amacı, hayatımıza kısa sürede girecek milyonlarca yatırımcıya ulaşan kripto para ticaretinin psikolojik yansımalarının daha net biçimde anlaşılmasını sağlamaktır.

**Anahtar sözcükler:** Patolojik kumar oynama, bağımlılık, bağımlılık tıbbı, ruh sağlığı

## Introduction

Addiction is a primary and chronic disease of the neural pathways responsible for modulating reward, motivation and memory (McClure and Mickel 2014, Piper 2015). DSM-5 has brought with it some changes. The "Substance-Related Disorders" section in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) was replaced by "Substance-Related and Addictive Disorders" in DSM-5. Gambling disorder has been included in impulse control disorders in DSM-IV and "Substance-Related Disorders and Addiction Disorders" in DSM-5 (APA 1994, APA 2013). This change is very important in terms of accepting that addiction can occur with gambling as well as drugs or alcohol.

The "behavioral addiction" term first appeared in 1990 and it was defined as extreme desire for a rewarding behavior despite its negative consequences, and difficulty in stopping or controlling the behavior (Marks 1990, Naim-Fell and Zangen 2013). Behavioral addictions affect the neural networks of the brain's reward system like substance abuse (Comings and Blum 2000, Nestler 2005). Neurocognitive deficits like impaired executive functions are seen in both substance abuse and behavioral addictions (Goudriaan et al. 2006).

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From a point of view of psychiatric, new opinions have emerged that some financial activities such as stock market and cryptocurrency trading may also be included in behavioral addictions (Youn et al. 2016, Griffiths 2018). This article lays the foundation for a better understanding of the behavioral factors that affect cryptocurrency trading as well as its relationship to gambling disorder and addiction.

## **Globalization, Cryptocurrency and Mental Health**

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Globalization makes an impact on the change in traditional lifestyle, transformation of ideas, differentiation of cultural values, and destruction of conventional behavior patterns (Gagarina et al. 2019). The economy is one of the domains most affected by globalization. In the globalizing world, the gap between the poor and the rich is getting deeper and the middle class is out of the way (Musterd et al. 2017). It is an inevitable fact that the negative reflections of increased income inequality on mental health (Tibber et al. 2022). The motivation of human beings to protect the value in their hands and to earn by making the right investment can be considered reasonable within certain limits in this difficult period of time.

Cryptocurrency has gained rapid acceptance in the financial world thanks to its innovative perspective and technology integration. It is suggested that blockchain technology can provide a solution to the problem of income inequality in a free market economy (Othman et al. 2020, Chohan 2022). Cryptocurrency trading has grown significantly and accepted by all segments of society in the last few years including the COVID-19 pandemic (Androulakis-Korakakis et al. 2021).

## **Definition of Cryptocurrency**

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Cryptocurrency is digital money whose financial flow is not controlled by a centralized system. Cryptocurrencies are produced by a limited number of computers and can then be transferred (Mills and Nower 2019). Cryptocurrency trading allows people to buy and sell coins or tokens around the clock on particular platforms. The total value of the global cryptocurrency market is over \$ 2 trillion. Bitcoin is the most well-known cryptocurrency in the world and has the highest market cap. The price of some cryptocurrencies like Bitcoin has increased by over 8000% in five years (Coinmarketcap.com 2021). However, there have been thousands of different coins (altcoins) with different market caps (Delfabbro et al. 2021a).

Cryptocurrencies are generally priced by the value that investors place on it. The more interest in a cryptocurrency, the higher its value. It is not possible to make clear scientific inferences about why people buy and sell cryptocurrencies in the light of current information. The most striking factor in this regard is that cryptocurrency trading has similar characteristics to gambling disorder due to sudden price changes in a short period of time (Delfabbro et al. 2021a).

## **Cryptocurrency and Gambling**

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Gambling is the act of wagering or betting money or something of value (valuables or property) on an event with an uncertain outcome with the intent to win more money or things of value (Delfabbro et al. 2020). The number of studies showing that speculative activities like stock trading is a part of gambling disorder has been increasing recently (Grall-Bronnec et al. 2017, Mosenhauer et al. 2021).

