**Blockchain Frontier Technology (B-Front)**
Vol. 6, No. 1, July, 2026, pp. 38∼49
E-ISSN: 2808-0009 | P-ISSN: 2808-0831, DOI: 10.34306


# Non Fungible Tokens (NFTs) Marketplaces and Their Economic Implications

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**Article Info**

***Article history:***

Submission, 08-01-2026
Revised, 18-02-2026
Accepted, 07-03-2026
Published, 26-03-2026

***Keywords:***

NFTs
NFTs Marketplace
Digital Assets
Price Volatility
Economic Implications

**ABSTRACT**

**The development** of blockchain technology has driven the emergence of Non Fungible Tokens (NFTs) as unique digital assets traded through specialized marketplaces, forming a new digital economic ecosystem. Despite the rapid growth of the NFTs market, issues such as price volatility, the dominance of speculative activities, and uncertainty regarding long-term economic value remain insufficiently understood in academic studies. This **research aims** to analyze the role of NFTs marketplaces in shaping the economic value of digital assets, identify the factors influencing NFTs price dynamics, and evaluate the economic implications of the NFTs market for creators, investors, and marketplace platforms. This **study employs** an empirical quantitative approach by utilizing NFTs transaction data obtained from the OpenSea API, NonFungible.com, and CryptoSlam. The variables analyzed include NFTs prices, trading volume, liquidity, creator reputation, rarity score, and asset category. Data analysis is conducted using statistical and econometric methods to identify price determinants and market dynamics. The **results indicate** that NFTs values are significantly influenced by scarcity levels, creator reputation, asset utility, and the visibility provided by marketplaces. Marketplaces play a crucial role in shaping liquidity and market expectations, but they also contribute to increased volatility and speculative tendencies. This **study concludes** that the NFTs market has the potential to generate real economic value, yet it continues to face risks related to speculation and instability. These **findings contribute** theoretically to the digital economics literature and provide practical implications for the development of a more sustainable NFTs ecosystem.



DOI: https://doi.org/10.34306/bfront.v6i1.1060


## 1. INTRODUCTION

The development of blockchain technology in recent years has given rise to various digital innovations that transform how value is represented and exchanged, including the emergence of Non-Fungible Tokens (NFTs) as unique digital assets whose ownership can be transparently verified through blockchain networks

[1]. The non-replicable nature of NFTs has encouraged creators, artists, and game developers to utilize them as new monetization instruments, while marketplaces such as OpenSea, Rarible, and Magic Eden provide the infrastructure that enables the creation, distribution, and trading of NFTs within a rapidly growing digital economic system [2].

From a blockchain perspective, NFTs marketplaces operate on distributed ledger infrastructures that ensure decentralized ownership verification, immutable transaction records, and transparent price histories. Smart contracts deployed on public blockchains automate core market functions, including asset minting, transfer of ownership, royalty enforcement, and transaction settlement without centralized intermediaries. In this context, NFTs marketplaces should be understood as distributed ledger–based applications rather than conventional digital platforms [3, 4]. All pricing signals, ownership transfers, and liquidity movements are generated and recorded through on-chain transactions that are transparent, immutable, and verifiable by market participants. Consequently, NFTs price formation and liquidity dynamics are inherently shaped by blockchain infrastructure, where smart contract execution, transaction finality, and decentralized ledger transparency function as core economic mechanisms within the marketplace [5]. These on-chain mechanisms significantly reduce information asymmetry and transaction costs while simultaneously enabling new forms of market microstructure dynamics, such as programmable royalties and algorithmic visibility, which directly influence NFTs liquidity, valuation, and speculative dynamics through blockchain-native mechanisms such as immutable transaction finality, programmable execution logic, and real-time on-chain data availability [6].

Amid this growth, the NFTs market faces several challenges related to price volatility, speculative activities, and uncertainty of value, which are often influenced by community sentiment and the utility of individual digital assets [7]. Unpredictable market risks, limited information availability for market participants, and the potential for manipulative practices further increase the complexity of the ecosystem. These conditions suggest that the economic sustainability of NFTs requires a deeper understanding, particularly regarding how value is formed and how marketplaces influence this process [8, 9].

