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RESEARCH PAPER

Value creation and capture in decentralized finance markets: Non-fungible tokens as a class of digital assets

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Abstract
Information technology (IT) has radically changed the financial services industry, with the most recent transformation toward Fintech and decentralized finance (DeFi), driven by blockchain. Especially, non-fungible token (NFT) assets within DeFi are redefining how value is created and disseminated, for instance, in the art industry. However, DeFi and NFT market dynamics are not yet well understood. Using a thematic analysis based on 14 interviews with major NFT stakeholders (i.e., marketplace providers, artists, and investing collectors), we identify these NFT stakeholders' different motivations and strategic options and explain the value creation and capture dynamics in the NFT art market resulting from their interactions. We argue for decomposing an NFT's value into an NFT-intrinsic and an NFT-extrinsic part. Finally, we elaborate that art NFTs are not a new class of assets because many of their properties are similar to related assets such as physical art and cryptocurrencies.

Keywords Decentralized finance (DeFi) · Non-fungible tokens (NFT) · Blockchain · Digital assets · Financial markets · Value creation

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Introduction

The financial services industry is undergoing substantial changes, mainly driven by information technology (IT) innovations, most noticeably illustrated by the emergence of Fintech and Fintech platforms (Ng et al., 2023; Puschmann, 2017). One of the drivers in Fintech is blockchain (Jourdan et al., 2023), which has enabled decentralized finance (DeFi). DeFi applications have recently grown rapidly and are projected to reach a global revenue of 17 billion US dollars in 2023 and 35 billion US dollars by 2027 (Statista, 2023). They allow for decentralized financial services and value creation by reducing the need for financial mediators (Cai, 2018). However, despite "decentralized" being part of the name of this new industry, DeFi businesses are designed and managed in a decentralized way to varying degrees, with applications governed by decentralized autonomous organizations likely being the most decentralized form (Katona, 2021). While DeFi covers a wide range of applications, in this research, we focus on a particular type of DeFi markets: non-fungible token (NFT) markets.

NFTs are unique and digitally traceable crypto tokens that are linked to underlying digital or physical objects (Schwiderowski et al., 2023). NFTs have gained great attention in academia (Taherdoost, 2023) and industry, especially with the sale of an NFT art piece for 69 million dollars at the auction house Christie's (Kugler, 2021). They are potentially radical innovations that could change digital business, for example, marketing, branding, and entrepreneurship (Chandra, 2022; Hakkarainen & Colicev, 2023), and life in general, for instance, education (Wu & Liu, 2023), by revolutionizing the storage, coding, exchange, embedding, verification, and authentication of unique digital content and assets (Wilson et al., 2022). NFTs are considered the enablers of the metaverse and web 3.0 applications (e.g., Hartwich et al., 2023; Kshetri, 2022) and create

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a parallel market for intangible assets like power, clout, and status (Kraizberg, 2023). One of the first industries disrupted by NFTs is the arts industry (Fairfield, 2022; Hartwich et al., 2023; Pawelzik & Thies, 2022), allowing for the democratization of access to art and financial innovations for more investments in creative work (Damodaran, 2023; Whitaker, 2019). Due to their novelty, DeFi and NFT markets (e.g., Dowling, 2022) are not yet well understood, with research only being at the beginning of analyzing value drivers and business models for stakeholders involved (e.g., Baytaş et al., 2022; Wilson et al., 2022). Three of the main stakeholders in NFT markets are NFT creators, who generate and sell NFTs; collectors, who invest in and resell NFTs; and platforms or marketplaces, on which NFTs are traded. So far, NFT creators (e.g., NFT artists) have been analyzed for their perceptions, practices, and challenges (Sharma et al., 2022) as well as motivations, needs, goals, and strategies for generating and selling NFTs (Pawelzik & Thies, 2022). NFT collectors and NFT platforms have previously been investigated by quantitatively analyzing NFT trading data (Horky et al., 2022; Kireyev, 2022). The focus has been on NFT investments, for example, by delineating investors by experience (Oh et al., 2022) or developing portfolio strategies (Ko et al., 2022).

We make two main contributions with this exploratory study of the emergent NFT art market. First, a more concise understanding of DeFi stakeholders based on primary data is needed to unravel the value dynamics in DeFi markets (Meyer et al., 2022). We hence explore the motivations and strategic options of NFT art creators, collectors, and platform providers to explain how their interconnected actions create value and how they can capture this value in NFT-based DeFi markets. The NFT platform providers we investigate in this paper are rather centrally managed, and thereby, they serve as re-intermediating actors (Feulner et al., 2022) in this particular DeFi market. By analyzing and decomposing value and strategic value dynamics in NFT markets, we explore value mechanisms in decentralized systems. Thus, our first research question is: *How is value strategically created and captured in NFT-based DeFi markets?*

Second, NFTs are digital or crypto assets (Aharon & Demir, 2021) that constitute information resource derivatives of the right to a value trade on a blockchain (Kud, 2019) and have been suggested to be a new class of assets (e.g., Dowling, 2022; Ko et al., 2022; Schaar & Kampakis, 2022). We formally discuss this claim using the example of NFT art by distinguishing NFT art from other types of DeFi tokens, cryptocurrencies, or physical art (Burniske & White, 2016; Campbell, 2008; Corbet et al., 2021). In this context, art NFTs are particularly interesting as their underlying artworks are investment opportunities in their own right (Campbell, 2008; Mamarbachi et al., 2020; Worthington & Higgs, 2004). Hence, our second research question is: *How can NFTs be considered a new class of asset?*

Methodologically, we conduct 14 semi-structured interviews with NFT art creators, collectors, and platform providers and analyze them via a four-step latent coding-based thematic analysis inspired by Braun and Clarke (2006) and Clarke et al. (2015). Contrary to other interview-based NFT market studies (e.g., Pawelzik & Thies, 2022; Sharma et al., 2022), we do not only include interviews with creators but also collectors and platforms, which allows us to explain the dynamics of their interconnected actions leading to value creation and capture.

This paper is organized in the following way. The "Literature Background" section provides an overview of the academic literature on DeFi, NFTs, decentralized value creation, and capturing, as well as NFTs as asset classes. The "Methodology" section describes our methodology and our analysis. The findings from this analysis are presented in the "Research and analysis" section and discussed in the "Discussion" section. We conclude this paper in the "Conclusion" section by summarizing our main findings.

Literature background

Decentralized finance

Fintech has been one of the main drivers of change in the financial services industry, encompassing a plethora of innovative ideas and new digital business models (Alt et al., 2018; Jourdan et al., 2023). As part of the Fintech movement, DeFi, a decentralized platform ecosystem in which financial services are provisioned by multiple market participants, intermediaries, and end users in a more decentralized way, came into existence (Eikmanns et al., 2023; Zetzsche et al., 2020). Blockchain-based DeFi integrates emerging technology into finance to create better services for users, thereby improving the entire financial services industry (N.-P. Chen et al., 2021; Gramlich et al., 2023; Popescu, 2020). DeFi also focuses on removing intermediaries by creating peer-to-peer connections in financial markets (Y. Chen & Bellavitis, 2019, 2020; Schueffel, 2021). This process ironically may lead to new types of intermediaries, like centralized exchanges in DeFi and Fintech systems (Cai, 2018; Feulner et al., 2022; Langley & Leyshon, 2021).

