

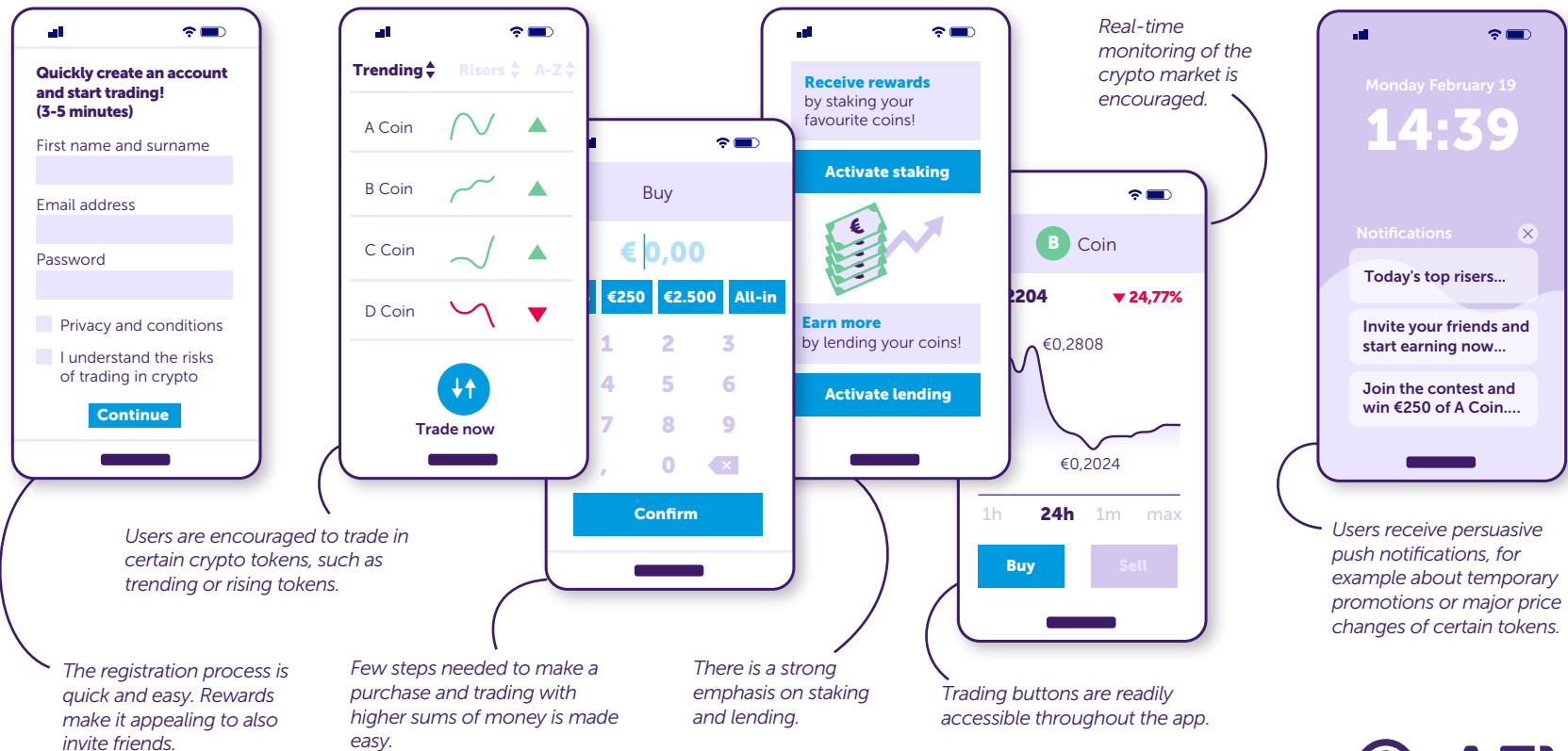
Risks in the choice environment of crypto apps

In brief The Markets in Crypto-Assets Regulation (MiCAR) enters into force at the end of 2024. In preparation of this, the AFM is exploring potential risks in the crypto market. This exploratory study into the choice environment of crypto apps shows, among other things, that steering and activating elements in these apps put users at risk of trading more frequently and trading in products that are not in their best interest. Given that MiCAR does not offer the AFM tools to directly address these risks, we advise consumers to stay vigilant: crypto-assets remain high-risk products. The AFM will spark the discussion with European policy makers about the importance of carefully designed choice environments in crypto apps.

Risk 1 Crypto market is easily accessible to a broad audience. Examples:

Risk 2 Users are steered when using the app. Examples:

Risk 3 Users are activated to return to the app and take action. Examples:



Summary

The Markets in Crypto-Assets Regulation (MiCAR) will ensure that crypto-asset services – such as crypto applications (apps) – are regulated more strictly. After MiCAR goes into force on 30 December 2024, crypto-asset service providers that are active on the European market must ensure, amongst other things, that the information that they provide to consumers is fair and that they do not advertise in a misleading way. The AFM intends to act as a critical supervisor. MiCAR aims to improve the protection of consumers, but not all risks will be eliminated by the new regulations.

The AFM is conducting research to identify consumer risks that will remain after MiCAR comes into effect. At the end of 2023, an exploratory study of the online choice environment of the apps of three Dutch crypto-asset service providers was carried out. The design of the choice environment influences how people consider their options and what choices they ultimately make. MiCAR will not impose requirements on the design of the choice environment of crypto apps. This study assessed the presence of elements in crypto apps that could influence user choices and potentially pose risks. The three main risks identified relate to the following:

1. The crypto market is easily accessible to a broad audience.

The crypto apps examined are all highly accessible due to an easy registration process. By offering referral rewards, the apps encourage current users to invite friends. These invites likely have a strong influence on the decision of friends to start trading in crypto as well – partly driven by a *Fear of Missing Out*. The easy access and the offering of referral rewards both entail the risk that consumers for whom crypto is not a suitable product will also enter the crypto market. This could include consumers who cannot afford to lose the money they trade with, who are not well informed about the risks of crypto, or for whom the risk of crypto does not match their risk preferences.

2. Users are steered towards trading (with high amounts) in certain crypto tokens and activating additional services.

In all apps examined, users are directed towards trading in general and towards trading in certain crypto tokens, amongst others by highlighting trending tokens and news items. A purchase or sale is completed within three to four clicks and there are few barriers that enforce users to reflect on the choices they make. This entails the risk that users make impulsive choices and spend (more) money on crypto tokens that they might not have chosen otherwise. All of the apps studied highlight the services of staking and lending, with no attention paid to what these services are and the risks involved. The ease with which these services can be enabled poses the risk that users will stake or lend crypto tokens without being fully aware that they are doing so or what this entails exactly.

3. Users are encouraged to return to the app and to take action.

Both within and outside the apps, users are stimulated to reopen the app and keep taking action. By focusing on short-term returns and showing prices that switch real-time, users are encouraged to closely follow the crypto market. Push notifications encourage users to return to the app and often steer them towards taking certain actions, such as trading in rapidly rising or newly added crypto tokens. In addition, temporary promotions encourage users to act quickly. These elements all entail the risk that users become highly engaged with the app, trade more frequently and trade in crypto tokens that they may not have chosen themselves.