In the academic context, research on NFTs remains limited and leaves several important gaps. Quantitative studies examining price formation mechanisms are still scarce, resulting in an incomplete understanding of the factors influencing NFTs values [10]. Studies addressing long-term economic implications for the creative industry and the broader digital ecosystem are also relatively rare. Moreover, the business models of NFTs marketplaces including fee structures and royalty mechanisms have not been comprehensively discussed in the existing literature [11]. These gaps highlight the need for research that provides a more structured explanation of NFTs market dynamics [12].

Based on these conditions, this study is designed to address the following three main research questions:

- How do NFTs marketplaces contribute to shaping the economic value of unique digital assets?
- What factors influence NFTs price dynamics?
- What are the economic implications of the development of the NFTs market for creators, investors, and marketplace platforms?

These questions form the basis for the research objectives, which focus on explaining NFTs market mechanisms, identifying price determinants, and analyzing the economic impacts generated by digital asset trading activities [13].

Overall, this study is expected to provide scientific contributions by offering a more comprehensive understanding of how the NFTs market operates, how digital asset value is formed, and how marketplaces play a role in maintaining stability and sustainability within the ecosystem [14]. In addition to enriching the literature on digital economics and blockchain technology, the findings of this research may serve as a practical reference for industry players, policymakers, creators, and investors in assessing the potential and risks associated with the continuously evolving NFTs market [15].

Beyond academic and practical contributions, this research is also relevant to the Sustainable Development Goals (SDGs), particularly those related to innovation, economic growth, and the digital creative industry. The development of NFTs and blockchain-based marketplaces has the potential to support SDGs 8 (Decent Work and Economic Growth) by creating new income opportunities for digital creators without traditional intermediaries, as well as SDGs 9 (Industry, Innovation, and Infrastructure) through the use of digital

technology to build a more inclusive and decentralized economic infrastructure. For example, NFTs allow creators to receive direct payments and resale royalties, while blockchain-based marketplaces support transparent and secure digital asset transactions. However, price volatility, excessive speculation, and uncertainty in asset valuation may hinder the sustainability of the digital economy if they are not properly managed. Therefore, a deeper understanding of value formation mechanisms and the broader economic implications of the NFTs market is necessary to ensure that this innovation can contribute positively to stable and responsible digital economic growth [16, 17].

## 2. LITERATURE REVIEW

### 2.1. Non-Fungible Tokens (NFTs): Concept and Technology

The concept of NFTs refers to digital assets that are unique, non-interchangeable, and whose ownership can be tracked through blockchain technology [18, 19]. The main characteristics of NFTs include uniqueness, indivisibility, and public verifiability (traceability). Beyond these technical attributes, blockchain theory provides a foundational explanation for how NFTs value is formed and sustained [20]. Transparency, enabled by publicly accessible distributed ledgers, allows market participants to observe complete transaction histories, ownership transfers, and price evolution, thereby reducing information asymmetry and enhancing market confidence [21]. Immutability ensures that once NFTs ownership and transaction data are recorded on-chain, they cannot be altered ex post, strengthening the credibility of digital scarcity and reinforcing trust in valuation signals [22, 23]. Decentralization further differentiates NFTs from conventional digital assets by eliminating centralized control over asset issuance and exchange, allowing creators and buyers to interact within a trust-minimized market environment [24]. Collectively, these blockchain properties function as economic mechanisms that shape NFTs price discovery and perceived value. To improve technical clarity, these mechanisms are further specified as distributed ledger transparency, irreversible state transitions, and consensus-validated transaction finality. Framing these features at the protocol and infrastructure level clarifies how NFTs marketplaces operate as blockchain systems rather than abstract digital markets [25]. From a distributed ledger theory perspective, ledger transparency enables continuous public observation of transaction histories and ownership transfers, which reduces information asymmetry and accelerates market reactions to new information [26]. Immutability further reinforces NFTs value formation by ensuring that scarcity claims and historical price records cannot be altered ex post, thereby strengthening credibility and trust in valuation signals. In addition, consensus mechanisms governing transaction validation influence market outcomes by determining transaction finality and confirmation speed, which affect liquidity conditions and traders' responsiveness to price signals [20]. These blockchain-level characteristics provide a theoretical explanation for the high sensitivity of NFTs prices and liquidity to on-chain information flows observed in empirical market data. The technical foundation of NFTs primarily relies on token standards such as ERC-721 and ERC-1155, which allow digital asset representation with varying degrees of flexibility and interoperability [27].

