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COURSE
11455B

Fraud and Manipulation in Cryptocurrency Markets

Cryptocurrency markets operate differently from traditional financial markets—and so does the fraud that occurs within them. This course dives into the unique manipulation tactics used in crypto environments, from pump-and-dump schemes to wash trading and beyond. As digital assets become more mainstream, CPAs and tax professionals increasingly encounter clients with crypto holdings or transactions. Understanding how fraud operates in these markets helps you provide better guidance, spot red flags, and navigate the evolving regulatory landscape surrounding digital assets.

CREDIT HOURS 2 | FIELD OF STUDY AUDITING | EXAM QUESTIONS 10

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Assignment

- Study the full course materials included here.
- Complete the review questions after each chapter.
- Answer 10 final exam questions.
- Final exam is scored immediately, 70% or better passes.
- Certificate of completion is available in your account.
- Failed exams can be retaken free of charge.

Course Objectives

- Identify the characteristics of cryptocurrencies.

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Chapter 1: FRAUD AND MANIPULATION WITHIN CRYPTOCURRENCY MARKETS

Chapter Objective

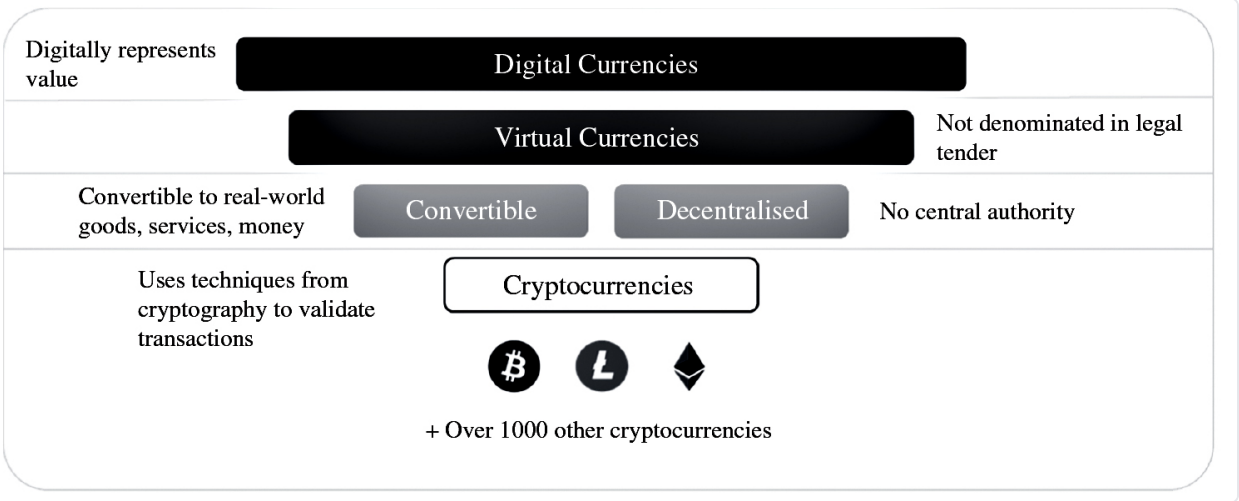
After completing this chapter, you should be able to:

- Identify the characteristics of cryptocurrencies.

8.1 INTRODUCTION

Digital currencies are electronic representations of value that include a broad range of common payment systems, such as gift cards, air miles, and mobile coupons. **Virtual currencies** are a subset of digital currencies which, rather than being denominated in fiat currency, (government backed currency, e.g., USD, GBP), use their own unit of account. Examples include those within online games or Internet-based currencies. **Cryptocurrencies** are a type of virtual currency (and therefore a digital currency) but rely on techniques from cryptography for security, **which allow them to function without a centralized authority, such as a central** bank, government, or private company.[1] (See Figure 8.1.) The rise of cryptocurrencies was led by the introduction of bitcoin in 2008, which was one of the first to use a decentralized public ledger, known as a blockchain, to record transactions without the use of a trusted central authority.

FIGURE 8.1 CRYPTOCURRENCIES AS A SUBSET OF A BROADER CATEGORY OF DIGITAL CURRENCIES.