MiCAR does not include provisions regarding the design of the online choice environment of crypto apps. Consumers active in the crypto market should therefore remain vigilant themselves. Crypto are high-risk products that seem to be suitable for only a very small group, and this will remain the case under MiCAR. It is critical that consumers trade only with money that they have and that they can spare. Moreover, consumers should make informed choices by educating

themselves about the nature of the products they purchase, including the associated risks. The AFM will initiate discussions with European policymakers to raise awareness of the importance of well-designed choice environments of crypto apps.

1. Background

1.1 What is crypto?

Crypto-assets¹ are a digital representation of value or rights that can be traded and stored through a distributed ledger. What distinguishes crypto from traditional currencies is that they are decentralised. This means that they are not controlled by central authorities such as central and commercial banks. Instead, transactions are verified and recorded on a distributed ledger known as the blockchain, a technology that is also called Distributed Ledger Technology (DLT). Besides serving as a form of digital money and value storage, crypto is also used for various other purposes, such as enabling other decentralised services, whether financial or not.

Crypto comes in several forms and differs in the underlying technology used, each with their own characteristics, risks and value. The value given to crypto is mainly based on the extent to which crypto is being used and its potential technological usefulness. The speculative nature associated with crypto results in prices that can fluctuate widely. In addition, the pseudonymity of crypto issuers and owners and the possibility of international trade without intermediaries makes it difficult to assess the integrity of crypto and crypto services by consumers and supervisors.

Risks with respect to crypto affect the integrity and stable operation of crypto markets on the one hand and consumer protection on the other. The integrity of crypto markets is a significant risk for crypto. This includes the absence of rules for asset separation, the risk of market abuse (insider trading, market manipulation) and the risk of money laundering and terrorist financing and evasion of sanctions legislation. Crypto markets also entail a potential risk to financial stability as their size and interconnectedness with the traditional financial system increases. In addition, there are significant risks for consumers, as crypto are high risk products that only seem suitable

for a very small group. These risks can be amplified by offering crypto to consumers in an accessible manner and offering crypto through unclear, incomplete and misleading information.

Crypto and underlying techniques can bring innovation to financial markets. The possible benefits mainly concern the underlying blockchain technology. Due to the decentralised, global nature of blockchain technology, crypto is not dependent on individual platform providers or traditional financial intermediaries. This allows for low transaction fees and almost instantaneous settlement of transactions. However, the degree of innovation and possible benefits varies per crypto.

1.2 What is the legal framework?

Currently, crypto and crypto services are generally not subject to supervision by the AFM. However, financial products or financial services based on crypto may fall under our supervision. Examples include: managing a collective investment company that invests in crypto, issuing a share or bond using blockchain technology and issuing crypto-based derivatives. Providers of crypto services wishing to operate in or from the Netherlands must apply for registration in the public register of De Nederlandsche Bank (DNB). To do so, they must be able to demonstrate compliance with legislation related to the prevention of money laundering and terrorist financing and the Sanctions Act (*Sanctiewet*). However, consumers are currently not protected as with other financial products or services.

As from the end of 2024, crypto services – such as crypto apps – will be more strictly regulated by the Markets in Crypto-Assets Regulation (MiCAR), but it is not a solution to all risks in the crypto market. MiCAR was published in June 2023 and will enter into force in phases as from mid-2024. MiCAR aims to support innovation and fair competition

1 Throughout the remainder of this report, we refer to crypto-assets when the term crypto is used. When referring to specific crypto-assets, the term crypto tokens is used.

while ensuring better protection of individual holders and integrity in the crypto markets. MiCAR does not address all risks surrounding crypto to the same extent. For example, unlike the Markets in Financial Instruments Directive II (MiFID II),² MiCAR does not impose any requirements in the field of product development and distribution. This also applies to the design of the choice environment in crypto apps. With regard to market abuse, MiCAR also does not go as far as existing legislation and regulations in this area. In addition, the supervision of crypto-asset service providers (CASPs)³ is limited by the fact that this is mainly organised at a national level, while crypto markets are pre-eminently cross-border in nature. Crypto service providers licensed in another European country may also serve Dutch consumers, for example through apps. For the supervision of these parties, the AFM will be largely dependent on the foreign supervisor where the crypto service provider is licensed.

1.3 What risks for consumers will remain?

The AFM is currently preparing for the entry into force of MiCAR and the supervision of crypto markets and crypto service providers. The AFM takes a risk-based approach in its supervision. This means that when granting licences to crypto parties, the AFM will focus on the significant risks with respect to the organisation of the business operations and management. In its ongoing supervision, the AFM will focus on the most important risks with regard to business operations, integrity, transparency and service provision. This means that crypto service providers must meet various requirements such as asset separation, preventing money laundering and conflicts of interest, as well as providing consumers with fair, clear and not misleading information.

As mentioned, some risks remain unaddressed under MiCAR. AFM's risk-based crypto supervision will therefore also focus on identifying

what risks remain for consumers after MiCAR takes effect. In this context, the AFM has conducted various studies to gain insight into, amongst other things, the characteristics of current crypto owners and the environment in which they trade. Survey research on a representative panel in April 2023 found that 11% of respondents owned crypto at that time or before. This amounts to about 1.95 million Dutch crypto owners (current and former). Of these crypto owners, 4% indicated they had previously owned crypto but no longer owned it at that time. Crypto ownership is more common amongst men, younger age groups and middle and higher educated people (for figures, see Appendix 1. Characteristics of crypto owners).⁴

To get a better understanding of the environment in which crypto owners make decisions, an exploratory study was conducted into the choice environment of applications that service providers use to offer crypto (crypto apps). The design of the choice environment influences how people consider their options and what choices they ultimately make.⁵ This design can have both a positive and negative impact on the choices people make; from encouraging sensible financial behaviour to inciting purchases that are not in the consumer's best interest. It is impossible to design a 'neutral' choice environment, since a decision will always have to be made regarding the way in which options are presented. However, crypto service providers can design the choice environment in such a way that it prioritizes commercial interests over customer interest.

In this context, an exploratory study into the choice environment of crypto apps of three Dutch and one foreign crypto service provider was conducted at the end of 2023. The rest of this report focuses on the results of this study. Section 2 discusses the main findings. On the basis thereof, Section 3 draws a conclusion regarding potential risks for consumers in the crypto market.

² MIFID II applies to investment firms and trading platforms. These regulations aim to make European financial markets more efficient and transparent and increase investor protection.

³ Called 'service providers' or 'crypto service providers' in the remainder of this report.

⁴ In April 2023, a survey research was conducted on various financial topics amongst 1,163 Dutch consumers who are part of the LISS panel. The LISS panel is managed by Centerdata, an independent research institute. The panel has been selected in such a way that it is representative of the Dutch population. When extrapolating the data to the number of Dutch users, it must be taken into account that results are based on survey research and that this number is therefore surrounded by uncertainty.

⁵ See, for instance, [Understanding, Guiding, Measuring](#) (AFM, 2021); [Johnson et al. \(2012\)](#); [Münscher et al. \(2015\)](#); [Sunstein \(2014\)](#); [Szasz et al. \(2018\)](#); [Thaler et al. \(2013\)](#)

2. Steering and activation in crypto apps

At the end of 2023, the AFM conducted an exploratory study into the online choice environment of the apps of three Dutch crypto service providers. These service providers collectively serve the majority of Dutch crypto owners. The purpose of this exploratory study was to identify potential risks for consumers by making a first assessment of the presence of guiding elements in crypto apps that influence choices. Where possible, observations have been enriched with results from previous studies and insights from academic literature in order to better estimate the possible ways in which consumer choices are influenced. However, based on this study, we cannot determine the actual effect of the choice environment on the behaviour of app users.