Although stock trading is conceptualized as investing for profit, several studies have described stock trading patterns (day trading) and investment choices (margin, options) similar to gambling disorder (Arthur et al. 2015, Youn et al. 2016, Grall-Bronnec et al. 2017). Such activities often involve the prospect of short-term profits with limited information and an emphasis on high risk stocks, rather than considering long-term plans and programs of companies (Kumar 2009, Gao and Lin 2015). In this perspective, cryptocurrency trading is similar to high risk investments, which are often traded and preferred by individuals with a high tolerance for risk (Arthur et al. 2016, Mills and Nower 2019). Indeed, it has been shown that short-term traders are more likely to participate in certain gambling activities (for example, sports betting or poker) than long-time traders. It has been revealed that short-term traders are younger, more educated men and they have more income (Arthur and Delfabbro 2017). It is not surprising that young individuals who are easily adjust to changes, more interested in technology and open to learning show interest in cryptocurrencies (Steinmetz et al. 2021).

Recent studies have suggested existence of some similarities between cryptocurrency trading and the gambling industry (Delfabbro et al. 2021a). These studies have suggested that developments in blockchain technology are intertwined with the gambling industry and cryptocurrency trading may co-exist with gambling disorder (Gainsbury and Blaszczynski 2017, Meng and Fu 2020, Scholten et al. 2020). Spekülatif hisse senetleri veya

kripto para birimleri söz konusu olduğunda, alınan kararlar sınırlı bilgi, yetersiz strateji veya beceriye dayanıyorsa, sonuçların oldukça değişken ve kontrol edilemez olduğu kabul edilir (Delfabbro et al. 2021a). Indeed, it has been reported that some strategies in cryptocurrency trading are also seen in gambling disorder (Senarathne 2021).

A recently published study reveals that individuals with gambling disorders are more interested in cryptocurrency trading (Mills and Nower 2019). Researchers surveyed 876 adults who gambled regularly at least once a month for the year preceding the study and they found that more than 50% of respondents had invested in cryptocurrencies in the past year. They reported that cryptocurrency trading was predicted by a number of factors including sports betting, playing fantasy sports, high-risk stocks investment and gambling disorder. Cryptocurrency trading has been associated with gambling disorder, depression and anxiety (Mills and Nower 2019). It has been shown that getting a high score on the problem gambling index are predictors of increased cryptocurrency trading in another recent study (Delfabbro et al. 2021a). Gambling disorder prevalence is approximately 0.5-2.0% in the general population. It is quite striking that this prevalence is 9.5% for people who trade cryptocurrencies monthly or more frequently (Delfabbro et al. 2021a, Delfabbro and King 2022).

## **Cryptocurrency and Addiction**

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The main factor that makes the crypto money market interesting is that it offers investors the opportunity to make serious profits with price volatility in a short period of time (Delfabbro et al. 2021b). This period of time can sometimes be measured even in minutes and hours. Most of crypto money investors have the thought content that they will maximize profits in a short time through their investments (Pezzani 2018).

Watching the volatility of cryptocurrency can lead a powerful and amazing effect, just like playing slot machines. It has been observed that some of the cryptocurrency investors are heavily preoccupied with price movements, overspending and sacrificing their sleep in order to monitor the market constantly (Mills and Nower 2019, Kim et al. 2020). It has been shown that people who prefer this type of activity have common traits such as impulsivity, fear of missing out, and novelty seeking (Kim et al. 2020). It has been reported that individuals who invest in cryptocurrencies have more self-confidence (less agreeableness, more extroversion) and less self-control (Sudzina et al. 2021).

Salience is one of the most significant components of the addiction model (Griffiths 2005). The fact that the thought content is generally preoccupied with a behavior and its outcomes causes individuals to ignore their other important responsibilities in life. In this perspective, it can be predicted that salience can play a key role in cryptocurrency trading. Developments in the cryptocurrency market and volatility lead to regular monitoring of online media and applications (Dixon et al. 2018). There have been considerable factors that distinguish the cryptocurrency market from all other markets, bet types and games. These are internet access, the facilities to transact any time of the day, anywhere in the world, absence of stigma, anonymity. These factors cause individuals to devote a significant part of their time to crypto money transactions (following, buying, selling), and to disrupt their work, family and social lives.