Distributed ledger technology provides the technological underpinning of DeFi. Most DeFi applications are built on the Ethereum blockchain using smart contracts (Meyer et al., 2022). Smart contracts allow the protocol to provide financial services without a central financial service provider (Schär, 2021). In other words, DeFi comes with the prospect of a more decentralized, innovative, interoperable, borderless, and transparent financial system (Y. Chen & Bellavitis, 2020). However, DeFi markets are also characterized by high levels of price co-movement and fluctuations (Chohan, 2021;

Park et al., 2022). These price variations, unclear regulation, and potential financial crimes lead to high uncertainty about its future (Tapscott, 2021; Werner et al., 2021).

The objects traded in DeFi are referred to as crypto or tokenized assets (i.e., digital representations of physical or digital assets), which induce socio-technical systems around which communities form (Schwiderowski et al., 2023). Tokenized assets do not have to be traditional securities (Sockin & Xiong, 2023); they can, for example, also take the form of tokenized digital or physical artworks (Schueffel, 2021). As a result, some literature claims that new types of assets with new features, such as NFTs, are created and available for collectors and investors on these markets (Chohan, 2021).

Many DeFi trades take place on more or less decentralized platforms (Harvey et al., 2021) involving market participants such as investors, arbitrageurs, users, liquidity providers, and aggregators (Jensen et al., 2021). However, despite the increasing academic interest in DeFi, extant literature still lacks insights into the dynamic interactions between stakeholders, such as platform providers in DeFi markets (Meyer et al., 2022).

Non-fungible token markets

NFTs form their own markets (Kaczynski & Kominers, 2021), which are a particular form of DeFi markets. An NFT is a crypto token that links to an underlying object or asset (Schwiderowski et al., 2023). It is a unique and irreplaceable digital object that indicates ownership and can be traded (Valeonti et al., 2021; Wilson et al., 2022). The underlying object can take several forms, such as digital art or collectibles (e.g., images, videos, audio), digital trading cards, in-game items, domain names, digital real estate, event tickets, or even tweets (Fortnow & QuHarrison, 2021a; Hartwich et al., 2023).

Through tokenization (i.e., the creation of a digital representation of an asset on a blockchain) (Sockin & Xiong, 2023) and the fractionalization of ownership of NFTs, it is possible to transform previously relatively illiquid assets, such as fine artworks, into more easily tradable ones (Kong & Lin, 2021). Typical advantages of NFTs over traditional forms of trading assets are faster and cheaper transactions, higher accessibility, more reliability, and greater transparency. On the other hand, there are regulatory concerns, security issues, and cumbersome user interfaces to NFT markets, limiting their use (Ramakrishnan & Benson, 2021). Furthermore, NFT markets are perceived as highly unstable and erratic (Mazur, 2021; Mukhopadhyay & Ghosh, 2021): Prices of NFTs and collectibles are driven by different factors, including proof of provenance, historical significance, sentiment, condition, or collection completion (Fortnow & QuHarrison, 2021b). In NFT markets, the scarcity of NFTs and the fear of missing out are considered to be driving forces for buyers (Przybylski et al., 2013).

Some of the main NFT stakeholder groups include NFT platforms, NFT creators, and NFT collectors/investors (Pawelzik & Thies, 2022; Wilson et al., 2022). NFT creators and collectors are connected on more or less decentralized NFT platforms, which can operate as open collection-based or curated marketplaces for all minted (i.e., newly created) NFTs (Bodó et al., 2022). Examples of such NFT marketplaces are OpenSea, Nifty Gateway, SuperRare, and Foundation, with OpenSea by far being the largest (Tapscott, 2021).

One phenomenon associated with NFTs and collections of NFTs is that they tend to form active communities, where their stakeholders interact with each other, for example, on Discord channels (Pawelzik & Thies, 2022; Sharma et al., 2022). Part of the experience that NFT creators derive from their work is related to being part of a community and working on NFTs, with value creation often achieved in a collaborative way (Kaczynski & Kominers, 2021; Pawelzik & Thies, 2022). Certain NFTs are also considered cultural status symbols, for example, in the form of avatars (Chohan, 2021; Sharma et al., 2022).

Value creation and capture in NFT-based DeFi markets

In general, there are two different ways to conceptualize value. *Use value* is the value perceived by a customer and can be translated into the price a customer is willing to pay for a product or service. *Exchange value* refers to the actual price of a product or service: the monetary value realized during a transfer (Bowman & Ambrosini, 2000). Value can further be distinguished into internal (e.g., shareholder) and external (e.g., customer) value (Bititci et al., 2004) or into intrinsic (i.e., non-derivative value of a certain kind) and extrinsic (i.e., derivative value of the same kind) value (Zimmerman, 2002). In an economic context, value can be created and captured. *Value creation* is the attempt of an actor to increase value, while *value capture* is the process of securing pecuniary or non-pecuniary returns from value creation (Chesbrough et al., 2018). The focus on how value is created has changed over time from company internal value creation over value creation in networks and interactive value creation to value co-creation between companies and their trading partners (Redlich & Moritz, 2016).

With the advent of blockchain technology, a technologically enabled distributed or even decentralized form of value co-creation in the shape of service co-creation has emerged (Mačiulienė & Skaržauskienė, 2021). The value of blockchain-enabled NFTs has been found to be linked to their scarcity, attribution to a particular creator, provenance, historical significance, popularity, and growth potential (Murray, 2022). NFTs, hereby, can be perceived as tools for market design and their underlying value is driven by the size and cohesiveness of their community (Kaczynski &

Kominers, 2021). Moreover, NFT creators and holders can realize the value differently, for instance, via traits or royalty fees (Hartwich et al., 2023). However, research on NFTs so far has not shed light on how the strategic interplay of different NFT market stakeholders creates value in a decentralized way and how these stakeholders can capture this value. Furthermore, while NFTs have been found to have economic or financial value, for instance, as part of a more comprehensive investment portfolio (Ko et al., 2022), and have at least some value originating from their underlying asset such as artworks (Fridgen et al., 2023), extant literature has not yet concisely distinguished and analyzed different value components of NFTs. How the different value components of NFTs are mutually and decentrally created and individually captured by the stakeholders in NFT markets is hence another main contribution of this work.

NFTs as asset class

In the extant literature, NFTs have frequently been mentioned as a new form of asset or asset class (e.g., Dowling, 2022; Ko et al., 2022; Schaar & Kampakis, 2022). However, it is still unclear whether NFTs genuinely form a new class of assets (e.g., Ante, 2021). A formal discussion of this assertion is one of the objectives of this study.