For this study, accounts were opened with three Dutch crypto service providers. In addition to the app, the registration process was also examined. The website and other communications, for example via email, were not taken into account. The conclusions in this report are based on observations during a short time period in November and December 2023. It is therefore possible that changes have taken place in these apps in the meantime. The app of one foreign service provider was also examined. Since only one foreign service provider was involved, these observations are described separately from the other three crypto apps. The results can be found on page 17 of this report in the 'Foreign crypto service provider crypto app observations' box. More information about the research design can be read in Appendix 2 'Research methods'.

This section describes the observations and the associated risks for consumers using crypto apps. These are organised into three subsections based on the different interaction's users have with crypto apps: access to the app, use of the app and returning to the app.

2.1 Easy access to the app

Over the past few years, crypto trading has increased substantially.⁶ This increase is partly caused by the easy access to the crypto market that crypto apps offer consumers. This easy access entails the risk that consumers for whom crypto is not a suitable product will also enter the crypto market. This applies, for instance, to consumers who cannot afford to lose the money they use to trade or to consumers who do not understand the market or the risks.

This subsection explains the observations related to access to the crypto apps.

2.1.1 The registration process is easy to complete

Prior to and during the registration process, consumers are exposed to various advertisements that highlight the benefits of crypto, trading in crypto and the specific service provider. For example, all three service providers emphasise that they comply with European laws and regulations and/or that they have a DNB-registration, that they offer a wide range of tokens and that an account can be created quickly. The possibility of generating passive income by putting crypto 'to work' is also mentioned by one service provider. In addition, various visualisations of piles of money and green rising lines are shown by two of the service providers.

The registration process is quick and easy.

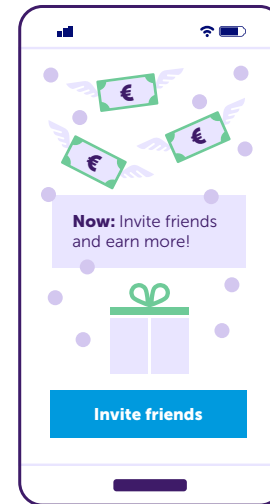
⁶ Auer et al. (2023); Weber et al. (2023)

Creating an account is an easy process and takes about 3 to 10 minutes. Consumers must share their name, email, funding source and reason for opening an account with all three service providers. Other information requested – not covered by all observed service providers – includes address, telephone number, employment status and net income. Two service providers include identity verification as part of the standard registration process, requiring users to upload a photo of an identity document and a selfie video or photo. With the other service provider, ID verification follows later and is only required if one wishes to deposit more than 250 euros or crypto. As a result, the registration process with this service provider is significantly shorter. One of the service providers personalises the registration process by interactively responding to the data entered by users.

Most consumers will be able to complete the registration process with ease. This ensures that the crypto market is easily and quickly accessible to a wide audience.⁷ Possible doubts that consumers have can be dispelled by the advertisements shown during the registration process. The convenience of the whole process and the presence of an identity check could also create a sense of security and trust and hence decrease any doubts.⁸

During the registration process of two service providers, the risks of crypto are briefly discussed. Consumers are asked to check a box certifying that they understand the risks involved in trading crypto and/or that there is a risk of losing all or part of their invested money. It is good that users are forced to reflect on the risks of crypto during the registration process. However, it is unlikely that this has much impact, as most users will only check the box to proceed in the process and because the risks are not, or not clearly, defined at this point.

Two service providers require by default that an access code be set when logging in for the first time via a mobile phone. The other service provider's default setting is that the app can be opened without any access code. All studied service providers allow users to activate two-factor authentication themselves. Even though it is only possible to transfer money to accounts registered on the users' name, it would be better that all apps are not freely accessible, for example in case of theft of the phone. Setting an access code by default seems desirable, as users often leave default settings unchanged and do not alter them on their own initiative.⁹



Rewards make it appealing for users to invite friends to join as well.

2.1.2 Referring friends is rewarded

All three service providers offer the opportunity to invite friends for a reward and actively promote this option. Through eye-catching buttons and push notifications, users are notified that money can be earned by referring friends. Inviting friends is simplified by convenient referral links and pre-written invitation texts. All three service providers reward users in the form of a commission rate of 15 or 20% on the trading fees of the referred users.

Offering a reward is likely to be an effective way to encourage users to perform a certain action. In this case, the reward may appear more lucrative to the user than it truly is. The emphasis is placed on the commission rate earned, which may appear high in absolute numbers, rather than on the fact that this rate concerns trading fees and the exact amount of these fees, which are relatively low. This reward

⁷ For people who are less digitally skilled, the registration process and specifically the identity verification part could be a barrier. This also applies to navigating the application in general. See: [Barriers to managing money online \(AFM, 2023\)](#)

⁸ [Corritore et al. \(2003\)](#)

⁹ [Acquisti et al. \(2017\)](#)

structure additionally ensures that the amount of the reward depends on the trading frequency of the referred users, suggesting that service providers aim to ensure that users not only refer friends, but also encourage them to trade more.

It is known from research that social networks are an important factor in making (financial) decisions.¹⁰ This is also the case for purchasing crypto.¹¹ It is therefore likely that an invitation from friends has a strong effect on consumers' decision to join the crypto market. Offering referral rewards therefore entails the risk that users for whom crypto products are not suitable will start trading. In addition, by doing so, service providers may create a feeling of *Fear of Missing Out* (FOMO) in people who do not (yet) trade in crypto but know that friends do.¹²

2.2 Users are steered when using the app

There is a huge number of crypto tokens in circulation and new crypto tokens are added every day. All observed service providers offer 200 to more than 300 different crypto tokens. Because of this abundance of options users will not be able to consider and compare all options due to cognitive and time limits. To deal with this situation, people generally use efficient choice strategies that require less capacity in order to reduce the number of options to choose from and to make a choice more easily. Examples include choosing the most well-known options, options most chosen by others, options shown first, or options that attract the most attention.¹³ The way in which different crypto tokens are displayed will therefore have an impact the choices users make. The fact that crypto is a complex product for (new) users and that it is difficult to understand the exact differences between tokens will contribute to these effects.¹⁴ The impact of this is likely to be less for users who have been trading crypto for a longer time

¹⁰ Bursztyn et al. (2014); Duflo & Saez (2003); Cai et al. (2015)

¹¹ Almeida & Goncalves (2023)

¹² Przybylski et al. (2013); Good & Hyman (2020)

¹³ Goldstein & Gigerenzer (1999); Barber & Odean (2008)

¹⁴ Chernev et al. (2014)

¹⁵ Chernev (2003)

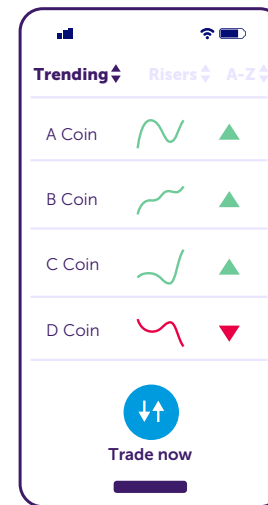
¹⁶ Orquin et al. (2021); Wolfe & Horowitz (2017); Understanding, Guiding, Measuring (AFM, 2021)

or users who already have a clear goal before entering the app.¹⁵ In addition, when navigating the apps, people will be directed towards activities that are highlighted (visually or otherwise) and that are easy to complete.¹⁶

In the apps of all three service providers, these mechanisms affect users in different ways. Users are steered both towards (easy) trading and trading in certain highlighted crypto tokens. This entails the risk of impulsive purchases and users purchasing crypto tokens or enabling additional services that are too risky and therefore not suitable for them.