The need to devote more and more time to trading and/or the need to search for new financial instruments to invest, the desire to trade with increasing amounts of money to catch up with the previous excitement can be explained by the concept of tolerance in addiction. The repetitive unsuccessful attempts to control, restrict or stop trading may present with the relapse dimension of addiction. Loss of interest in previous hobbies and activities, not being able to enjoy other aspects of life, experiencing much stress with loss and trading more to compensate can be interpreted in terms of mood modification in addiction. Loss of interest in previous hobbies and activities, inability to enjoy other aspects of life, feeling of being under too much mental or emotional pressure can be interpreted in terms of mood changes in addiction (Guglielmo et al. 2016).

## **Psychological Factors and Cognitive Biases that Determine Investor Behaviors in Cryptocurrency Trading**

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### **Fear of Missing Out (FOMO)**

One of the strongest psychological factors affecting cryptocurrency trading is FOMO (Przybylski et al. 2013). Social media addiction is the first thing that comes to mind about FOMO (Casale et al. 2018). FOMO is an emotional response to the belief that other people are living better, more satisfying lives or that important opportunities are being missed. Given the strong presence of FOMO in online social networks, it is expected to

exist in crypto trading as well (Delfabbro et al. 2021b). This is related to the fact that cryptocurrency trading emerged in the social media era and took its speculative aspect from the social media culture. This is explained by the reinforcement learning models of social learning (Delfabbro et al. 2021b).

The complex nature of cryptocurrency technology causes most people not to aware of what is going on, too much speculation and information asymmetry. FOMO is generally considered as a way of thinking to be avoided when investing and more common in those who do not have enough knowledge about cryptocurrency trading. Investors are faced with hundreds of cryptocurrencies they have or not in every day. While investors are exposed to references from other investors on social media apps, this may encourage them to buy some cryptocurrencies or wait to earn more. Investors may regret not making more investment if a cryptocurrency they buy skyrocket. If a cryptocurrency that they have not considered buying before rises, they may be disturbed because they missed the opportunity. Thus, cryptocurrency investors feel compelled to be a part of the action as the market rises.

### **Fear, Uncertainty, Doubt (FUD)**

FUD can be defined as the spreading of disinformation to arouse fear, uncertainty and doubt (Pfaffenberger 2000). FUD is based on manipulation and disinformation and it is frequently used in the fields of economy and politics (Cohen and Bar'el 2017). FUD can also be seen in individuals who face with negative news about the cryptocurrency (Civitaresse and Mendes 2018). When negative information is shared about cryptocurrencies, there are usually limited resources and valid information to confirm that information is accurate or inaccurate in the first place. Studies show that negative news has more impact on people and spreads more quickly than positive news (Ito et al. 1998).

### **Herding Behavior**

Herding behavior is a common decision process in individuals who prefer to follow others or imitate group behavior rather than making decisions on their own (Baddeley 2010). It has been proven that the most common cognitive bias in the capital and financial markets in both developed and developing countries is herding behavior (Spyrou 2013, Kumar and Goyal 2015). This behavior indicates that investors tend to trust information from other investors rather than personal ideas and company expectations. There have been studies showing the existence of herding behavior in the cryptocurrency market (Ajaz and Kumar 2018, Bouri et al. 2019, Vidal-Tomás et al. 2019). The majority of people in the cryptocurrency market are inexperienced investors. Inexperienced investors often seek short-term gains and often lose money as a result of their limited knowledge decisions (Delfabbro et al. 2021a).

### **Loss Aversion**

Value-based decisions are ubiquitous in everyday life. These can be short-term and usual like choosing a meal or drink at a restaurant, or long-term and life-changing like choosing a major in university. The value, delay, and probability of rewards and losses are filtered in the mind to calculate the subjective values of the available options in all these decisions (Rangel et al. 2008). Pathological gambling and alcohol addiction are classified as addictive disorders in the DSM-5 as they show similar neurobehavioral patterns and clinical features (eg, craving, tolerance, loss of control) in value-based decision making (Bechara 2005, Leeman and Potenza 2012, Clark 2014). Accordingly, loss aversion, which is a profitability/loss parameter in value-based decision making, is seen in both pathological gambling and alcohol addiction (Genauck et al. 2017).

Loss aversion is a bias that can be explained by prospect theory. Prospect theory is used to explain how people make decisions between different options or expectations, especially under conditions of uncertainty (Kahneman and Tversky 1979). Humans tend to prefer loss aversion over gaining equivalent profit. This is because losing something of equal value creates a much stronger emotional impact than gaining it (Ising 2007). Individuals tend to focus more on how much they lose rather than how much they gain, and to avoid risk as much as possible. Loss aversion behavior can push investors to seek safe haven during turbulent times (Baur and Lucey 2010). In such cases, gold, strong currencies, long-term treasury bills and finally cryptocurrencies attract more attention of investors in the short and medium term (Conlon et al. 2020).