### 2.2. NFTs as Digital Assets

In the context of the digital economy, NFTs are positioned as assets that derive value from a combination of scarcity, creator reputation, utility, and network effects [28]. Scarcity is typically established through blockchain-based token standards that limit the supply of digital assets, while creator reputation reflects the credibility and historical performance of artists or developers within the marketplace. Utility further contributes to NFTs value when digital assets provide functional benefits, such as access to exclusive content, participation in gaming ecosystems, or integration within metaverse environments. In addition, network effects emerge as communities of collectors, creators, and traders interact within NFTs marketplaces, increasing demand and reinforcing the perceived value of specific collections. The literature emphasizes that NFTs valuation models depend not only on intrinsic characteristics but also on market perception and the role of communities in reinforcing value through interaction and recurring demand [29]. In this context, social visibility, community engagement, and platform-level exposure mechanisms can significantly influence how NFTs value is formed and sustained in digital markets.

### 2.3. NFTs Marketplaces

NFTs marketplaces function as the primary infrastructure connecting creators and buyers through transaction mechanisms designed to ensure authentication, liquidity, and security [30]. Market structures are

typically built on business models based on transaction fees, royalty-sharing systems, or creator-oriented approaches. Each platform implements different asset listing, auction, and curation mechanisms, which influence price dynamics and user behavior [31].

From a blockchain-theoretical perspective, these marketplace mechanisms are embedded within decentralized infrastructures governed by smart contracts [32, 33]. Smart contracts operationalize transparency and immutability by automatically enforcing auction rules, royalty distributions, and settlement processes on-chain. This design transforms blockchain properties into practical market functions that directly affect liquidity formation, pricing efficiency, and speculative incentives. As a result, NFTs marketplaces should be conceptualized not only as digital platforms but also as blockchain-based market institutions whose technological architectures shape economic behavior [34].

Applied blockchain literature suggests that these technological architectures directly affect observable market outcomes [35]. Transparent on-chain ledgers allow traders to condition their expectations on real-time transaction data, intensifying short-term price adjustments and speculative behavior. Immutable settlement records constrain post-trade manipulation, yet simultaneously amplify volatility as market participants rapidly respond to irreversible on-chain signals [36, 37]. Furthermore, consensus-based validation processes influence liquidity by affecting transaction throughput and confirmation certainty, thereby shaping trading frequency and market depth. These theoretical mechanisms provide a direct linkage between blockchain infrastructure and the empirical patterns of price volatility and liquidity concentration identified in NFTs marketplaces [38].

As an illustration of how NFTs marketplaces operate in practice, Figure 1 presents the interface of one of the largest NFTs platforms, OpenSea. This interface demonstrates how market information is delivered to users through features such as trending tokens and trending collections, reflecting trading activity, price changes, and levels of market interest over a specific period. Such information presentation highlights the role of marketplaces not only as transaction intermediaries but also as providers of market signals that may influence value perception and economic decision-making.

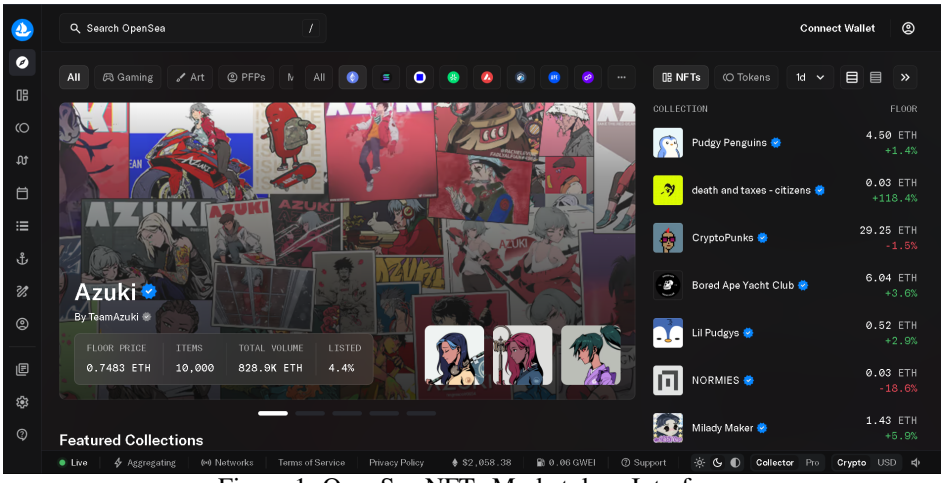


Figure 1. OpenSea NFTs Marketplace Interface
Source: https://opensea.io/discover/chain/ethereum