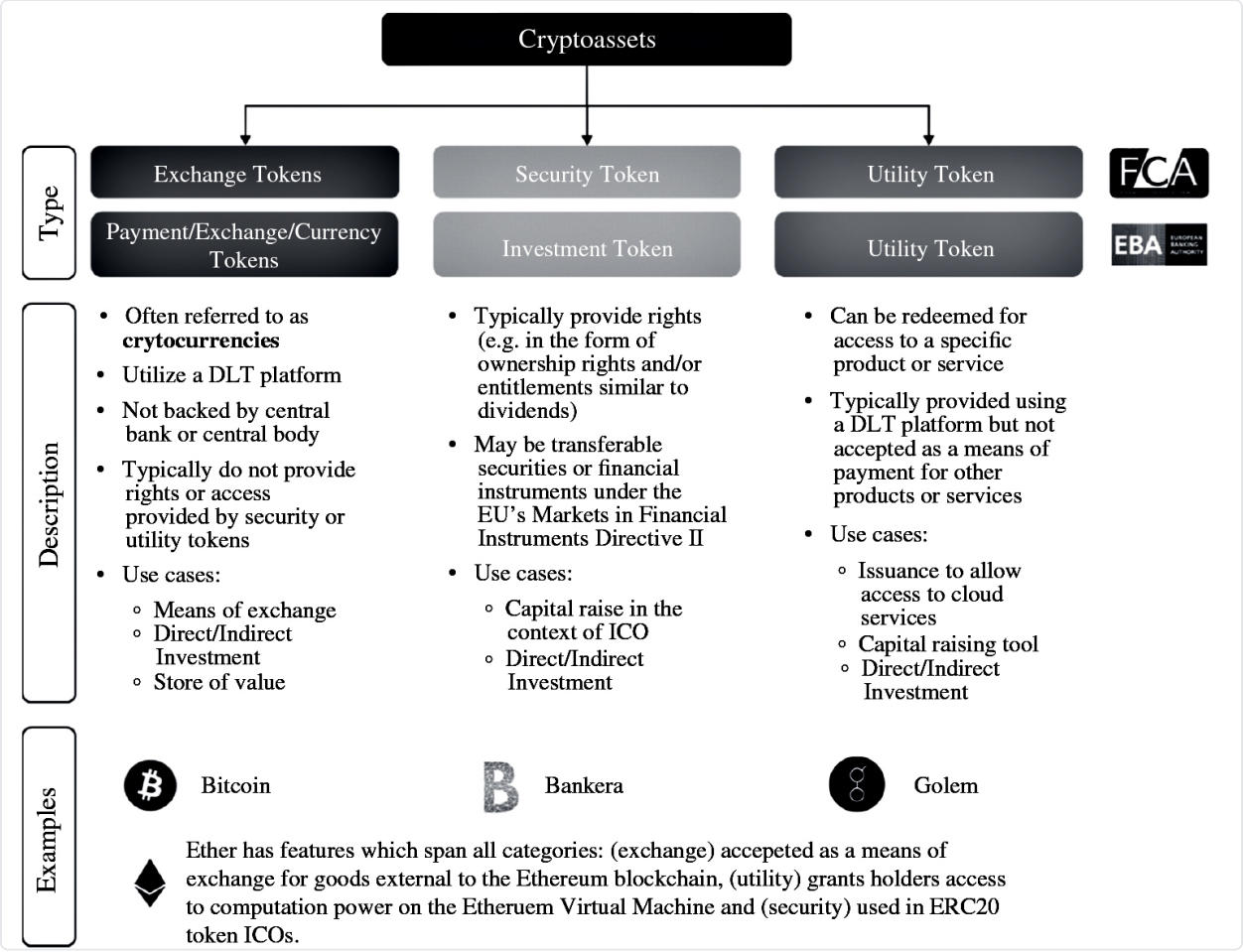


In general, in this chapter, each financial instrument we discuss we refer to as a cryptocurrency. A cryptocurrency is in fact quite a narrow, albeit recognizable, description of a subset of an umbrella class of cryptoassets, a nomenclature appearing increasingly in regulatory frameworks. There is no single agreed definition of a cryptoasset, but in general they are cryptographically secured digital representations of value or contractual rights which can be stored, transferred or traded electronically. They are powered by a form of **Distributed Ledger Technology** (DLT). The different types of DLT are beyond the scope of this chapter, but DLT can be thought of as an umbrella of technological solutions which facilitate the distribution of records or information (the kind you might find on accounting ledgers), among all those who use it, either privately or publicly.[2]

The Bitcoin blockchain was the first fully functional DLT, used and maintained by a network of communicating nodes which run the client software.[3] Over time, many other projects have emerged. The level of innovation in these projects varies greatly: some are near clones of bitcoin or other cryptoassets and simply feature different parameter values (e.g., transaction speed, currency supply, and issuance scheme); however, some have emerged which, while sharing some familiar concepts, provide novel and innovative features that represent substantial differences.