In general, assets are physical or digital objects that comprise rights or claims concerning tangible or intangible properties. Typically, they are investments intended to realize financial returns (Nam et al., 2008). As NFTs are digital objects indicating ownership in some underlying physical or digital object that can be used as investment, they fall under these definitions and can hence be considered (economic) assets. On the other hand, it is less clear whether they indeed form a new class of assets. An asset class can be defined as a set of assets that bear some fundamental economic similarities to each other and have characteristics that make them distinct from other assets (Greer, 1997). Thereby, three generic asset classes (i.e., capital, consumable, and store of value assets) can be differentiated (Greer, 1997). The second part of the definition follows that for NFTs to be a new asset class, they would need to be different from all other assets. However, NFTs share some commonalities with other digital and crypto assets such as Bitcoin (Burniske & White, 2016). In addition, they inherit characteristics of their underlying objects. This is especially relevant in the case of art NFTs because art has long been seen as an asset class itself: artworks have been considered capital assets that yield their owners financial value (Campbell, 2008; Soloveichik, 2010; Stein, 1977), as consumable assets that provide non-pecuniary value to their owners (Mandel, 2009, 2015; Stein, 1977), or as stores of value and wealth (Anson, 2002; Burniske & White, 2016; McAndrew, 2012a). However, physical artwork can be cumbersome to trade and, as such, may be considered a rather unattractive investment class (Kräussl et al., 2016; Mandel, 2015) compared to more liquid art NFTs (Wilkoff & Yildiz, 2023). Nonetheless, artworks can rise drastically in price over time and are increasingly used as a form of investment (Campbell, 2008; Kräussl et al., 2016; McAndrew, 2012b). Finally, recent research indicates that from a financial perspective, art NFTs might be more similar to other crypto assets than to artworks, given that their prices mainly depend on the prices of their cryptocurrency of denomination (Anselmi & Petrella, 2023).

Methodology

This research uses an inductive exploratory approach to investigate NFTs as assets and strategic options of different stakeholders within NFT asset-based DeFi markets to create and capture value. Our empirical base consists of interviews conducted with three stakeholder groups: NFT platform providers, collectors, and artists. We conducted semi-structured interviews to better investigate the NFT market relations and dynamics from each stakeholder group's perspective. From the literature, we derived two categories of questions for the interview guide dealing with NFTs and the NFT markets, respectively. Similarly, the literature also stated different relations and interactions between platform providers, collectors, and artists, which we explored from each stakeholder's point of view by determining their strategic options, their motivations, and the conceptualization of NFT value. As a result, three interview guides were created to gather the different perspectives and give insights into NFTs as assets and digital objects of value. Each of the three interview guides consisted of five categories: the NFT; the NFT market; as well as the relationships between platform providers, collectors, and artists, where each category contained three to five questions (cf. Appendices 1, 2, 3). To ensure the validity of categories and questions within each of the interview guides, an industry expert (co-author), working with NFTs since 2015 and trading on various NFT markets, was asked to provide feedback on the structure and selection of categories, along with clarity and value of the questions (cf. Fig. 1, step 1). The interviewees were selected using a two-step approach combining the knowledge from the earlier mentioned industry expert and a snowball sampling technique. For identifying interviewees in the NFT market (cf. Fig. 1, step 2), we contacted platform providers, collectors, and artists from the network of the industry expert. In the second part, for gathering more interviewees, we used the snowball sampling technique and asked interviewees, if they knew other stakeholders whom we could interview (Saunders et al., 2009). This two-step approach for selecting interviewees was conducted to reduce bias and to explore more stakeholders' points of views on the NFT market. In

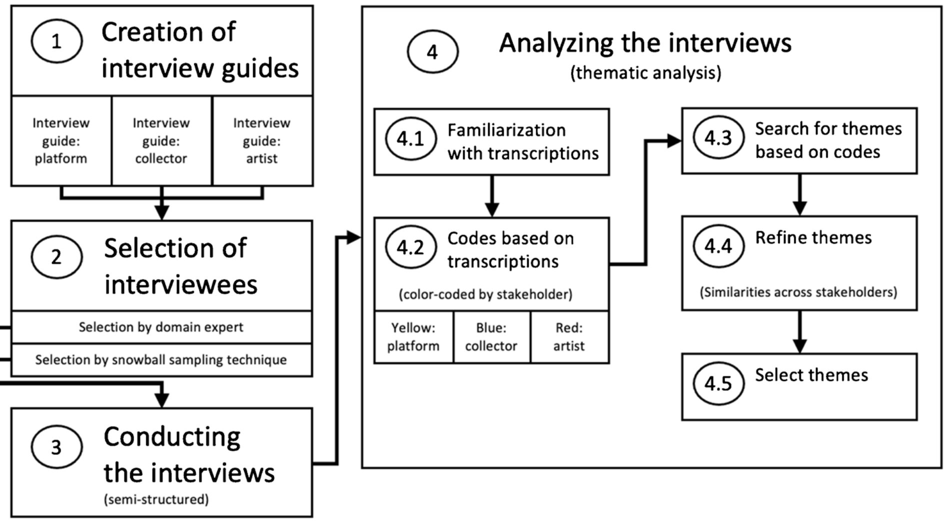

Fig. 1 Research approach to investigate NFTs as assets and strategic options of different stakeholder groups within NFT-based DeFi markets

total, we carried out 14 interviews (cf. Table 1) with the first round in January and the second one in March 2022. This allowed us to collect approximately 11 h of interviews (cf. Fig. 1, step 3), which we transcribed for further analyses.

The qualitative data derived from the interviews were analyzed using a thematic analysis approach (cf. Fig. 1, step 4) to identify themes around recurrent impressions, beliefs, and meanings that describe NFT-based DeFi markets from the stakeholders' perspectives (Clarke et al., 2015). The analysis was conducted by two of the authors of this article. In the beginning, we independently reviewed and familiarized ourselves with the transcriptions especially looking for patterns in the data (cf. Fig. 1, step 4.1). In the following, we collapsed the data into codes relevant to the research questions using minimal interpretation (cf. Appendices 4, 5, 6). We further systematically color-marked each stakeholder group to cluster the different perspectives, impressions, and meanings (cf. Fig. 1, step 4.2). Then, we merged our independently derived 423 codes and assessed them based on interpretations and patterns of meaning (e.g., value-related, strategic options-related) at a latent level (Braun & Clarke, 2006) searching for overarching themes (cf. Fig. 1, step 4.3). Finally, we derived such themes using an iterative process which combined, split, added, and removed codes. We were hence able to identify the relevant underpinning aspects and to improve the clarity of the core concept of each of the themes (cf. Fig. 1, step 4.4). This iterative process ended as consensus was reached and seven themes remained from the analysis. The first three themes, (1) *stakeholder motivation*, (2) *artistic value*, and (3) *commodity value*, focus

Table 1 Description of the interviewed NFT stakeholders

Key ref.	Interviewee	Location	Active since	Background for selection
1–A	Artist	US-TX	2017	2000+ minted NFTs
2–C	Collector	EU-FR	2018	30+ owned NFTs and metaverse museum creator
3–C	Collector	US-NY	2017	300+ owned NFTs and large collector on SuperRare
4–P	Platform operator	US-DE	2018	6000+ unique artists and collectors on platform
5–A	Artist	EU-IT	2018	100+ minted NFTs and among first 100 artists on SuperRare
6–P	Platform operator	AS-SG	2021	Fully regulatory compliant (i.e., anti-money laundering and know-your-customer) NFT platform
7–C	Collector	US-GA	2019	4000+ owned NFTs
8–C	Collector	EU-DK	2021	Collector's portfolio contains some of the first NFTs, like CryptoPunks
9–A	Artist	EU-DK	2021	Fine art photographer who became an NFT artist
10–A	Artist	AF-SA	2021	50+ minted NFTs for fundraising campaign
11–A	Artist	EU-DK	2021	Unique algorithmically minted collection of 5000+ NFTs
12–AC	Artist, collector	EU-DK	2020	Artist and collector of NFTs
13–C	Collector	EU-UK	2017	Collector's portfolio contains CryptoPunks
14–P	Platform operator	EU-UK	2021	Blockchain-based and artificial intelligent-powered platform for digital assets

on the value creation and capture in NFT markets, whereas the remaining four themes, (4) *NFT-focused*, (5) *NFT market-focused*, (6) *trading strategy-focused*, and (7) *risk mitigation-focused*, relate to strategic options for creating and capturing value across the three stakeholder groups (cf. Fig. 1, step 4.5). Our empirical findings are described in the next section.