Figure 1 displays the interface of one of the largest NFTs marketplaces, OpenSea, showcasing lists of trending tokens and trending collections based on price changes, transaction volumes, and market activity over a certain period. The information presented includes collection names, floor prices, percentage price changes, and trend indicators, which directly reflect supply and demand dynamics in the NFTs market. This feature illustrates how marketplaces function not only as transaction venues but also as providers of market signals that influence value perception and user behavior.

Through this interface, it can be observed that curation mechanisms and data visualization implemented by marketplaces play a critical role in shaping liquidity and NFTs price dynamics. Collections categorized as trending tend to receive higher exposure, which in turn may drive increased trading volumes and short-term price fluctuations. This indicates that platform design including ranking systems and market information presentation has a significant influence on the formation of NFTs economic value and on users' purchasing and investment decisions.

### 2.4. Economic Implications of NFTs

The NFTs phenomenon brings broad economic implications, including the emergence of speculative practices and high price volatility that create market risks for investors. In addition, NFTs alter digital consumption patterns by expanding markets for art, music, gaming, and metaverse environments. However, economic risks such as potential asset bubbles, wash trading activities, and information asymmetry between creators, buyers, and platforms also exist [39].

Previous studies suggest that NFTs prices are influenced by visual attributes, creator popularity, and overall cryptocurrency market conditions [40]. Nevertheless, the literature still faces gaps in empirical approaches that consistently explain price formation mechanisms, understand long-term economic impacts on various stakeholders, and evaluate marketplace business models that remain underexplored academically [41].

## 3. RESEARCH METHODS

### 3.1. Research Design

This study employs an empirical quantitative research design to investigate the economic value of NFTs and the market dynamics that occur within NFTs marketplaces. The research relies on quantitative analysis of NFTs price and transaction activity data collected from multiple data sources to examine observable market behavior and identify the key determinants influencing NFTs price formation. By utilizing transaction-based data, this approach enables the study to capture patterns of trading activity, liquidity conditions, and price fluctuations across different NFTs collections over time. Through statistical and econometric analysis, the research aims to provide empirical evidence on how various market factors contribute to NFTs valuation and how marketplace dynamics shape the overall functioning of the NFTs ecosystem [42].

### 3.2. Data Collection

Data collection is conducted using multiple sources that provide historical NFTs transaction information, such as the OpenSea API, NonFungible.com, and CryptoSlam. The collected variables include NFTs prices, trading volume, liquidity levels, creator reputation, rarity scores, and asset categories representing collection characteristics [43]. A specific observation period is established to ensure consistent analysis of price movements and market dynamics. The dataset includes NFTs transactions recorded within a defined observation period, limited to assets with complete price and transaction information, while duplicated records, incomplete entries, and non-tradable assets are excluded during the data cleaning process.

Table 1. Description of Research Variables and Data Sources

| Variable | Description | Measurement | Data Source |
|---|---|---|---|
| NFTs Price | Final transaction price of NFTs | Transaction value in USD | OpenSea API, CryptoSlam |
| Trading Volume | Total NFTs trading volume | Number of transactions per period | NonFungible.com |
| Liquidity | Ease of NFTs trading | Transaction frequency and sales ratio | OpenSea API |
| Creator Reputation | Level of creator reputation | Total sales, number of unique collectors | OpenSea API |
| Rarity Score | Degree of NFTs scarcity | Visual attribute and rarity score | NonFungible.com |
| Asset Category | Type of NFTs asset | Art, collectibles, gaming, metaverse | CryptoSlam |

Table 1 presents the main variables used in this study along with their operational definitions and data sources. The NFTs Price variable represents the economic value of digital assets and is measured based on final transaction prices in USD, enabling comparisons across assets and time periods. Trading Volume reflects market activity levels through the number of transactions per period, while Liquidity represents the ease of trading NFTs measured by transaction frequency and sales ratios.