This subsection explains the various observations related to guiding when using the app.

2.2.1 Users are steered towards certain crypto tokens



Users are steered towards trading in certain crypto tokens, such as trending or rising tokens.

To show the large number of crypto tokens, all studied service providers offer pages where options can be viewed in long lists ranked by various filters. All three service providers display the 'trending' ranking by default. It is unclear how it is determined which tokens are trending. It appears to be a combination of crypto tokens that are best known, have the largest market capitalisation (for example: Bitcoin and Ethereum) or tokens that have recently experienced a large increase. Two service providers provide lists ranked by highest rising or falling tokens based

on price changes. However, it is unclear which time period is used to determine the percentual fluctuations, and as a result, the precise basis for the ranking remains ambiguous. The other service provider offers the option of sorting based on the 24-hour price difference. In addition, two service providers offer the option to display a list of tokens that users can stake or lend, or a ranking based on highest lending or staking return. Finally, all three service providers offer a search bar that can be used to search for tokens and two service providers offer an alphabetical A-Z ranking. In addition to the rankings, one service provider refers to crypto tokens that are currently 'popular' in other places in the app. Here, too, it is not clear on what basis popularity is determined.

In scientific literature, the (number of) products users see and the way they are sorted or presented is sometimes referred to as the 'choice set'. Previous research shows that the way a choice set is displayed strongly influences the choices users make – and that there is no such thing as a neutral display of a choice set.¹⁷ Therefore, the order in which crypto tokens are displayed will affect users' choices. Higher-ranked crypto tokens are more likely to be bought than lower-ranked crypto tokens, because they attract more attention.¹⁸ In addition, the different rankings in the apps will cause users to pay more attention to the feature by which the list is sorted.¹⁹ In rankings with rising and falling tokens, users will focus their choice on the returns shown, so the time frame used for the ranking will influence the choice made by the user. Rankings of crypto tokens that allow users to activate staking or lending, along with sorting options by return amount, will encourage users to trade in crypto tokens that offer (the highest) staking or lending returns (see information block: what is staking and lending?).

¹⁷ [Johnson et al. \(2012\)](#); [Münscher et al. \(2016\)](#); [Szasz et al. \(2018\)](#); [Thaler & Sunstein \(2008\)](#); [Thaler et al. \(2013\)](#)

¹⁸ [Bar-Hillel \(2015\)](#)

¹⁹ [Gigerenzer & Todd \(1999\)](#); [Bar-Hillel \(2015\)](#)

²⁰ [Cialdini & Goldstein \(2004\)](#); [Sherif \(1936\)](#); [Melnyk et al. \(2021\)](#)

²¹ [Bouri et al. \(2019\)](#); [Almeida & Goncalves \(2023\)](#)

²² [Delfabbro et al. \(2021\)](#); [Gerrans et al. \(2023\)](#)

It is expected that the rankings with trending tokens and referrals to 'popular' tokens will exert the strongest guiding influence. This expectation arises not only because this ranking is the default among all studied service providers, but also due to research indicating that people are strongly influenced by the behaviour that is shown by other people.²⁰ Although it is unclear why these tokens are trending, users may form the impression that many other users are purchasing these tokens and that this is therefore a sensible decision.²¹ In addition, research shows that FOMO is an important factor influencing crypto trading, which may be further exploited by highlighting trending and rapidly rising tokens.²² Strong guidance towards certain tokens entails the risk that users will trade in crypto tokens that they might not have chosen otherwise and that are not in their own best interest.

Two service providers include a news section within their app. Alongside updates on current events in the crypto market and temporary promotions, these sections feature numerous articles focusing on specific crypto tokens. These articles elaborate, amongst other things, on why users should keep an eye on particular tokens in the near future or share price expectations. Additionally, they highlight, for example, top 10 lists of specific types of crypto tokens.

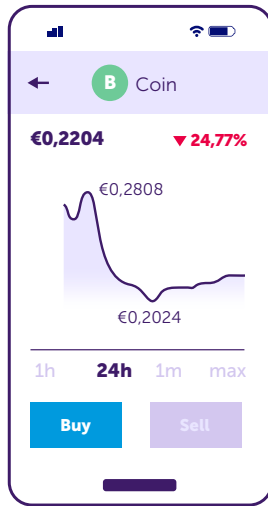
The news articles displayed in the apps could also be guiding users towards certain activities. It is probable that users will perceive certain posts as a recommendation to buy certain crypto tokens. This likelihood is heightened by the mix of news articles and items that resemble advertisements within these news sections, making it challenging for users to determine the objectivity of the content. Research on investing behaviour indicates that people react strongly to news items and that they affect trading decisions.²³ Consequently, this also leads to the risk that users may trade in crypto tokens that they would not have chosen themselves.

²³ Barber & Odean (2003); Mahani & Poteshman (2008)

What is staking and lending?

Crypto-assets use blockchain technology. A blockchain consists of blocks of transactions, which are validated by means of a consensus mechanism. The most well-known consensus mechanisms are Proof of Work (PoW) (used by bitcoin) and Proof of Stake (PoS) (used by Ethereum). With PoW, miners use computing power to check whether the transactions in a block comply with the rules governing the protocol and, once approved, add new blocks. They receive a reward for this; transaction fees and a blockchain subsidy. PoS operates similarly, with the distinction that blocks are validated not by miners, but by crypto-assets that have been locked (staked). The locked crypto-assets serve as validators that are allowed to randomly check transactions and add new blocks. In return, they receive the transaction fees and a blockchain subsidy as a reward. The greater the number of crypto tokens that are locked, the greater the chance of receiving a reward. Crypto service providers offer staking services to customers. Instead of being tech-savvy themselves, customers can have their crypto-assets staked through crypto service providers in exchange for a staking reward. Staking crypto-assets contributes to keeping the PoS protocol running and to the security of the network. The precise mechanics of staking may vary per crypto-asset. For some crypto-assets it is clear where the staking reward comes from. For other crypto-assets, the origin is less transparent. Staking entails quite some risks. For example, users may lose staked crypto-assets due to technical errors (slashing) or due to the staking provider going into liquidation. In addition to staking, some crypto service providers offer lending services to customers. In this case, a customer lends out their crypto-assets for a fixed fee; a rate of return. The way in which this return is achieved is often not transparent or identifiable for a customer. If the promised returns are high, the crypto service provider will have to take more risks to meet the promise. That is why, as a crypto owner, it is important to be well informed about staking and lending and who bears the risks when something goes wrong, for example when a party to which crypto-assets have been lent goes into liquidation.

2.2.2 Making purchases is effortless



Trading buttons are readily accessible throughout the app.