Research analysis

In our analysis, we discover seven main themes. The first three themes relate to value creation and capture in NFT art markets (*stakeholder motivations*, *artistic value*, and *commodity value*); the other four describe strategic options for creating and capturing value (*NFT-focused*, *NFT market-focused*, t*rading strategy-focused*, and *risk mitigation-focused* options) across the three examined NFT stakeholder groups.

Value creation and capture in NFT markets

We start our analysis by exploring the pecuniary and non-pecuniary motivations as well as the mechanisms of NFT stakeholders to create and capture the different value components (i.e., artistic and commodity value) of an NFT (cf. Table 2).

Motivations for value creation and capture

NFT platforms offer marketplaces on which NFTs can be traded. They have both pecuniary (e.g., profit) and non-pecuniary objectives, like driving a new art movement or contributing to a new digital lifestyle (4–P, 6–P, 14–P). NFT platforms can be more centralized (e.g., OpenSea) or more decentralized marketplaces. The three platforms whose operators we interviewed are decentralized to different degrees and have different foci. 4–P operates a curated platform for rare NFT art on Ethereum and trading via non-custodial and custodial wallets. 6–P runs a centrally managed platform as a multiple NFT marketplace built on Concordium. 14–P operates a payment platform built on a self-developed blockchain and offers wallet and custodial services. For example, NFT platforms can enable matchmaking among users via auctions (3–C, 4–P). They mainly earn money via commissions collected every time an NFT is traded. For instance, on OpenSea, a 2.5% commission fee applies to every transaction (Jiang & Liu, 2021). This implies that the setting of the commission fee and the number of trades conducted on the platform are two determining factors of a platform's financial success.

Artists are attracted by the NFT space as it allows for new forms of artistic expression and alternative ways of revenue generation. Our interviews with 1–A and 12–AC show that being part of a new type of art movement and the experience of creating digital art and putting it up on a blockchain can be valuable in itself for artists. From a financial perspective, the fast-growing and easily accessible NFT art market promises artists more financial independence and an opportunity to make a living through their art (7–C). Artists can generate revenue in two ways: by selling created NFT artworks on the primary market and by obtaining royalties when their artworks are resold on secondary markets. Hence, there are two major determining factors of value generation for NFT artists. First, artists can create valuable art pieces underlying an NFT. Second, they can implement a royalty model for their NFT. The captured value then depends on the set prices and the demand for the NFT (12–AC).

For collectors, there are at least two potential reasons why they get involved with NFT art: They might be art enthusiasts with an esthetic interest in a piece, or they might be investors, treating artwork like a commodity that can be

Table 2 NFT value creation and capture

		Platforms	Artists	Collectors
Motivation	Non-pecuniary	Driving art movement; having new lifestyle	Driving art movement; experiencing art	Experiencing art
	Pecuniary	Making profit; revenue growth	Making profit for financial independence	Making profit; NFTs as retirement savings; financing more art sales
Artistic value	Value creation	Curating NFT artist and art piece	Creating an NFT art piece	Collaborating in creating an NFT art piece
	Value capture	-	Owning an NFT art piece	Buying and owning an NFT art piece
Commodity value	Value creation	Driving demand for an NFT art piece; market-making	Driving demand for an NFT art piece	Buying an NFT art piece, driving demand for an NFT art piece
	Value capture	Imposing and receiving commission fees on NFT sale	Setting price and receiving marginal value from NFT sale; imposing and receiving resale royalty fees	Setting price and receiving marginal value from NFT sale

profitably resold. Art-loving collectors are interested in experiencing art and may use money generated from NFT art sales to buy more art (2–C). Investment-focused collectors, however, may use NFT art as a long-term investment or for speculation in the short run (9–C). Art-loving collectors need to develop a strategy to find the art pieces that best align with their artistic preferences. Investors are profit maximizers working within a set of budgetary constraints.

Interview 8–Collector
I see [an NFT] as an investment vehicle for my personal pension fund

NFT value components

The value of art NFTs is decomposed into two elements (cf. Fig. 2). The *artistic value* depends on the prevailing perception of the underlying artwork's value. It is co-created by NFT artists, who generate the actual NFT art piece; collectors, who support NFT artists in this creation (e.g., by making design suggestions) (3–C); and NFT platforms, who curate and especially present NFT art pieces, thus extending them (3–C, 10–A). NFT artists and collectors can capture and benefit from the artistic value of an NFT art piece by owning and holding it. NFT platforms cannot own NFTs; hence, they cannot capture their artistic value.

The *commodity value* is defined as a buyer's willingness to pay for an NFT (4–P). It can be disintegrated into different fees, such as *commission fees* of platform providers (2–C) and *resale royalties* of artists (12–AC). Moreover, some fees are collected by the validators of the underlying blockchain, like *transfer fees* (e.g., Ethereum's gas fees), which are levied every time a transaction is executed (12–AC), and *minting fees*, which need to be paid when an NFT is minted (3–C). Given their low strategic relevance, we do not consider other fees like deposit, withdrawal, or listing fees here. Furthermore, an NFT's commodity value also encompasses a market price component, which we call marginal value. The commodity value is co-created by NFT artists and platforms that engage in activities driving up the demand for an NFT art piece as well as by NFT collectors who acquire an NFT art piece. On the secondary market, NFT collectors also try to increase an NFT's demand. Besides, NFT platforms engage in market-making activities, thus facilitating the exchange between buyers and sellers. NFT artists capture parts of an NFT's commodity value either by selling it on the primary market or through resale royalty fees on the secondary market (2–C). The collector of an NFT captures its commodity value by selling it and keeping the difference between the sale price and the fees. NFT platforms capture a part of the commodity value through commission fees on NFT sales (2–C). Given the higher strategic relevance, we mainly focus on the commodity value component of NFTs in the following.

Strategic options for NFT value creation and capture

NFT platforms, artists, and collectors have a range of strategic options for generating and capturing an NFT's value. These options can focus on NFTs, NFT markets, trading strategies, and risk mitigation.

NFT-focused options

Strategic options around NFTs are mainly concerned with NFT type, quantity, and quality. NFT artists generate the underlying NFT artworks and hence the artistic value of an NFT. They need to decide whether to create few but high-quality NFT artworks or vast amounts of NFTs. The underlying artwork of an NFT can be a single piece or part of a collection (e.g., CryptoPunks). In general, highly creative NFT art pieces or rare ones which are part of collections are likely more precious to the market (6–P). Platform providers need to decide which NFTs can be sold on their platforms and may choose to specialize in certain artist groups or kinds of art. 4–P and 6–P focus on high-end artists, whom they invite to sell on their platforms (curation) and have an established assessment and quality assurance process for artists (6–P).