To capture creator-related effects, Creator Reputation is measured based on total sales and the number of unique collectors as indicators of market trust [44]. Rarity Score represents the level of NFTs scarcity within

a collection based on attribute distributions, which plays an important role in value formation. Meanwhile, Asset Category classifies NFTs into major categories such as digital art, collectibles, gaming, and metaverse, allowing for analysis of price dynamics across asset types [45].

### 3.3. Data Analysis

Data analysis employs statistical and econometric approaches to examine NFTs price dynamics and market behavior. Panel regression is used as the primary model because NFTs markets exhibit cross-sectional heterogeneity across collections and creators as well as temporal variation in prices and trading activity. This approach allows the analysis to control for unobserved asset-specific effects while examining how rarity, creator reputation, liquidity, and asset category influence NFTs prices over time [46]. In addition, Vector Autoregression (VAR) is applied to capture dynamic interdependencies between NFTs prices, trading volume, and broader cryptocurrency market conditions, enabling the identification of short-term feedback effects and market spillovers. Volatility analysis is further employed to examine clustering behavior in NFTs prices, reflecting periods of intensified speculation followed by relative market stability.

The application of these econometric models requires several standard assumptions to ensure valid inference [47]. Panel regression analysis assumes cross-sectional independence, absence of severe multicollinearity among explanatory variables, and well-behaved error terms, which are assessed using correlation analysis and Variance Inflation Factor (VIF) diagnostics. Time-series–based models, including VAR and volatility analysis, require stationarity conditions that are evaluated through unit root tests prior to model estimation [48].

To ensure the robustness and reliability of the results, alternative model specifications and sensitivity analyses are conducted by varying variable definitions, observation periods, and estimation techniques [49]. The consistency of results across different model specifications helps reduce the likelihood that the findings are driven by model-specific bias.

From a practical perspective, the proposed econometric framework can be implemented using on-chain transaction data obtained from blockchain explorers or marketplace APIs. NFTs prices, transaction timestamps, and ownership transfers can be extracted directly from these sources, while liquidity indicators can be constructed from transaction frequency and holding-period duration [50]. These variables can then be organized into panel datasets and analyzed using standard econometric software, allowing the framework to function not only as an academic analytical tool but also as a data-driven system for monitoring market dynamics and speculative behavior in NFTs marketplaces.

### 3.4. Validity and Reliability

Validity and reliability are ensured through data consistency testing and model accuracy verification. Data validity is examined by cross-checking transaction records obtained from multiple sources, including OpenSea API, NonFungible.com, and CryptoSlam, to ensure consistency in price values, timestamps, and transaction metadata. Reliability of the dataset is further supported through data cleaning procedures, including duplicate removal, normalization of price values into USD, and verification of transaction completeness. These steps help ensure that the dataset accurately represents NFT market activity during the observation period. In addition, several statistical diagnostics are conducted to ensure the robustness of the econometric analysis. These include correlation analysis and VIF tests to detect potential multicollinearity among explanatory variables, as well as stationarity tests for time-series variables prior to model estimation. Robustness checks are also performed by comparing alternative model specifications and estimation approaches to confirm the stability and reliability of the empirical results. This process helps strengthen the credibility of the findings and reduces the likelihood that the results are influenced by model-specific bias or data inconsistencies.

## 4. RESULTS AND DISCUSSION

### 4.1. Descriptive Analysis

Descriptive analysis is conducted to provide an overview of NFTs market characteristics during the observation period. The results indicate substantial variability in NFTs prices across collections and asset categories, reflecting the heterogeneous nature of NFTs values. Trading activity is concentrated in categories such as digital art and collectibles, while other categories, including utility or metaverse assets, exhibit relatively lower transaction intensity. Liquidity distribution further shows that most NFTs are traded infrequently, whereas a small number of popular collections dominate overall market volume. The descriptive statistics also reveal a right-skewed price distribution, where a limited number of high-value transactions significantly

increase the market average while the majority of NFTs are traded at lower prices. Similar concentration patterns are observed in trading volume and liquidity, suggesting that market activity is largely driven by highly visible collections and well-established creators. Figure 2 illustrates these descriptive statistics, presenting the distribution of prices, trading volume, and liquidity across NFTs asset categories.