If the user decides to take action, a trading button is always within reach. For two service providers, the app has a central trading button positioned at the bottom centre of the screen, directly under the thumb. This button always remains visible and is denoted by two arrows. For one service provider, the trading button is less centrally located, and an alternative term is used to indicate it. In addition to these main buttons, users can also find buttons to buy or sell crypto on other pages. For example, all apps have pages on which individual crypto tokens are displayed together with very prominent buy and sell buttons. These buttons are visually highlighted using contrasting colours and large fonts. As the user navigates the page, these buttons scroll along ensuring they remain the only element consistently

visible on the screen. In this way users can always quickly make a purchase. Buying and selling is easy, a purchase is completed within three or four clicks. One service provider has built in an additional step where the purchase or sale needs to be approved with the login code.

The ever-present buy and sell buttons and the ease of completing a purchase entail the risk that impulsive choices will not be curbed. In general, the easier it is for people to perform a particular task, the more likely they are to complete it.²⁴ To ensure that users make wise decisions, small thresholds (sometimes called 'positive friction') in the decision process can encourage the user to pause and reflect on the purchase for a longer time.²⁵

²⁴ [Understanding, Guiding, Measuring \(AFM, 2021\)](#)

²⁵ [Kahneman \(2011\); Mills \(2020\); Sunstein \(2020\); Soman et al. \(2010\); Luo et al. \(2023\)](#)

²⁶ [Lapuz & Griffiths \(2010\); Raghurir & Srivastava \(2008\)](#)

For example, the fact that with one provider users must approve purchases with a login code can help mitigate impulsive or overconfident buying decisions.

Two service providers require money to be deposited before crypto can be purchased. One service provider offers the option of purchasing crypto directly via iDeal, in addition to the option to deposit money. All three service providers show iDeal as the default option for deposits. In addition, they all offer the option to deposit via bank transfers. Two service providers offer the option of paying with borrowed (or potentially borrowed) money, one via credit card and the other via PayPal (which can be linked to a credit card). One service provider displays deposited money immediately as credit in 'coins' instead of cash balance.

Offering the option of making a deposit with a credit card creates the risk of users trading with money they do not have or cannot spare. In addition, the automatic conversion of cash balance to 'coins' may not only lead to confusion about whether users have already purchased crypto, but also lower the barrier to trade. After all, money that has been converted into another form can cause people to distance themselves from the value, even if it is unchanged. This effect is similar to the effect that festival tokens or poker chips can have on purchasing behaviour.²⁶



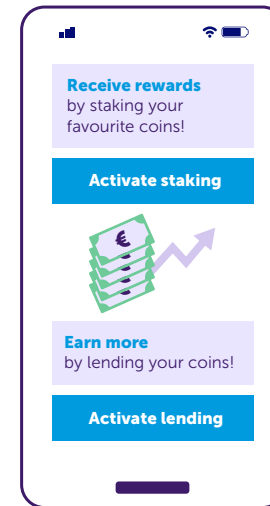
Few steps needed to make a purchase and trading with higher sums of money is made easy.

the service providers are very high, it creates the impression that trading in crypto with substantial sums is normal on this platform.

All observed service providers prominently feature an 'all-in' button during purchases, enabling users to use the entire available balance with a single press. One service provider shows the user four preselected amounts when depositing money: €25, €250, €1,000, €2,500.

The presence of default options, 'all-in' buttons, converting deposited money into coins and depositing money by credit card can contribute to users making choices that may not be in their best interests. These options make it even easier to trade and to trade with higher amounts. Research shows that default options significantly influence people's choices, particularly when the default option is interpreted as implicit advice or the most common choice.²⁷ Since three of the four preselected amounts shown by one of the

2.2.3 Activating staking and lending is encouraged



Staking and lending are heavily promoted.

In addition to encouraging users to trade in crypto, all apps prominently focus on the option to activate the additional services of staking and lending. All three service providers offer users the opportunity to earn additional rewards through staking or lending specific crypto tokens. These options are actively promoted in various ways and locations in the app. All observed apps use alternative terms that are linked to 'earning' and 'rewards' to refer to staking and lending. As a result, it is not always clear to users exactly what these services entail. Users are also encouraged to enable staking and lending by stating that they should let their crypto or money 'work for you'.

Two of the apps feature a persistent button specifically for staking and lending, ensuring it remains visible at all times. Clicking on this button directs users to a page dedicated to staking and lending. Here users can, amongst others, view staking and lending returns and they can enable these options. In the app of the other service provider a similar page can be found under account options. In addition, users are prompted to activate staking and lending on the pages of individual crypto tokens, as well as through news-, push- and pop-up messages. One of the service providers displays a full-screen message immediately upon users' first login to the app for the first time, informing them that it is time to start earning through staking and lending. Activating staking and/or lending is very easy, this can be done with one press of a button. For two service providers, the default setting is that when staking and/or lending is activated, this immediately applies to all crypto tokens for which this service is offered. One service provider offers the option of activating these services before crypto has been purchased.

²⁷ Jachimowicz et al. (2019)

With these providers, it is therefore possible that the option is automatically enabled after purchasing crypto that can be staked or lent. One service provider solely provides the option on a per-crypto-token basis, and only after the token has been purchased.

Given the central role of staking and lending in the apps of all observed service providers, it often appears that – alongside the trading buttons – this is the most important function of the app. This might give users the impression that activating these services is the norm. Together with the fact that it is so easy to activate these services, this entails the risk that users make ill-considered decisions without taking the time to properly educate themselves about the nature of these services and their associated risks. The default that activates staking or lending for all crypto at the same time will likely lead users to leave this on for all tokens. Partly because they will not bother disabling it one by one and partly because they may not be aware of it. This entails the risk that users may not realise that they are staking or lending (multiple) crypto tokens.

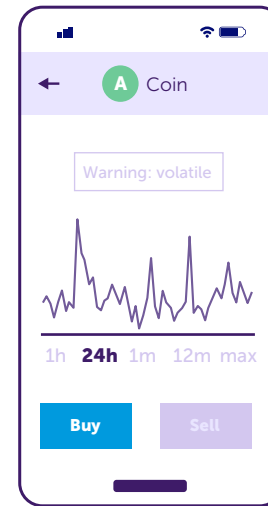
Moreover, the framing – the way in which options are described²⁸ – used in reference to staking and lending could also encourage users to activate these services. All studied apps employ terms for staking and lending that solely highlight the benefits of the services by emphasizing the ‘earning’ aspect, without addressing the underlying mechanism or associated risks. Users can be greatly influenced by the way choices are framed.²⁹

²⁸ [Tversky & Kahneman \(1981\)](#)

²⁹ [Ricciardi \(2008\)](#); [Tversky & Kahneman \(1981\)](#)

³⁰ [Disclosure: why it shouldn't be the default \(AFM, 2019\)](#)

2.2.4 Warning messages are displayed occasionally



Apps occasionally display warning messages, for example in case of volatile prices.

Occasionally, users are warned about the risks involved in trading crypto. During the observation period, one service provider showed a full-screen pop-up about the importance of acting consciously and trading with money that can be missed. Another service provider, sporadically, warned about the potential volatility and risks of certain tokens on pages dedicated to these crypto tokens. As mentioned before, the risks associated with crypto are also briefly addressed during the registration process of two service providers.