### **Anchoring Bias**

Human beings tend to believe that the first information they hear about a subject is usually correct, and to rely heavily on this information when making decisions. All subsequent evaluations and decisions are basically shaped by this initial knowledge or thought (Tversky and Kahneman 1974). The anchoring bias is a situation

that many physicians encounter in daily medical practice frequently and not aware of (Rehana and Najia 2021). Believing that a decision based on initial preliminary diagnosis or examination findings is correct is a good example of anchoring bias.

Another common example of the anchoring bias, which is frequently observed in decisions, shopping and investments, is ordinary and unprofessional cryptocurrency investors who are overconfident in their knowledge of the markets. Many investors have a bias that continues to remember the purchase price of the shares in their portfolio. The selling decision is usually based on the purchase price, which is the reference point. When the price rises above the reference point, investors may decide to sell their shares sooner. In addition to the purchase price, the highest share price in a certain period can often become the reference price (Kartini and Nahda 2021).

### **Optimism Bias**

Individuals with gambling disorders are thought to be unable to limit their gambling frequency and have faulty cognitions about probabilities. Regardless of the objective probability of winning a high-risk bet, it has been argued that gamblers perceive the probability to be greater than it actually is, and their behavior is directed towards it (Gibson and Sanbonmatsu 2004). This has been defined as an 'optimism bias', which suggests individuals with gambling disorders to think have a greater chance of winning than estimated odds. The optimism bias is a belief that people will be less likely to experience a negative event and more likely to experience a positive event (Kartini and Nahda 2021).

There have been many studies suggesting that there is a direct relationship between optimism bias and investment decisions (Bracha and Brown 2012, Kinari 2016). The optimism bias in cryptocurrency trading appears after observing many people to start buying cryptocurrencies. The idea that there can be profits from some cryptocurrencies will affect the optimism bias.

### **Confirmation Bias**

When people come across various information that is contrary to their ideas or beliefs, they tend to ignore or remain indifferent to the information in question. On the other hand, they tend to look for information that supports their ideas or views, and tend to attach much importance to this information. Confirmation bias can be evaluated as a tendency to seek information that supports one's own view (Ising and Pompian 2006). Confirmation bias is a cognitive process that affects individuals' interpretation of information to fit their own views or beliefs.

Confirmation bias is more common especially among people who bet. Gamblers often feel that their methodology or thought process is "approved" towards a positive trend or outcome. It is difficult to change the way gamblers think and steer them in a different direction, because most of them are making their own way, unable to get out of the stereotypical and preconceived field of view (Gibson et al. 1997).

It is possible to see traces of confirmation bias in people who trade cryptocurrencies. It is known that the price movements of cryptocurrencies are affected by new information (Ciaian et al. 2016). Technical analysis is the only approach used to predict the price of cryptocurrencies. The fact that people who invest in cryptocurrencies ignore the news, signals, and technical analysis explains confirmation bias.

### **Conclusion**

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Although cryptocurrency trading is new, it has managed to change the dynamics of the financial world. While cryptocurrencies are seen as the currency of the future, they have even started to be used instead of money in various parts of the world. Cryptocurrencies have attracted the attention of people in a short time and the number of investors have increased every day. While studies of behavioral and psychological factors underlying financial decisions are generally limited, research on cryptocurrencies is still in its infancy.

Recent studies suggest that cryptocurrency trading may be associated with sports betting, high-risk stocks and gambling disorder. Mills and Nower (2019) reported that more than half of those with gambling disorders had invested in cryptocurrencies in the previous year and that cryptocurrency trading may cause some mental problems. Salience, mood modification, tolerance, withdrawal and relapse components of behavioral addiction can be easily observed in individuals who are heavily involved in cryptocurrency trading. Although cryptocurrency trading cannot be directly associated with pathological conditions such as addiction and gambling, the fact that these concepts may be related to each other should not be ignored in the light of current

information. In this context, it is a fact that there is a need for studies that will help reveal the relationships between cryptocurrency, addiction and gambling disorder.

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