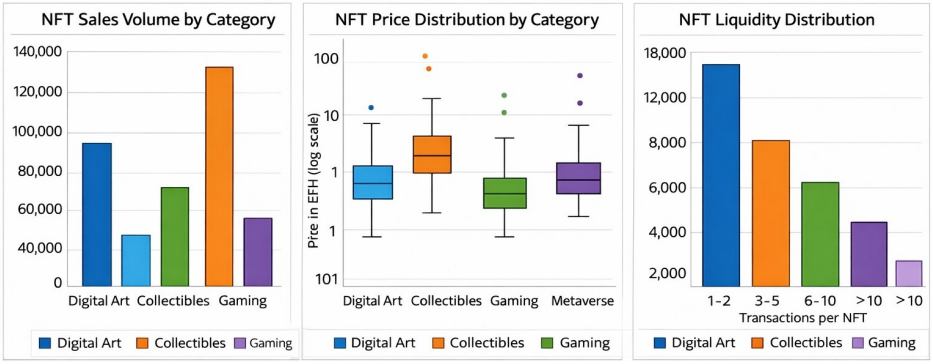


Figure 2. Descriptive Statistics of the NFTs Market by Asset Category, Price, and Liquidity

Based on Figure 2, NFTs trading volume is concentrated in the digital art and collectibles categories, indicating higher levels of trading activity compared to other categories. Price distribution across categories exhibits significant variation, confirming the heterogeneity of NFTs values, where a small number of assets are traded at relatively high prices. In addition, liquidity distribution in Figure 2 shows that the majority of NFTs have low transaction frequency, while only a limited number of collections experience repeated trading and dominate overall market liquidity.

This liquidity concentration can be partly explained by marketplace visibility mechanisms, such as trending lists and featured collections, which systematically increase exposure for a small subset of NFTs. For example, the observed concentration of trading volume in a limited number of highly visible collections suggests that marketplace ranking and featured-list algorithms have a direct impact on liquidity distribution. From a design perspective, platform operators may mitigate excessive liquidity concentration by introducing rotating visibility mechanisms or diversity-based ranking criteria that periodically promote less-traded collections. Such design adjustments can improve overall market participation while reducing extreme liquidity imbalances identified in the descriptive statistics. Assets that appear in trending sections tend to attract higher trading frequency and faster turnover, while less visible NFTs remain illiquid despite similar intrinsic characteristics. This mechanism illustrates how platform-level design choices directly translate descriptive liquidity patterns into uneven market participation.

### 4.2. Determinants of NFTs Prices

Empirical results indicate that NFTs value is shaped by both intrinsic and external factors, which can be interpreted through their blockchain implementations, such as smart contract–defined scarcity rules and on-chain creator identity records. Scarcity (rarity score) shows a positive relationship with price, while creator reputation significantly influences valuation, particularly for creators with consistent sales histories and broad collector bases. These findings suggest that marketplaces may adopt reputation-weighted visibility mechanisms and integrate on-chain reputation metrics into adaptive royalty schemes or access controls, thereby encouraging long-term creator performance and reducing short-term speculative behavior.

These findings show that regression results can inform platform governance and NFTs contract design, particularly through ranking and filtering systems that prioritize high-performing collections. Creators with strong reputations tend to gain greater visibility, increasing liquidity and accelerating price adjustments, although this may also amplify short-term volatility due to rapid market responses. Additionally, community trends and social media sentiment influence price dynamics, while key determinants such as rarity, reputation, and utility can be operationalized as blockchain-native indicators for on-chain analytics to monitor market health and speculative risk.

NFTs marketplaces and blockchain developers can integrate these indicators into real time analytics dashboards to detect abnormal trading behavior, speculative excess, and early signs of bubble formation. Utility driven NFTs further demonstrate that value formation increasingly depends on decentralized application

design, where NFTs function as interoperable components within gaming, metaverse, or service ecosystems rather than merely tradable assets. The findings also offer interdisciplinary contributions to blockchain governance and system design, as determinants such as scarcity, reputation, and utility can be translated into programmable smart contract mechanisms such as fixed supply rules, rarity based distributions, and algorithmic minting constraints to support long term value stability and sustainable market development.