Investing NFT collectors need to opt for whether they prefer buying expensive higher quality NFTs or lower

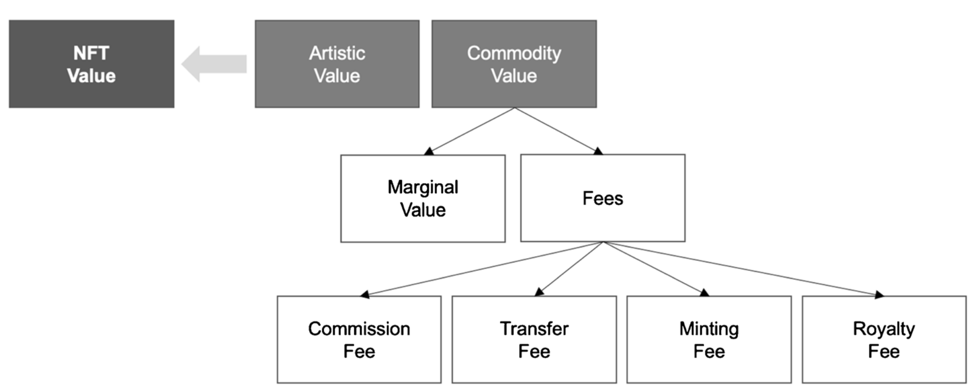

Fig. 2 NFT value decomposition

quality works for lower prices (8–C). In addition, they need to decide which pieces to sell and which to hold in hopes of an increase in value.

Market-focused options

Platform providers can use various approaches to the NFT market: Platform providers 4–P and 6–P apply a focus strategy by concentrating on high-end artists. 4–P does so, for instance, via an internal committee that decides on the artists to approve. Provider 14–P uses a differentiation strategy by establishing themselves as a lifestyle brand. Provider 6–P, however, also uses elements of a cost-driven strategy by building their platform on Concordium, which uses a proof-of-stake consensus mechanism and is less energy- and transfer fee-intensive than Ethereum, on which many other platforms are built.

The NFT space is very community-based (Sharma et al., 2022). Collectors and artists are often willing to help platforms improve. Hence, it is crucial for platforms to have close contact with major customers and implement their feedback (14–P). A platform's reputation is essential because a bad customer perception can swiftly lead to their migration to other platforms. For instance, one of the most prominent NFT collectors, 3–C, has stopped trading on platforms they believed were engaging in fear-of-missing-out schemes and misleading customers with their website design.

Another option for platforms is increasing their customer base by targeting actors from the traditional art space and through internationalization (6–P, 7–C). In particular, the move from restricted and local physical to global and digital NFT art markets allows more users to enter the art space (7–C). This entails the need for marketing and communication measures like spotlights, hangouts, and social media. Communication in the NFT space often occurs on social media, particularly Twitter (e.g., 5–A, 9–A, 10–A, 12–AC, 2–C, 7–C, 8–C).

Moreover, there are different ways to enter and position in the market. Platform 6–P, for instance, starts by inviting high-end artists, who they hope will attract other artists to their platform. They then target collectors to buy on their platform in hopes that their activity might attract other collectors.

Platforms need to appeal to users to attract and retain them because many artists and collectors are active on multiple marketplaces (e.g., 1–A, 2–C). Our interviews have shown that ease of use and a straightforward design are perceived positively (1–A, 9–A). Example features that enhance ease of use are the possibility of different payment methods (e.g., credit cards, cryptocurrencies), mobile applications, high interoperability, and easy registrations (7–C, 13–C, 4–P, 6–P).

It is also necessary for platforms to ensure security and transparency (6–P, 12–AC, 15–P), for example, through price transparency and steering clear of fear-of-missing-out sales mechanisms (12–AC, 3–C). Other features like chat functions (13–C) or countdowns (12–AC) are positively perceived too. Platforms also need to decide to which extent to operate in a decentralized way and which blockchain to adopt. The choice of an underlying blockchain comes with trade-offs. For example, using a more secure and established protocol like Ethereum comes with huge transfer fees and longer processing times compared to other blockchains (4–P, 6–P).

> Interview 6–Platform
> *We obviously want to be positioned around the authenticity of the platform, as opposed to the fake hype.*

Platforms are perceived as service providers in the NFT market (2–C). Specialized smart contract providers are expected to enter the market, replacing these platforms over time due to lower costs or even free smart contract services for artists and collectors to trade directly (9–C). On the other hand, 14–P outlines that the complete substitution of centralized platforms by decentralized and algorithmic alternatives is unlikely. This is because platforms lower the market entry barriers for artists and collectors as less technology-specific knowledge is required from them, and there would still be services that blockchain solutions alone cannot offer (e.g., indexing of artworks).

> Interview 2-Collector
> *It's the platform, they provide a service, which is that the artists can tokenize their work on their platform.*

For NFT artists to generate revenue and thus income, their works need to be popular and publicized to drive up prices (11–A). Artists gain advantages from being active in the NFT community, which can facilitate the creation of buzz or *hype* around their work (5–A, 9–A). Creating hypes requires a network, especially among collectors and other artists, via social media (5–A). For artists, as with platforms, reputation in the community is essential. Trades are often made between parties who know each other. A negative reputation can separate an artist from the community (9–A). In general, advertisement and communication on social media as well as collaboration with platforms can be helpful (5–A). NFT artists also collaborate with platforms, helping them to improve their service offerings and, in return, receiving recommendations for their work and advertising support (14–P).

> Interview 14-Platform
> *[The platform] makes it possible for any artist that does not have any knowledge regarding blockchain to mint the artwork.*

Investing NFT collectors want to acquire and resell NFTs at a profit. Therefore, they need to identify artworks and artists that are underpriced or that might become popular in the future. For this, NFT collectors need to learn about NFTs, NFT artists, and other collectors, which can be facilitated by being involved in NFT communities (10–A, 12–AC, C–2, 3–C). Such involvement and in-depth market analyses can facilitate talent scouting and treasure hunting in the market (8–C). Collectors may also guide artists or even ask them to create specific artworks, which can then be bought from the artist and resold (5–A). However, for this to be profitable, it requires an in-depth understanding of what the market wants. Collectors also need to create attention and interest for NFTs they wish to sell, for instance, by talking about them on social media or to other collectors in the community (e.g., 2–C, 3–C, 8–C). Here again, a good reputation can play an important role.

Trading strategy-focused options

NFT platforms, artists, and collectors can send and receive various signals to enhance their trades. An NFT platform, for example, could prominently display recently minted and traded NFTs on their website. Signals allow collectors to easily see where the market interest is and use this information in their trading decisions. Providing customized recommendations and displaying relevant statistics (e.g., floor prices or trading volumes) can also be sources of guidance.

One of the strongest signals NFT artists can send is to sell out their available works (11–A). This indicates a strong market interest in the works of this artist, which drives up the interest in their future works. On the other hand, a failure to sell out makes creating interest in an NFT artist's work much harder and could harm the artist's reputation with collectors in the long run (12–AD). Therefore, NFT platforms and artists must cooperate and tightly coordinate their advertising and communication.