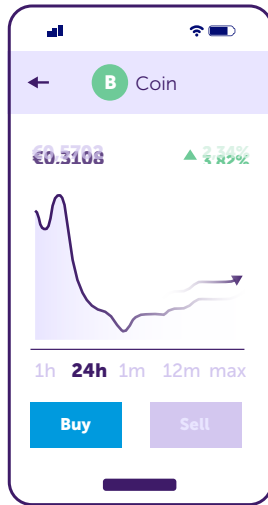
Although pop-ups and text boxes will alert some users to the risks of crypto trading, which may help them make a wiser choice, the effectiveness of warnings should not be overestimated. Research shows that consumers often ignore, fail to notice, misunderstand, or misremember warnings.³⁰

2.3 Activation to keep returning to the app

Both inside and outside the app – through push notifications – users are encouraged to take action in a variety of ways. This is often aimed at encouraging users to trade. Unlike the stock market, the crypto market is always open. In various ways, users are made aware that the crypto market is subject to constant changes and can be followed in real time.

Crypto has the potential to be highly absorbing for users.³¹ The different activation methods that are described below can encourage users to become highly engaged and active within the apps. This entails, amongst other things, the risk that users trade more than is in their own interests.

2.3.1 Real-time monitoring of the crypto market is encouraged



Users see prices changing real-time up to two or three decimal places.

In the apps of all three service providers, users can witness real-time fluctuations in crypto prices, displayed with precision to two or three decimal places. In the app of one of the service providers, whenever users land on a new page, they see rapidly ascending numbers until the current value is reached. Across all apps, users have the option to view the price of the individual crypto tokens. In various ways, the percentage change in prices is highlighted, showcasing this with either green (positive return) or red (negative return) numbers or arrows.

When users navigate to a page dedicated to individual crypto tokens or check their portfolio's value, they are presented with historical values displayed through a full-screen graph. For all service providers studied, the default display of the value is that of the past 24 hours. Users can choose to change this themselves to the past 7 days, the past year or all-time. Two service providers also offer the option of displaying values from the past hour. Current

changes are not only emphasized with respect to prices. When purchasing and selling crypto tokens, one service provider displays a countdown timer from 10 to 0 until a new offer appears based on the current price.

It is plausible that the ascending and descending numbers, the short-term display of the (often highly volatile) price and the countdown timer during purchases contribute to creating a sense of unrest and time pressure among users, fostering a focus on the short-term. This feeling of unrest could lead to the idea that one should regularly check the value of their crypto and could thereby result in highly engaged users and increased trading frequency.³² Previous research in the context of investing has shown that past returns are one of the most decisive factors selecting a financial instrument.³³ The way in which historical or expected returns are shown influences choices, with short-term frames being associated with more trading.³⁴ Since people are unable to weigh all available information when making choices, they often focus on information that is highlighted (visually or otherwise).³⁵ The explicit focus on short-term returns in all apps can therefore lead users to focus on this aspect when making choices, potentially encouraging more frequent trading.

³¹ [Delfabbro et al. \(2021\)](#)

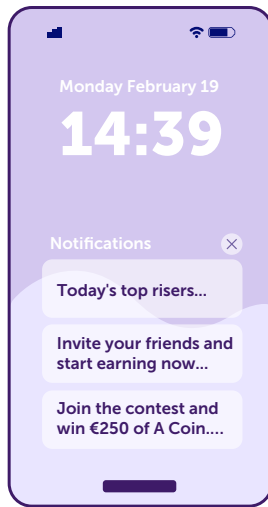
³² [Barber et al. \(2022\)](#); [Barber & Odean \(2008\)](#)

³³ [Wilcox, \(2003\)](#); [Barber & Odean \(2013\)](#)

³⁴ [Borsboom et al. \(2022\)](#)

³⁵ [Orquin et al. \(2021\)](#); [Wolfe & Horowitz \(2017\)](#)

2.3.2 Persuasive push notifications encourage users to open the app



Users receive persuasive push notifications, for example about temporary promotions or recent price changes of certain tokens.

Research in the context of investing shows that push notifications from investment apps lead to riskier trading behaviour, with this effect being strongest amongst men, new and younger investors.³⁶ It is possible that push notifications from crypto apps have a similar effect. Users who are currently not thinking about crypto, are prompted by push notifications to reopen the app. These notifications, which may highlight certain crypto tokens or actions like trading or inviting friends, will have a guiding effect towards these activities. It is likely that users interpret some notifications as recommendations to buy certain crypto tokens and consequently to act accordingly.

³⁶ Arnold et al. (2022)

All three service providers send push notifications which users receive as a pop-up on their mobile phone's home screen. The content of these push notifications varies. For example, users are informed of new crypto tokens added, crypto tokens that have recently risen or fallen sharply, temporary promotions or payment of lending and staking income. These notifications will encourage users to engage with the app. In addition, some notifications encourage users to trade in specific crypto tokens, which, for example, are rising or falling sharply or are newly offered. Push notifications often end with activating texts such as 'view', 'discover' or 'trade now'. The frequency of push notifications varies amongst the service providers, from several times a week to multiple times a day.

Research in the context of investing shows that push notifications from investment

Highlighting specific crypto tokens, for example those that are newly available in the app, could lead to the risk that users trade more and in tokens that they would not have considered otherwise.

2.3.3 Temporary promotions and prize contests encourage users to take action



Users are offered temporary promotions and prize contests.

one service provider also offers prize contests for specific crypto tokens or promotions tied to a special day of the year, such as Black Friday.

Within the app, and through push notifications and news items, users are presented with temporary promotions and prize contests. Examples of these promotions include temporarily higher lending returns on certain crypto tokens, temporarily increased rewards for referring friends, and trading fees that are waived during a specific period. In addition, one service provider offers a 'crypto of the week' promotion and organises 'buy & hold' campaigns around it. In this campaign, a certain amount of money is distributed to all users who have purchased a specific crypto token within a certain period of time (buy) and held it until a certain time (hold). All users who meet these criteria receive a portion of the available amount of money in proportion to the amount of crypto purchased. Finally,

In general, time pressure leads people to fear regret if they do not take action and to take less time to process information.³⁷ By generating a sense of urgency, users will generally act sooner and more swiftly.³⁸ These temporary promotions are therefore likely to prompt users to trade more frequently and more acutely. Finally, users may feel that deals are more profitable if the availability or time in which the deal is available, is limited.

Observations crypto app of foreign crypto service provider

For this study, the choice environment of the crypto app of one foreign service provider active in the Dutch market was examined. The observations of this app will be discussed in this box.

With this service provider, the registration process is also efficient and easy. In addition to identity verification, users must share more information than with the other service providers studied. Such as sources of income, expected trading behaviour, and proof of registration. Used devices must be confirmed via email. The app is automatically protected with the phone's access code. The app does not offer the option of inviting friends for rewards. Therefore, the risk that consumers for whom crypto is not suitable will start trading in it, appears to be slightly lower for this service provider compared to the other studied service providers.

The app steers users towards trading in certain crypto tokens by highlighting favourites and ranking popular tokens, risers, fallers, stablecoins and new tokens. In addition, trading is encouraged through prominent and central trading buttons. The app seems to be less inciting to activate users than the Dutch crypto apps. The app does focus on short-term returns but does not have real-time changing prices when navigating through the app. In addition, the app does not offer any temporary promotions or prize contests. Furthermore, there is no news section, and no push notifications are sent.

³⁷ Abendroth & Diehl (2006); Kerstholt (1994)

³⁸ Aggarwal & Vaidyanathan (2014); Lynn (1991)

Trading in this app is easy. Making purchases is further facilitated by displaying preselected amounts of €20, €50, €100 and €250. It is positive that these amounts are relatively low, and that the app also has a default trading limit setting of €5,000 per week. When confirming purchases, the user must swipe to confirm.