The significance of creator reputation underscores the importance of on-chain reputation systems based on historical transactions and performance metrics, which can be integrated into decentralized governance frameworks to enhance trust and reduce information asymmetry. Rarity, as a key price determinant, may be translated into programmable scarcity mechanisms within smart contracts such as fixed supply rules or algorithmic minting constraints that directly influence perceived value and market stability. Additionally, utility-driven NFTs demonstrate that value formation extends beyond speculation toward functional integration with decentralized applications, gaming ecosystems, and metaverse platforms, reinforcing the role of NFTs as interoperable components within broader blockchain systems rather than standalone digital assets.

These insights also suggest opportunities for the development of on-chain analytics frameworks that monitor rarity distributions, reputation metrics, and usage intensity to support more informed market participation and governance decisions. By translating empirical price determinants into blockchain design and analytics considerations, this study contributes not only to digital asset valuation literature but also to the broader discourse on the design and governance of blockchain-based economic systems. On the other hand, overall cryptocurrency market volatility contributes to NFTs price fluctuations, indicating a strong linkage between the NFTs market and broader crypto market conditions.

These empirical findings are consistent with blockchain theory, which suggests that transparent and immutable on-chain information accelerates market reactions to new signals, thereby amplifying short-term volatility. At the same time, decentralization enables rapid entry and exit of market participants, increasing liquidity but also intensifying speculative trading behavior. Thus, blockchain properties do not merely support NFTs transactions technologically; they actively shape the economic mechanisms through which value is formed, perceived, and redistributed within NFTs marketplaces.

### 4.3. Marketplace Dynamics

NFTs marketplaces shape liquidity and efficiency through blockchain-based infrastructure, where all bids, sales, and ownership transfers are permanently recorded on distributed ledgers. On-chain transparency accelerates price discovery, while smart contracts standardize auctions, enforce royalties, and automate settlement, directly influencing liquidity distribution and short-term volatility. Consequently, NFTs market dynamics reflect blockchain-native market microstructure embedded in listing mechanisms, visibility algorithms, and fee structures. Although immutable records enhance trust and limit post-transaction manipulation, ranking systems, royalty policies, transaction fees, and curated promotion can create liquidity concentration, visibility imbalances, and speculative responses that affect overall value distribution and market stability.

As a concrete example, the observed link between auction-based listings and short-term price volatility suggests that marketplaces aiming to reduce excessive speculation may favor hybrid listing mechanisms that combine fixed-price sales with limited-time auctions. Similarly, the finding that higher royalty rates are associated with lower secondary-market liquidity indicates that platform designers could implement flexible royalty caps or dynamic fee adjustments based on observed trading intensity. These design choices directly translate empirical market dynamics into actionable platform-level decisions.

For instance, auction-based listing mechanisms often generate short-term price volatility by encouraging competitive bidding and speculative participation, particularly during periods of heightened market attention. Conversely, fixed-price listings combined with moderate transaction fees tend to support more stable trading patterns and gradual price discovery. Similarly, higher royalty rates may discourage frequent secondary market trading, reducing liquidity but potentially stabilizing prices by limiting rapid speculative turnover. These examples demonstrate how specific marketplace mechanisms can be directly linked to observed liquidity and volatility patterns in the NFTs market.

### 4.4. Economic Implications

The findings indicate that NFTs have the potential to generate economic value in the digital economy by creating new monetization opportunities for creators in the creative industry. Through blockchain-based ownership verification and smart contract mechanisms, creators can receive direct payments and automated royalties from both primary and secondary market transactions, expanding revenue streams beyond traditional

digital distribution models. However, NFT trading activity is still largely driven by speculative behavior focused on short-term price gains. Rapid price increases that are not supported by fundamental value or practical utility may indicate the risk of speculative bubbles, which could trigger market corrections and reduce investor confidence. Despite these challenges, NFTs remain an important innovation in the digital economy when supported by appropriate regulation, transparency, and the development of sustainable utility.

### 4.5. Comparative Insights

Comparative analysis across NFT marketplaces reveals differences in price formation and liquidity conditions. Platforms with larger user bases and stronger visibility features generally record higher transaction volumes and more stable price spreads, as broader participation improves price discovery. In contrast, marketplaces with lower liquidity tend to experience higher price volatility and greater transaction risks due to limited buyer–seller interactions and shallow market depth. These findings indicate that marketplace design strongly influences market outcomes. Factors such as visibility algorithms, listing mechanisms, transaction fees, and governance policies shape liquidity distribution and trading behavior, while transparent information systems can support better decision-making and more efficient price discovery in NFT markets.