Producing a universal taxonomy of all these new and emerging cryptoassets has proven difficult. However, recent published reports by the Financial Conduct Authority (FCA) and European Banking Association (EBA) settle on a similar framework, splitting cryptoassets into three categories as shown in Figure 8.2. The way a cryptoasset is used, or its features, mean it could fall under more than one category. For example, although bitcoin was initially intended as a means of exchange (exchange token), most current users of bitcoin hold it for investment purposes (security token).

FIGURE 8.2 TAXONOMY OF CRYPTOASSETS AS DESCRIBED BY FCA AND EBA REPORTS PUBLISHED IN OCT 2018 AND JAN 2019, RESPECTIVELY.[45]



This framework also identifies the three main use cases of cryptoassets:

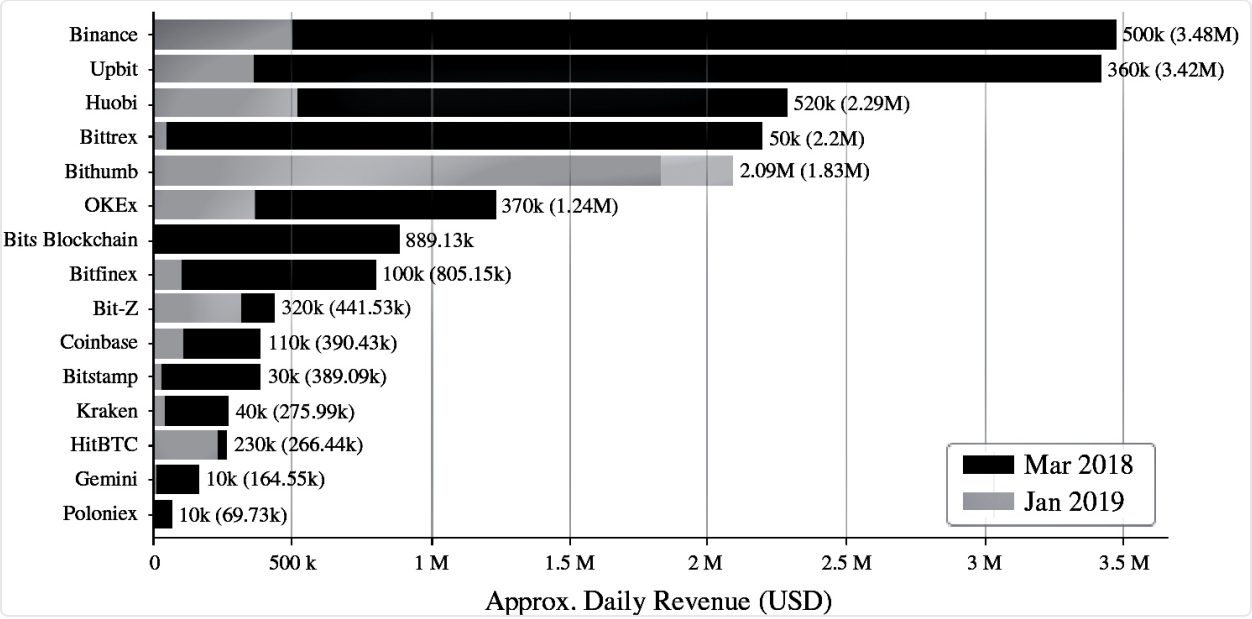
1. As a means of exchange to enable the buying or selling of goods and services, or to facilitate regulated payment services.
2. For investment, by gaining direct exposure by holding and trading cryptoassets, or indirect exposure by holding and trading financial instruments which reference cryptoassets.
3. To support capital raising and/or the creation of decentralized networks through Initial **Coin Offerings** (ICOs).

ICOs, (or token sales), involve raising funds from the public by issuing project-specific exchange, security or utility tokens in exchange for an existing cryptoasset or fiat currency. They can be viewed as an alternative to traditional capital raising instruments and individuals and firms typically buy ICO tokens as an investment, to secure access to a specific service, or to gain other rights attached to a token. While ICOs are beyond the scope of this chapter, they present their own regulatory challenges: recent research identified that in 2017, 78% of ICO-initiated projects that achieved market capitalization over $50 million were scams.[6]

Crypto tokens are typically obtained via one of three methods: (1) participating in the transaction validation process (e.g., "mining"), which yields crypto as a reward for expending resources; (2) receiving directly from another crypto holder; (3) investing directly in an ICO; or (4), purchasing through a crypto exchange.