Users are offered the opportunity to trade quickly through full-screen pop-ups – which regularly come up. These pop-ups highlight three specific crypto tokens that users can purchase clicking just twice. This likely encourages users to trade in these tokens. This increases the risk that users will make choices that are not in their best interests or trade in products that do not match their risk preferences.

'Repeated trading' through direct debit is actively promoted in various places in the app. The activation of this option carries the risk that users forget they have it enabled or end up trading with higher amounts than they intended. To trade, users must first deposit money. The service provider also offers the options to deposit via PayPal, credit card and Apple Pay. These options increase the risk that users trade with (potentially) borrowed money. The app only offers the option of staking, not lending. Unlike the studied apps of the Dutch service providers, this option is not actively promoted in this app.

Finally, the app is only available in English; not in Dutch. This heightens the risk that Dutch consumers make uninformed choices or lack adequate understanding of the nature of the products in which they trade, due to language barriers.

3. Conclusion

The past years have witnessed a significant surge in the number of consumers active in the crypto market. Just as the number of independent investors has grown with the rise of execution-only platforms, apps from crypto service providers have made the crypto market accessible to a large group of consumers. The attention given to crypto trading on social media has also contributed to this surge. In preparation for the supervision of crypto service providers, the AFM is conducting exploratory studies into the crypto market. While the implementation of MiCAR will address some of the risks in this market, it will not be a solution to all risks.

The crypto market is easily accessible to a broad audience

The crypto apps examined in this study are all very accessible. Most consumers will complete the registration process quickly and easily. Furthermore, by offering referral rewards, the apps encourage current users to invite friends. This will likely have a strong influence on the decision of friends to start trading in crypto – partly driven by feelings of FOMO. The easy access and the offering of referral rewards both entail the risk that consumers for whom crypto is not a suitable product will also enter the crypto market. This could include consumers who cannot afford to lose the money they trade with, who are not well informed about crypto or the associated risks, or for whom the risk of crypto does not match their risk preferences. The quick registration process with identity verification can increase consumer confidence and further lower the barrier to become active in the crypto market. This also entails the risk that consumers for whom crypto is not suitable will trade in it.

Users are steered towards trading (with high amounts) in certain crypto tokens and activating additional services

Several elements in the apps may contribute to users making impulsive choices and spending (more) money on risky crypto tokens that they otherwise might not have chosen. While trading, there are few barriers that cause users to reflect on the choices they make. In addition, users are directed towards certain crypto tokens, for example through trending lists or news items. Trading with high amounts is made easier in various ways – such as ‘all-in’ buttons and preselected amounts when depositing money. The explicit focus on staking and lending in the apps of all service providers studied, the reward-frame used and the ease with which users can enable these services creates the risk that users enable these options without being properly informed of what they entail and the risks involved. In displaying these additional services, the apps focus primarily on the possibility to passively generate income, while it (often) remains completely unclear what these services include and what risks are involved.

Users are encouraged to return to the app and to take action

Both inside and outside the apps, users are activated in various ways to return to the app and keep taking action. Users are encouraged to closely monitor the crypto market, by showing (very) short-term returns and real-time changing prices. Even when users do not return to the app autonomously, they are prompted to do so by push notifications. These notifications often steer users towards taking certain actions, for example by highlighting rapidly rising or newly added crypto tokens (‘trade now’). In addition, temporary promotions offered can encourage users to act quickly, such as trading in crypto tokens that temporarily offer higher staking or lending returns. All these factors can cause users to become highly engaged with the app and trade more than is in their best interest. This also contributes to the potential of crypto that users become completely absorbed in it and start seeing it as a game. As users pay a fee to the crypto service

provider for every purchase or sale that they make, more trading will mainly benefit the service provider. Highlighting certain crypto tokens in push notifications and temporary promotions may additionally entail the risk that users trade in products that they might not otherwise have chosen. It is therefore important for users to be cautious not to be tempted to take certain actions prompted by these expressions.

More prominent steering in crypto apps than in investment apps

When comparing the choice environment of investment apps from regulated investment firms to those of crypto service providers, several differences and similarities stand out.³⁹ Because crypto service providers are subject to fewer customer onboarding regulations than investment firms, the registration process for crypto service providers is relatively short and efficient. For this reason, accessing these apps is quicker compared to investment apps. In addition, investment firms are subject to the Dutch ban on inducements. This prohibits them from offering users rewards for referring friends, while in crypto apps reward programs for referring friends are active and prominently displayed.

Compared to investment apps, users of crypto apps are more prominently steered. In investment apps, for example, users are less incited to trade. In crypto apps – both within the app and outside the app by means of push notifications – various techniques are used to activate users to trade and trade more frequently, for example by offering temporary promotions. Just like investment apps, crypto apps place a great emphasis on historical returns. In both markets, the time frames chosen by the service providers for displaying these returns are short – often showing the price of the last 24 hours. In addition, changes in prices are prominently displayed, for example by quickly changing green and red numbers.

³⁹ [Observing online investment platforms \(AFM, 2023\)](#)

⁴⁰ [Discussion Paper on MiFID II investor protection topics linked to digitalization \(ESMA, 2023\)](#)

Choice environment in legislation

At this moment, the AFM does not yet have a mandate that allows it to impose requirements on crypto service providers. As from December 2024, MiCAR will provide the AFM with tools to reduce some of the risks for consumers in the crypto market. However, not all problems will be solved with the entry into force of MiCAR. Under MiCAR, the AFM will also have a very limited ability to prevent crypto apps from guiding customers towards behaviour that is not in their best interests. The AFM can, however, set requirements for the provision of information in apps: it must be fair, clear and not misleading. Only when crypto service providers become subject to similar legal requirements as investment firms – similar to MiFID II – can the AFM monitor elements of online choice environment. Under MiFID II, requirements are imposed on the development and distribution of products with the goal of ensuring that products are sold only to consumers for whom those products are suitable. For example, companies are expected to take measures in the choice environment if they sell (complex) products online. For example, by taking into account how products are shown or not shown in the choice environment and the use of tools that can verify different characteristics of the target group. Consider, for example, high-quality appropriateness tests with strict passing criteria or tools that can be used to estimate customers' risk tolerance before complex and risky products can be purchased.

The AFM will share this report with other European supervisors and policymakers to stimulate the conversation about the choice environment of crypto apps. The AFM notes that several European bodies, such as ESMA, are drawing attention to the design of the online choice environment.⁴⁰ The AFM considers this a positive development and hopes that this report will highlight the importance of this subject in the context of crypto apps in the run-up to the evaluation of MiCAR and its expansion (MiCAR II). Although the AFM can and will not currently enforce this, it encourages crypto service providers to design the choice environment of their apps in the best interest of the customer.

Consumers must remain vigilant themselves, even after MiCAR takes effect

It is important that consumers active in the crypto market remain vigilant themselves. Crypto assets are high-risk products that seem to be suitable for only a very small group, and this will remain the case under MiCAR. As the value of crypto is largely determined by speculation, prices can fluctuate greatly within a short period of time. It is critical that consumers trade only with money that they have and that they can spare, and that they make informed choices by educating themselves about the nature of the products they purchase, including the associated risks, such as potentially extreme volatility.