NFT collectors, too, can increase their chances of selling NFTs by sending initial signals about the NFTs they want to sell. Getting the attention of the rising number of speculators can help drive up the price of the NFT.

NFT markets are characterized by erratic behavior with sudden, massive hype waves around certain NFTs that can last from 24 h to 2 weeks (8–C). Therefore, NFT stakeholders should be open to receiving signals from the market, which might help them identify where the current market interest is and forecast where it might go (10–A). For example, NFT platforms and artists can use market and social media analyses and their contacts in the NFT community. Analyzing their buyers' and sellers' earlier trades enables platforms to identify potentially suitable matches (4–P). They can then target advertising about specific artists to identified collectors (e.g., via recommendations).

Receiving and quickly reacting to market signals is vital for investors hoping to profit in such an environment. They can do so, for example, by following the social media activities of owners of vast amounts of cryptocurrency (sometimes called "whales") and other influencers to track the activities of their wallets (8–C). NFT markets tend to exhibit herd behavior, and the activities of the big players are one of the primary triggers for market shifts. Collectors also closely watch the activity of other collectors and artists who specialize in similar artworks (5–A). Furthermore, they can use technical analysis methods and tools tailored to the NFT market. On a basic level, this could be statistics regarding floor prices, trading volumes, or fee statuses (7–C, 8–C). Collectors who keep tabs on such publicly available metrics and upcoming exhibitions and auctions and combine it with personal knowledge about specific artists and interests of whales can gain a competitive advantage.

Another strategic option for the stakeholder groups is the setting of prices. Platforms such as 4–P and 6–P can set their commission fee, which is usually a percentage added on top of the price of an NFT. Many platforms choose to have a relatively low and transparent commission fee. However, platforms can set this fee in line with their preferences and use it as a strategic instrument and signal to the market. For example, they can demand different fees for different types of NFTs or align an artist's fee with their market share. Platform 4–P, for instance, requires different fees from its customers depending on whether they use custodial or non-custodial wallets to access the platform.

Platforms like 14–P build their application on top of their own blockchain, allowing them to collect minting and transfer fees and avoid having to charge high commissions. Platform 14–P also sells their own NFT artworks on their platform, which enables them to reap a larger part of an NFT's commodity value.

NFT artists can set the prices that they ask for their works. Setting the price of an NFT within a reasonable range is important: an excessively high price may be perceived as overconfidence, whereas low prices cast doubt on the artwork's quality (10–A). As a first anchor point, NFT artists can consider prices of similar art pieces on the traditional art market or prices set by similar NFT artists (11–A). They may also test the market value of their NFTs by selling them under a pseudonym (1–A). However, strategically setting an initial price somewhat below the first anchor point might increase the pool of interested collectors (9–A, 10–A). Finally, it is possible to set a royalty fee on some platforms, which allows artists to benefit from the resales of their NFTs (12–AC).

Investing NFT collectors need to make two price decisions: at which price to buy and at which price to sell NFTs. The interviews revealed that NFT collectors use a range of trading strategies. One strategy is to buy NFTs with low floor prices. In these cases, search mechanisms and overviews of recently minted NFTs on platforms are helpful.

These NFTs are held until their first price peak and then sold (8–C, 12–AC). Another strategy is to buy an NFT whose floor price has just started to rise (indicating potential hype) and sell it at the top of the wave (8–C, 12–AC). This is a risky strategy, as prices of hyped NFTs increase quickly but then drop and stabilize at a low level after the excitement has cooled. In these cooler phases, NFTs are highly illiquid. Collectors must wait for another hype to sell their NFTs expensively (8–C, 12–AC). Another strategy can be to hold NFTs through hype waves and intermediate low tides, hoping that an even bigger hype emerges. Buying an NFT at a low floor price and selling it at the peak of a hype wave can be seen as an NFT value investment strategy. Purchasing an NFT whose floor price is already increasing and selling it around a peak of a hype wave can be regarded as an NFT growth investment strategy.

Risk mitigation-focused options

The NFT market is very volatile, making it crucial to mitigate the risks prevalent in this market to capture value. In our interviews, respondents mentioned two main risks relevant to platforms. First, highly volatile transfer fees on established blockchains can make up a substantial part of an NFT's price. To mitigate this risk, companies could opt for using their own blockchain and building their platform on top of it. Second, the shifting regulatory landscape is a significant concern for platforms. Some platforms take precautionary measures. Platform 6–P, for example, requires that users reveal their identity to enter; this allows the platform to prepare for possible future anti-money laundering and know-your-customer regulations.

New NFT artists often lack knowledge about NFT markets and blockchain technology. Experimenting and testing the market thus helps mitigating specific risks, such as being cheated by more experienced market actors and sending wrong signals to the market (e.g., setting an inadequate price). There is also the risk of NFT artists to get locked into a specific NFT platform. Often, artists are active on several platforms simultaneously to mitigate this risk (9–A, 10–A). Some NFT artists have considered creating and trading via their own smart contracts instead of using platforms (e.g., 5–A); this approach has the additional benefit of circumventing platform commission fees.

One risk that NFT collectors face is uncertainty about the underlying asset's condition and origin (and even existence). While the NFT is easily trackable thanks to blockchain, it is difficult for potential buyers to ensure that the underlying asset is in the promised state. Being involved with the NFT community and knowing the artists and collectors from whom NFTs are purchased drastically reduces this risk (3–C, 12–AC).

It is also hard and risky for collectors to identify the ideal time to sell an NFT (i.e., the peak of a hype wave). First, there is no guarantee that a particular NFT will ever be hyped and that a sale will generate a high profit. Second, the waves driving up the price of an NFT can be very short-lived (8–C). It is paramount for collectors to analyze the market thoroughly to find the right time, especially during hypes (8–C). NFT value investors may consider risk diversification over several NFTs. The idea is to buy several NFTs at a low price to increase the chances that at least some of them will be hyped and can be sold at a high price covering the costs of the non-profitable ones (8–C).

Discussion

Theoretical implications

This research makes two theoretical contributions. First, it extends the literature on economic value especially in decentralized systems by explaining how value is strategically created and captured in an open and decentralized way in NFT markets. Second, it adds to the research on assets and asset classes by discussing NFTs as a new class of assets.

