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Tokenization of Works of Art as a New Investment Model

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Abstract: *Investments in art, a category of alternative investments, are invariably of great interest to investors, and the value of the art market is growing every year. However, there are a number of barriers limiting the development of this market. The emergence of a new investment model " tokenization of works of art is a chance for their partial overcoming. The existence of the model is possible due to the use of blockchain technology and smart contracts for the process of issuing digital tokens. The digital token confirms ownership of the fractional part of the work of art that can be traded on the cryptocurrency market. This translates into the prospect of wider access of potential investors to this type of assets and significantly increases the investment liquidity. The purpose of the article is to identify and evaluate a new investment model on the art market " tokenization of works of art. The article is an attempt to answer the questions: (i) what benefits result from the use of the new investment model for art market participants, (ii) what conditions must be met for the model to become an available form of investing capital.*

JEL: *G15, G20, O16.*

Keywords: *blockchain, tokenization, works of art, alternative investments, digital tokens.*

1. INTRODUCTION

As a result of the turmoil in the financial markets, new ways of increasing capital, classified as alternative investments, are gaining popularity. Works of art have a significant share in these investments. The art market is currently worth 67.4 billion dollars and its value is growing every year (*The Art Market Report* 2019). Investors see the possibility of achieving many goals: achieving high rates of return, risk management through diversification of the investment portfolio, but also achieving non-financial goals.

The use of blockchain technology and smart contracts to issue digital tokens has opened completely new investment opportunities on the art market. The token represents the ownership of the fractional part of the work and can be traded on the stock exchange where it is listed. Due to restrictions resulting from traditional trade in works of art, entities operating on this market indicate the need for a new investment model. And it is tokenization that is to be the answer to these needs. The tokenization process of works of art is seen as the possibility of removing significant barriers on the market in question, which is expected to contribute to its development. Currently, tokenization is at an early stage, both in technology and implementation on the market, hence the distrust of art owners and investors of this model. However, there is a growing interest in this form of investment. This is manifested, for example, in the creation of platforms that offer fractional ownership and tokenization. In 2018, the Maecenas investment platform tokenized the world's first work of art. In the context of raising capital and investments in financial markets, the tokenization of works of art is still rarely described in the industry literature.

The purpose of the article is to identify and evaluate a new investment model which is tokenization of works of art. For this purpose, the following research questions were posed:

(i) what are the benefits of using the new investment model for art market participants,

(ii) what conditions must be met for the tokenization of works of art to become an available form of investing capital.

To achieve the goal, a method of critical analysis of literature, source materials and descriptive method was used. In addition, the article analyzes the latest reports on the researched market and websites of entities related to the world art market.

The article is empirical. The first part of the article defines the concept of alternative investments, characterizes the features of the investment art market and factors affecting the prices of this class of assets. Then the world investment market for works of art was presented. The next chapter focuses on explaining the concept of a digital token, its types and application. Chapter five describes the investment model of tokenization of works of art. In the next part, this model was assessed by indicating the benefits of using the model for both investors and owners of works of art. The article closes with a summary indicating the conditions that may contribute to or limit the development of the discussed investment model on the global art market.

2. WORKS OF ART AS ALTERNATIVE INVESTMENTS

The concept of alternative investments in the literature is not clearly defined. Individual authors define this concept taking into account various factors. Some of them specify alternative investments, listing the classes of assets that they believe belong to these investments (Kennedy 2010, Schulaka 2009, Sigiel 2008). Alternative investments are sometimes defined as those that do not belong to traditional investments, but their clear division remains a matter of dispute. Traditional investments include shares and bonds as well as investment fund units (Aspadarec 2013, p. 10). The method of division between "traditional" and "alternative" investments is closely related to the investor's knowledge and experience in allocating assets on financial markets (Borowski 2012). Pe³ka (2009) defines alternative investments as "a wide range of financial products and services that do not belong to traditional forms of investment, such as shares, bonds or classic investment funds. It is an investment category, separated due to specific features, covering various classes of assets. This group includes *hedge* funds, structured products, *private equity*, managed accounts, real estate, raw materials and the new generation of derivatives". A similar position is taken by Manning (2019), according to which alternative investments do not belong to typical asset classes, such as shares, bonds and cash. In addition, the concept of alternative investments is a universal concept under which a number of investment products can be classified: hedge funds, private equity funds, raw materials, real estate, derivatives, art and antiques, intellectual property.