Crypto exchanges form a fundamental part of the ecosystem as they offer a secondary market in which crypto can be bought or sold in exchange for either fiat currency or other crypto tokens. They are also the main target of a lot of the manipulations we examine, since they provide financial markets (which can be manipulated), and often become single stores of immense value (which can be hacked and stolen from). As shown in Figure 8.3, it is typical to see millions of dollars' worth of crypto traded every 24 hours; this volume is required to be stored in exchange accounts. For example, Bittrex, a US-based crypto exchange holds $233.5 million worth of crypto tokens in one Ethereum wallet address.[7]

FIGURE 8.3 COMPARATIVE 2018 VS. 2019 DAILY CRYPTO EXCHANGE REVENUE ESTIMATED WITH COINMARKETCAP REPORTED 24HR VOLUME AND FEES LISTED ON EACH EXCHANGE'S WEBSITE. ALTHOUGH TRADE VOLUME HAS DROPPED CONSIDERABLY IN 2019, TOP EXCHANGES STILL MAINTAIN GOOD REVENUES.



The market price and traded volume of the 2000+ crypto tokens currently listed on exchanges combine to form an asset class with a market capitalization (market price multiplied by the number of existing currency units) of $121bn.[8] While still relatively small compared to traditional asset classes, the growth of the crypto market in recent years has drawn the attention of traders and investors who look to profit from buying and selling units of cryptocurrency. Many traditional

financial institutions, predominantly hedge funds, are reported to be moving into the area; partly attracted by the high volatility of prices (Chan, et al., 2017), and recent price rises.[9]

The first major exchange, Mt. Gox, originally designed in 2007 as an exchange for fantasy trading cards, was launched in 2010 allowing users to trade bitcoins and grew to handle most global bitcoin trading.[10] Due to several technical issues throughout its existence, (as detailed later in Section 8.6), bitcoins were being removed over a prolonged period by an unknown entity. The loss of bitcoins caused Mt. Gox to collapse in 2013 and then file for bankruptcy in 2014. Despite Mt. Gox's failure, replacements quickly emerged and running a crypto exchange proved a lucrative business: the top 10 exchanges in 2017 we estimated to be generating as much as $3 million in fees per day during 2017. Today there are over 200 exchanges operating globally, with $19bn transacted over a typical 24hr period.[11]

One of the most important, often missed, factors of exchange trading is that a significant portion of trading occurs separately from the blockchain. Although normal cryptocurrency transactions are blockchain-based, i.e., if you were to send a friend some bitcoin from your wallet to theirs, you would be able to view this transaction on the public blockchain once completed with a provided transaction hash. However, trades on an exchange platform are done simply by updating a user's account balance within the service's database. As such, when an exchange trade is completed, you are not actually sending crypto to another person, (or vice versa), you are relying on the exchange to reflect this update within their internal records. The primary reason for this, in general, is that blockchains are too slow to handle the frequency and volume of exchange trades.

To be able to trade, users must have funds in their exchange account. To fund an account with crypto, a user transfers their crypto into the exchange's designated blockchain wallet, and the quantity received by the exchange is credited to the individual user's trading account in their internal system. The wallet addresses that an exchange gives you to deposit into are not your addresses. The exchange is holding your crypto for you, and they can do whatever they want with it: you do not technically have complete ownership of the crypto until you choose to withdraw it. On some exchanges, known as "banked exchanges," fiat currency can be used as funding via a transfer to the exchange's bank account. Exchanges that do not accept fiat currency deposits and withdrawals are referred to as unbanked, since they do not (usually) possess a traditional banking license to facilitate this process. Whether crypto or fiat, once a deposit is completed, the user is then able to trade with other users of that exchange.

Withdrawals of cryptocurrencies or fiat are done in a similar way to how they are deposited. When you withdraw crypto, you are not sent crypto from "your" addresses either, but rather from other addresses in the exchange's wallet and, often, your withdrawal will be part of the same transaction as other people's withdrawals.