Open decentralized value creation and capture in NFT markets

In DeFi and NFT markets, several stakeholder groups create and capture value through intertwined actions (Meyer et al., 2022; Wilson et al., 2022). This study shows NFT platforms', artists', and collectors' range of strategic options to create and capture value. The different types of strategic options (i.e., NFT-, NFT market-, trading-, and risk mitigation-related options) are hereby exercised in a specific order, which induces different phases of NFT market dynamics. Initially, the NFT needs to be created, which requires the different stakeholders to exercise their NFT-related options. For instance, artists need to decide on the type of art and whether they want to create a collection of NFTs, whereas NFT platforms opt on whether they want this NFT to be put up for sale on their platform. NFT collectors decide which type of NFTs they are interested in and whether for artistic- or commodity-related reasons. After an NFT is created, the different stakeholders create a market or even an ecosystem for this specific NFT (Kaczynski & Kominers, 2021) by exercising their NFT market-related strategic options. For example, NFT platforms, often in collaboration with especially artists but also collectors, develop an advertisement and presentation strategy for an NFT to make it more popular and facilitate the creation of a community around it (Sharma et al., 2022). Communities around tokens are essential for the token to sustain and remain relevant (Schwiderowski et al., 2023). Once a market for an NFT is created, trading-related strategic options can be exercised. This involves particularly the sending and receiving of relevant signals as well as the setting of prices. After these primary market actions have been completed, an NFT enters the secondary market, in which the three stakeholder groups iteratively engage in reshaping their market- and trading-related strategies based on their learnings under changing environmental conditions, such as general hype waves and regulation changes. Risk mitigation-focused strategic options play a crucial role in each of these phases. For instance, NFT artists test and experiment with their NFT works and the market reacts to them during the NFT creation phase and during the NFT market creation phase. Fintech platforms such as NFT marketplaces need to be aware of the risk of regulatory changes and ideally build options into their business design in order to react to these changes adequately and quickly (Ng et al., 2023). NFT collectors can use trading strategies that reduce the risks of high losses due to the erratic and hardly predictable nature of NFT markets (e.g., Mazur, 2021).

Through their intertwined actions, the stakeholders co-create value in the form of services in a decentralized way enabled by blockchain (Mačiulienė & Skaržauskienė, 2021). DeFi marketplaces such as decentralized exchanges or more or less decentralized NFT platforms play a paramount role in the generation of these financial services and bring about a form of re-intermediation in DeFi and Fintech markets in general (Feulner et al., 2022; Langley & Leyshon, 2021). It is intriguing that, despite not actually being needed for coordinating transactions in blockchain systems, there are platforms with strong elements of centralization (e.g., the offering of custodial wallets as well as the presence of centralized management teams and vetting committees deciding on which artists to invite on their platform) in these markets. Some of the identified reasons for their presence are lower market search and screening costs, higher price transparency, a better user experience, enhanced decision support, and the possibility of a closer connection between artists and collectors. Apart from providing such services, centralized platforms also reduce the technical complexity inherent to blockchain-based systems for users such as artists and collectors and make the technology and applications built on top of it more accessible.

Furthermore, our analysis indicates that the value of an NFT consists of two components: The *artistic value* of an NFT is mainly generated by NFT artists who create the physical or digital artwork underlying an NFT. However, NFT platforms contribute to creating an NFT's artistic value by curating the art piece and thus extending it. Collectors can also play a part in this, for instance, by supporting artists or making suggestions. NFT artists can capture this value by keeping the NFT after its creation and NFT collectors by buying and gaining ownership over it. As an NFT's artistic value stems directly from the NFT, it is considered *intrinsic* (Zimmerman, 2002).

The *commodity value* of an NFT is chiefly generated by collectors who buy (exchange value) or are willing to buy (value-in-use) this NFT. However, NFT artists and platform providers who engage in activities that raise an NFT's demand (e.g., advertising and communication, sending signals) and provide market-making services also contribute to the generation of commodity value (Mačiulienė & Skaržauskienė, 2021). NFT platforms can capture parts of this value via commission fees. NFT collectors can do so by selling an NFT art piece on the secondary market and keeping the difference between the selling price and the imposed fees (i.e., an NFT's marginal value) (Hartwich et al., 2023). Finally, NFT artists have mainly two ways of capturing an NFT's commodity value: They either capture the marginal value of an NFT by selling it on the primary market or collect royalty fees on the resale of an NFT on the secondary market (Hartwich et al., 2023). As external market forces drive an NFT's commodity value, it is considered *extrinsic* (Zimmerman, 2002).

Figure 3 summarizes our findings and depicts the NFT market actors and their strategic options. Thus, we contribute to the literature on economic value creation and capture by shedding light on new and blockchain-based forms of open and decentralized value creation and capturing in NFT markets. Our model also helps to open up the inner workings of NFT markets, which are often perceived as a black box due to their high volatility and the apparently erratic behaviors of their actors (Mukhopadhyay & Ghosh, 2021).

NFTs as new asset class

Our findings suggest that NFTs do not represent an entirely new asset class but are instead a novel combination of existing ones. NFTs inherit characteristics from both blockchain-based crypto tokens such as payment tokens (e.g., Bitcoin) and their physical or digital underlying assets (e.g., artworks).

This becomes apparent when examining art NFTs through the lens of the earlier mentioned super asset classes (Greer, 1997). While there is debate around whether art pieces can be considered capital assets, this classification is clearer for art NFTs. Art NFTs are more financially liquid than, for instance, paintings on canvas (Wilkoff & Yildiz, 2023). Our findings indicate that the NFT art market is far less segmented, more international, and, in general, more open than the traditional art market. It is particularly the commodity component of art NFTs that allows this classification. In this sense, art NFTs are like cryptocurrencies even though their volatility is higher and their level of liquidity lower (Anselmi & Petrella, 2023). We have seen that analyzing market signals and using certain growth and value investment strategies occur in NFT art markets, again indicating that art NFTs might be regarded as capital assets (Greer, 1997).

NFT art pieces can also be considered consumable assets (Mandel, 2009, 2015; Stein, 1977). As with traditional art,

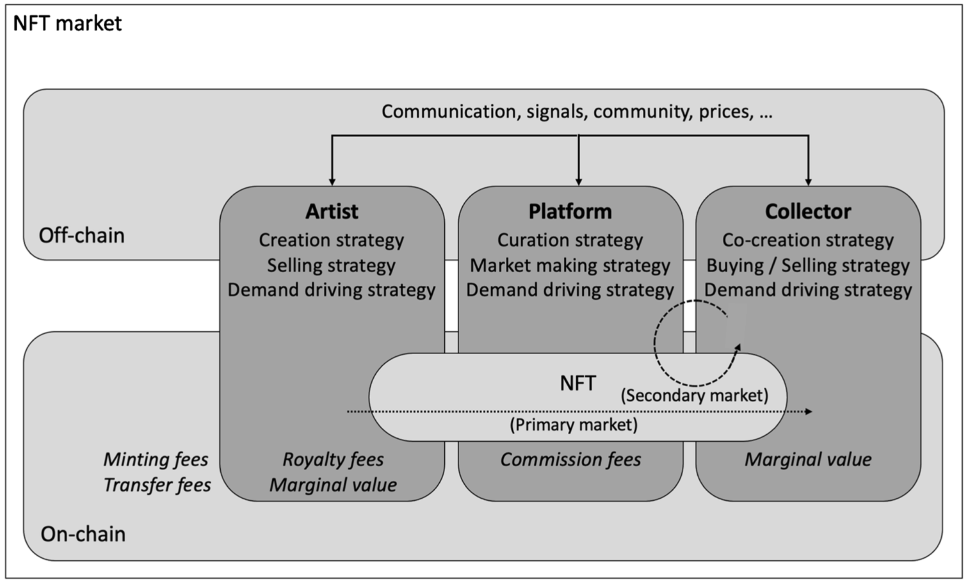

Fig. 3 Value creation and capture in NFT markets through interactions of stakeholders

consumption occurs here by enjoying the experience of owning and looking at a piece of art. This clearly links to the artistic part of an art NFT, which is the second value component of the NFT value (cf. Fig. 2). Unlike, for instance, cryptocurrencies, which have only an inherent commodity value, art NFTs can offer their owners a huge non-pecuniary utility originating from their underlying asset (Fridgen et al., 2023). The artistic value might even be more substantial when an owner boasts a collection of art NFTs. Moreover, for the value aspect of blockchain technology (Murray, 2022), which ensures that NFTs are stored in an immutable and verifiable way, artists see value in being remembered and ensuring the origin of the art piece.