## 5. MANAGERIAL IMPLICATIONS

The study offers managerial implications framed through blockchain system design, smart contract configurations, and on-chain governance mechanisms. Marketplace operators can embed decentralized rules within smart contracts to enhance transparency and accountability, including public disclosure of transaction histories, fee structures, and ranking criteria. Governance tools based on verifiable on-chain metrics such as liquidity and abnormal trading patterns can trigger automated policy adjustments, while wash trading detection, user verification, and anomaly monitoring improve market integrity. Additionally, incentive schemes linked to real NFTs utilization and community engagement can foster more sustainable liquidity and reduce speculative distortions.

For creators, the findings emphasize the importance of long-term value creation through branding strategies and clear NFTs utility design, operationalized via smart contract–based royalty and incentive mechanisms. Programmable royalty rules ensure automatic and immutable revenue distribution across primary and secondary markets, aligning incentives with sustained participation rather than short-term speculation. Creators can also embed usage-based or access-related utilities directly into NFTs smart contracts such as token-gated content, dynamic benefits, membership rights, or gaming and metaverse functionalities thereby tying NFTs value to verifiable on-chain functionality. These blockchain-native design features enable creators to build durable reputations through transparent transaction histories, consistent project quality, and active community engagement, ultimately reducing reliance on purely speculative price dynamics.

From investor and policy perspectives, the findings emphasize risk-based decision-making and adaptive regulation that leverages blockchain transparency without compromising decentralization. Investors should evaluate creator reputation, scarcity, utility, and liquidity using on-chain data while managing volatility through diversification and monitoring broader crypto-market trends. Regulators can utilize immutable blockchain records to monitor manipulation and abnormal trading in real time, while standardized smart contract templates and blockchain-native governance protocols embed compliance directly into marketplace infrastructure, reducing enforcement costs and enhancing accountability while supporting balanced innovation and market stability.

## 6. CONCLUSION

This study demonstrates that NFTs marketplaces play a central role in shaping the economic value of unique digital assets through transaction mechanisms, liquidity provision, and visibility systems that influence market perception and participant behavior. The analysis indicates that NFTs price dynamics are not solely determined by intrinsic asset characteristics, such as scarcity and creator reputation, but are also influenced by external factors, including community trends, utility within digital ecosystems, and overall cryptocurrency market volatility. Accordingly, NFTs marketplaces function not merely as trading intermediaries but as active actors shaping market structure and dynamics.

Based on these findings, this study answers the research questions by affirming that NFTs economic value is formed through interactions between smart contracts–enabled marketplace mechanisms, asset characteristics, and market microstructure dynamics. Factors such as scarcity, creator reputation, and utility play important roles in price determination, while the economic implications of NFTs market development are ambivalent. On one hand, NFTs create new economic value opportunities for creators and support digital economic growth; on the other hand, high levels of speculation and price volatility indicate potential asset bubble risks that require careful management. The theoretical contribution of this research lies in enriching the digital economics literature through a more structured understanding of NFTs value formation mechanisms, while its practical contribution provides guidance for creators, investors, and marketplace operators in making strategic decisions.

Nevertheless, this study has several limitations, including limited historical data for certain periods and a focus on dominant marketplaces and NFTs categories, which may not fully represent the continuously evolving NFTs ecosystem. In addition, user behavior factors and cross-country regulatory influences were not analyzed in depth. Therefore, future research is encouraged to expand data coverage, integrate behavioral and institutional approaches, and explore the long-term impacts of NFTs on market stability and digital economic sustainability.

## 7. DECLARATIONS

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### 7.2. Author Contributions

Conceptualization: SE, SS, and MN; Methodology: MP; Software: MR; Validation: MN and MP; Formal Analysis: SE and SS; Investigation: MR; Resources: MR; Data Curation: SE; Writing Original Draft Preparation: MN and MP; Writing Review and Editing: SS; Visualization: MR; All authors, SE, SS, MN, MP and MR, have read and agreed to the published version of the manuscript.

### 7.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

### 7.4. Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

### 7.5. Declaration of Conflicting Interest

The authors declare that they have no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the work reported in this paper.

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