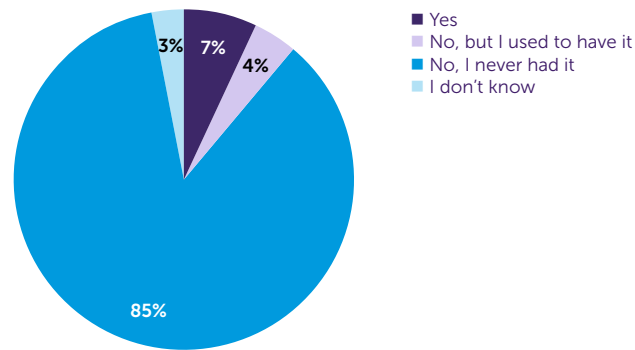
Appendix 1: Characteristics of crypto owners

In April 2023, a survey study was conducted on various financial topics amongst 1,163 Dutch consumers who are part of the LISS panel. The LISS panel is managed by Centerdata, an independent research institute. The panel has been selected in such a way that it is representative of the Dutch population.

In this survey, 7% of respondents indicated they owned crypto at that time. Another 4% reported having owned crypto before, but no longer owning it at that time.

Figure 1. Crypto ownership within total sample

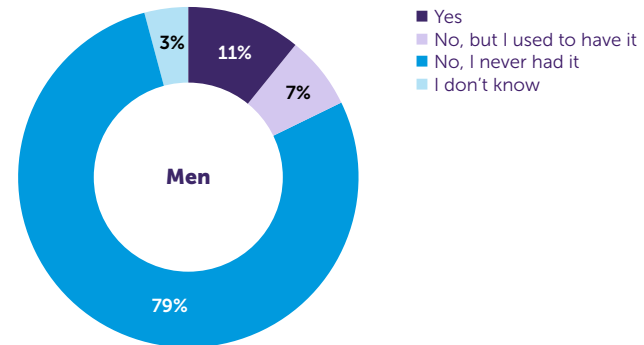
Do you own any money that only exists digitally (also called 'crypto')? An example is bitcoin. (n=1.163)



Crypto ownership is more common amongst men (see Figure 2), younger age groups (see Figure 3), and middle and higher educated people (see Figure 4).

Figure 2. Crypto ownership amongst men (upper figure) and women (bottom figure)

Do you own any money that only exists digitally (also called 'crypto')? An example is bitcoin. (n=532)



Do you own any money that only exists digitally (also called 'crypto')? An example is bitcoin. (n=630)

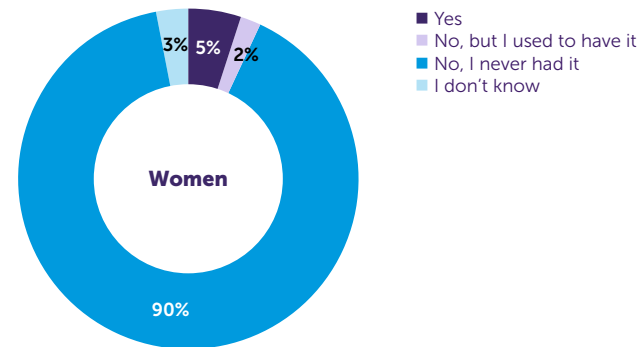


Figure 3. Crypto ownership by age group

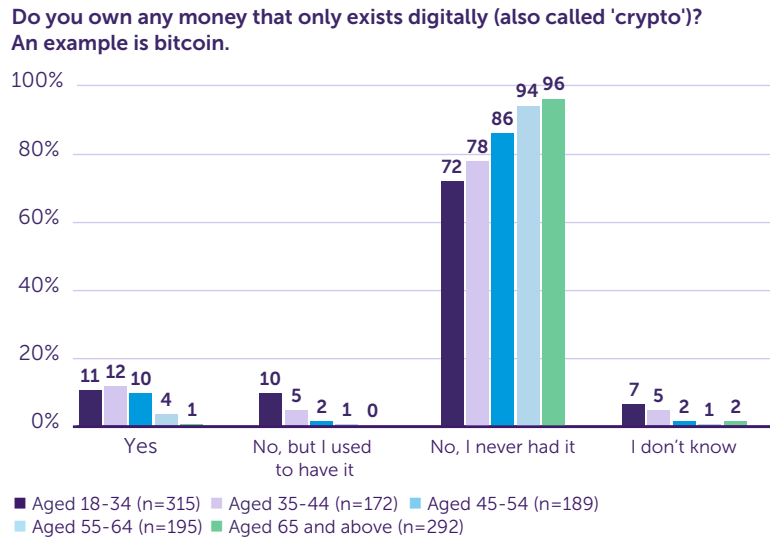
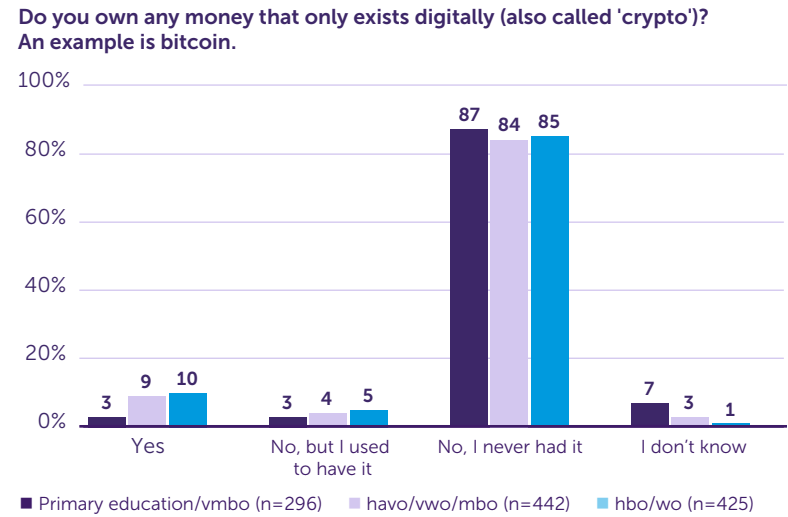


Figure 4. Crypto ownership by education level



Appendix 2: Research methods

To conduct this study, accounts were opened with three Dutch crypto service providers. Although the three service providers jointly serve a large part of the Dutch crypto market, it is important to mention that due to the small number of service providers examined, the results of this study only provide an initial indication of possible risks and cannot be generalised to a broader context. In addition, only the mobile application and the registration process were observed – the website and other communications of the crypto service providers were not taken into account. The study was conducted in November-December 2023. The observations described in this report are, therefore, a snapshot and it is possible that changes have taken place in the meantime.

The app of one foreign crypto service provider was also examined. Since it concerns only one foreign service provider, these observations are described separately from the observations in the other three crypto apps. The results can be found on page 17 of this report in the ‘Observations crypto app of foreign crypto service provider’ box. To assess the choice environment, a predetermined observation framework was used, that was filled-in for each service provider by two independent observers. This observation form is based on insights from behavioural science literature and is comparable to the framework previously used in the study into the choice environment of investment platforms.⁴¹

The elements inspected include, but are not limited to:

- Design
- Flow
- Use of banners
- Composition of the choice set
- Use of default options
- Historical or expected returns
- Social comparison
- Social interaction
- Rewards
- Scarcity
- Push notifications
- News reports.

⁴¹ [Observing online investment platforms \(AFM, 2023\)](#)