Like traditional art, art NFTs can be seen as stores of value (Anson, 2002; Burniske & White, 2016; McAndrew, 2012a), especially in the case of long-term investments. Independent of what happens to the volatile commodity value of an NFT, it will keep an artistic value. This artistic value also fluctuates, for example, with specific art fashion trends. However, these variations are likely to be less erratic than variations in commodity value, a feature that NFT art has in common with traditional art. A peculiarity of NFT art is that the NFT is stored on-chain, separate from its underlying off-chain artwork. If a physical artwork is destroyed, it loses its total value and can no longer serve as a store of value. An NFT, however, continues to exist on a blockchain even if its underlying work is destroyed. Nonetheless, whether such an object could still be considered a store of value remains to be seen. If, instead, the NFT gets burnt on a blockchain, the underlying artwork could continue existing and serving as a physical store of value. Again, the fact that an NFT has an underlying work of value distinguishes it considerably from fungible tokens (Anselmi & Petrella, 2023).

Finally, in the light of the current decline of the NFT market, the differences between the artistic and the commodity value of an NFT art piece become even more apparent. While the demand for and hence commodity value of many NFTs is currently dropping, the artistic value of an NFT is still determined by the subjective judgments and preferences of the NFT's holder and beholders. Only if they enjoy the NFT less for its artistic aspects, its artistic value drops. Hence, seen as capital assets, NFTs are losing value under the current market conditions as the part of the community interested in the commodity value of NFTs is shrinking. At the same time, they can still be consumed by and serve as stores especially of the artistic part of their value for their holders.

Practical implications

This study has several implications relevant to practitioners, especially NFT creators, collectors, and platforms. When entering the NFT market, creators might want to experiment with the underlying technologies (i.e., blockchain and NFTs) and test the market and their work initially to get a grip on this highly technology-based market and assess their market value. It is also vital for them to become visible and build a network with other creators, from whom they can learn, and potential collectors, who help them develop. Also, the decision to use and the choice of a platform to engage on as well as the setting of market prices and royalty fees are crucial and should be considered carefully. This is especially true given that selling out NFTs seems to be one of the strongest positive signals a creator can send to the market.

Investment-focused collectors especially need to be aware of the hype dynamics and potential bandwagon phenomena in NFT markets. There is a mix of different options they can explore to keep an up-to-date knowledge and overview of this highly unstable and volatile market. These encompass personal ties with NFT creators and platform providers, the use of tools for fundamental technical analysis, and the consideration of benchmarks like the behavior of whales and influencers in the market. Risk mitigating measures such as diversifying investments and avoiding investments during NFT hypes can be considered too, no matter which investment strategy (e.g., growth and value investment) is followed.

NFT platform providers should be mindful of the importance of their design decisions in both user experience and technical terms. This especially refers to the choice of blockchain to build their platform on, as this can significantly affect the fees that go along with NFT trades and the degree of decentralization they want to exert. Having a completely decentralized system based on smart contracts could increase transaction speed and reduce the costs for the platform provider (i.e., less infrastructure, fewer resources) and the users (e.g., through less and lower fees). However, it could also take away the precious personal relationships with the users. This would reduce the platform to a mere match-making mechanism that could be easily abandoned in favor of another platform offering a better solution. One of the main advantages of centralized platforms seems to be the additional services they offer creators (e.g., marketing) and collectors (e.g., statistics and data for building investment strategies). This needs to be cherished if such re-intermediating platforms want to prevail over potentially cheaper and quicker algorithmic solutions. A good reputation in the market where collectors and creators pick up on and punish misconduct is also essential.

In general, the different stakeholders in NFT-based DeFi markets need to be aware that they create value in a collective way and that the overall value they can share among themselves gets more the better they do so. The actions of NFT creators, collectors, and platform providers are deeply entangled, leading to a high dependency between these stakeholders. Our data indicates that it is predominantly a subset of NFT artists, collectors, and platforms actively engaging in NFT communities that drives the NFT space and benefits the most in both pecuniary and non-pecuniary terms.

Limitations and future research

There are a couple of limitations to this research. In our value decomposition model, we consider many aspects implicitly (e.g., the roles of technology enthusiasm and ownership transparency), which could be modeled differently. Furthermore, our analysis also refrains from analyzing the effects of having portfolios of NFTs; we lack data on this point, and our respondents did not mention it during the interviews. However, studies of traditional art markets have shown that art collections are more valuable than individual artworks combined: for instance, a Picasso collection is more valuable than the sum of individual paintings or a similar number of paintings by multiple artists. Another limitation is that we only interviewed between three and six persons from each of the three stakeholder groups, which might not be enough to capture all dynamics and value creation and capturing forms in NFT markets. In our analysis, we only focused on NFT platforms that have strong elements of centralization. However, research on value creation and capturing as well as strategic decision-making in decentralized platforms and exchanges is also needed. Lastly, we only researched the market for NFT art. The analysis of other forms of NFT markets, such as those for gaming NFTs, music NFTs, and NFTs used for marketing purposes, could provide additional insights into NFT market dynamics.

For future research on NFT markets, we recommend having a deeper look into the investment strategies of the different stakeholder groups. With decentralization being one of the core principles of blockchain systems, it is also relevant to gain a more holistic understanding of the business model and strategic options of both centralized and decentralized NFT platforms. Other researchers may wish to further ground and extend our findings by using quantitative data sources and methodologies (e.g., behavioral experiments) to test the art NFT market and value model statistically. Another angle could be to analyze other DeFi and NFT markets unrelated to art to examine whether our findings are generalizable. Moreover, we encourage other researchers to delve deeper into analyzing blockchain-based systems using the lenses of service co-creation and ecosystems. Finally, more research on DeFi in the context of Fintech, particularly on value creation and capture mechanisms in DeFi markets, is needed.

Conclusion

Financial technology and most recently DeFi have revolutionized the financial services industry. Analyzing a particular instance of DeFi markets, the NFT market, we make two major contributions to the fields of Fintech and blockchain with this research. First, we find that the value of an NFT is collectively generated in a decentralized way by pecuniarily and non-pecuniarily motivated stakeholders such as NFT creators, collectors, and platform providers. These stakeholders have a range of strategic options for creating and capturing an NFT's value. Of particular importance here are NFT communities as well as sending, reading, and quickly reacting upon signals in NFT markets. We further discover that an NFT's value can be disassembled into an NFT-intrinsic part derived from the NFT's underlying asset and an NFT-extrinsic commodity component driven by the market.

Second, we argue that NFTs are not an entirely new class of assets, but rather a unique combination of other asset classes. They mainly inherit characteristics from their underlying assets and other types of blockchain-based crypto tokens, such as cryptocurrencies. We find support for seeing art NFTs as capital, consumable, and stores of value assets.

They are more liquid than traditional art assets but less liquid than cryptocurrencies. Their artistic component allows their owners to consume experiences associated with them and makes them stores of value, similar to traditional art pieces.

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