Almost all crypto exchanges use a limit order book to facilitate trading. A limit order book represents the list of orders that an exchange uses to record the interest of buyers and sellers of a crypto-to-crypto or crypto-to-fiat instrument. At each price level, the number of shares being offered and demanded is recorded.

The two most basic types of order on a typical exchange are "limit" and "market" orders. **Limit orders** are those which indicate a price and quantity at which a trader is willing to buy (bid) or sell (ask) an asset (in this context, a particular crypto), and these are recorded in the order book. Traders who hold inventory and simultaneously post limit orders to both buy and sell are referred to as market makers. Market makers are important in providing liquidity and are compensated for the risk of holding assets through the spread (difference between bid and ask orders they post).

A market order does not specify a price, but a quantity and direction (buy or sell). Market orders are matched with limit orders from the opposite side of the order book. For example, a market order to buy one bitcoin would be filled from limit sell orders, starting from the lowest price level, (known as the "best ask"). If the quantity of the market order is greater than that of the before combined volume of limit sell orders at that price level, the order is partially filled at that price level and the next best price is used to fill the remaining quantity. The matching process continues until the entire order has been filled. Figure 8.4 gives a visual representation of an order book (on the left-hand side) with price on the x-axis and buy/ sell limit order cumulative volume on the y-axis. The most recently filled orders are shown under "trade history" (on the right-hand side) and list the price and quantity at which trades have been executed.

FIGURE 8.4 EXAMPLE LIMIT ORDER BOOK AS SEEN ON ONE CRYPTOCURRENCY EXCHANGE.



Other types of order include stop orders that specify a "stop price," which if hit, triggers the placement of a pre-specified limit or market order. Stop orders can help traders protect profits, limit losses or initiate new positions but (as seen in Section 8.5) may unknowingly magnify the effect of market manipulation.

Most cryptocurrencies are cross-listed assets, i.e., traded on multiple exchanges. This results in a global price determined by multiple exchanges simultaneously, leading to inter-exchange dynamics and price discovery implications (Brandvold, et al., 2015). Each exchange will have its own price for a cryptocurrency, which may vary depending on factors such as local demand, exchange reputability and trading fee structure. If prices between two exchanges diverge enough, variants of exchange arbitrage (buying on the cheaper exchange, and selling on the more expensive exchange) tailored specifically to cryptocurrency markets, will be likely to cause the prices to converge, where possible. Due to this fragmented global nature of the market, manipulation occurring on one exchange in one region of the world may affect the price of a cryptocurrency on other exchanges around the world.

The purpose of this chapter is to provide an overview of the many alleged manipulations occurring within crypto trading markets. Firstly, in Section 8.2 we attempt to document and explain the reasons why the cryptocurrency markets are an attractive target for manipulation. Next, we discuss each manipulation in detail: Section 8.3 introduces "pump and dumps" where influential entities target and manipulate the price of certain cryptos; in 8.4 we discuss the alleged historic inflation of trading volume by certain exchanges; 8.5 examines the combination of a DDoS attack with specific trading patterns to achieve profits by manipulating exchange market activity; 8.6 and 8.7 review hacks and flash crashes within crypto; 8.8 examines two order book-based manipulations known as quote stuffing and quote spoofing, which are designed to mislead or slow other traders; and 8.9 introduces the concept of a stablecoin and looks at the history and ongoing controversy of Tether, the largest stablecoin.[12] Finally, 8.10 discusses the latest trends and how they might affect the propensity for fraud and regulation.

8.2 WHY DO FRAUD AND MANIPULATION OCCUR IN CRYPTOCURRENCY MARKETS?

Almost every fraud or manipulation we discuss in this chapter is derived from approaches seen elsewhere, often in traditional financial markets, which, while used historically without sanctions, would today be quickly reprimanded, given tighter modern regulation and accountability. In cryptocurrencies, however, their use remains prominent to this day (with the exception of inflated trading volume, which was stopped in early 2017). The occurrence of each manipulation covered in this chapter is linked to one or more of the reasons below.

8.2.1 Lack of Consistent Regulation

Many regulators around the globe have been cautious about imposing potentially restrictive regulation on the areas of cryptocurrencies, cryptocurrency trading, and related blockchain technology. Even for those seeking to be proactive, correct regulation has posed considerable challenges, as summarized in Pieters and Vivanco, 2017. Simply providing a coherent definition of *what* a cryptocurrency is (and thus an appropriate regulatory framework) has proved challenging, with different jurisdictions providing varying classifications – including as a currency, commodity,