According to some authors, alternative investments should be understood as investments in physically existing assets whose rate of return is uncorrelated with the financial market and includes: real estate, precious stones and metals, works of art, alcohol (e.g. wine, whiskey), luxury goods (e.g. yachts, watches), raw materials and goods, decorative materials of natural origin (e.g. amber), collections (e.g. stamps, coins, feathers, old books, furniture), comics, national souvenirs (Banasik 2016, p. 110-113).

As previously noted, alternative investments are a wide range of products for which the following features should be analyzed (Boido, Fasano, 2009, p.75):

— low correlation with traditional financial investments such as shares,
— possible relatively low liquidity,
— potential difficulty in determining the current market value of a given group of assets,
— limited data on risk and rates of return,
— necessary to make an analysis before investing,
— possession of specialist knowledge.

Given the diverse nature of alternative investments, there are many reasons why investors are interested in them. Probably the most important are that they allow diversification and thus reduce portfolio risk. They can also generate higher rates of return than just a traditional portfolio (Manning 2019). Alternative assets have become as important as equities and fixed income in the portfolios of major investors, and so their diversification properties are also important (Platanakis, Sakkas, Sutcliffe, 2019). Some authors emphasize that the alternative investment market develops only in times of crisis, while in times of economic development they are not an attractive form of capital increase (Weber 2011).

It is worth mentioning that in the case of alternative investments, the low correlation coefficient of returns of this class of assets with the rates of return on shares and bonds and the low value of the standard deviation of rates of return is of key importance. "These features enable the creation of more efficient investment portfolios, which include, in addition to shares and bonds, also alternative investments. In this case, more effective is understood as portfolios which, according to modern portfolio theory, allow investors to obtain a higher rate of return with the same or lower risk that would be achievable from a portfolio built only from shares and bonds" (Borowski 2016, p. 9-10). Other features that distinguish alternative investments from other forms of capital investment include maximizing the rate of return in the absolute sense (rather than against a specific pattern, the so-called benchmark), the negative correlation of rates of return with the profitability of traditional investments, the existence of so-called entry barriers (i.e. the requirement to have a specific minimum amount to complete the chosen alternative investment) and the so-called entry limits (limited number of potential buyers) (Soko³owska 2010, p. 56).

The art market, which, as previously indicated, is a segment of the alternative investment market. It should be added that works of art belong to the subcategory of alternative investments, called emotional investments. Emotional investments are those that, in addition to the benefits of portfolio diversification and creating economic value, allow investors to achieve non-economic benefits. So there is a certain group of investors for whom emotional factors are as important as economic. Along with the enrichment of the society, it can be seen that the motivation for undertaking the investment is not only a safe investment of capital and multiplication of property, but also prestige, aesthetic experience or the desire to have a unique item. As many as 94% of investors indicate the emotional factor as one of the motives for buying works of art. 59% of them are motivated by the expected return on investment (*Hiscox Online Art Trade Report* 2019). A specific group are also collectors whose goal of buying good is the desire to own or create a collection. In this case, the collector's items may go back to the market in specific cases: the collector's financial problems when he is forced to sell due to debts; when there is a division of property as a result of divorce and at the time of the collector's death (Wieprow 2018, p. 350).

Works of art, as part of alternative investments, have their features, such as low liquidity (sometimes extremely low liquidity), lack of standardized valuation methods or limited data on risk and return rates. However, due to the specifics, there are several factors to consider when deciding to invest in works of art. First of all, these are physically existing assets, therefore the costs of their storage and possible insurance should be taken into account. There may also be legal regulations on the art market that restrict the free flow of goods between countries. They are treated rather as long-term investments, with an investment horizon of 5-7 years. In addition, which is very characteristic of this market, there are fashions. This can significantly affect periodic fluctuations in the demand of individual segments of the art market.

Research and simulation results indicate that the inclusion in the portfolio of assets from the group of works of art reduces risk and increases the overall rate of return. Analyzes of industry specialists boil down to two key conclusions: art – as a component of the portfolio resistant to inflation – increases security in times of economic instability, while the historically confirmed low correlation of the art market with shares and bonds translates into an improvement in the ratio of return to risk in a given portfolio. Classical portfolio theory recommends allocating 3–10% per unit, given the history of low correlation of this asset class with other assets and high returns, depending on the investor risk profile (*Art Vantage PCC Limited*).

The art market is the largest segment of the alternative investment market, the subject of which are paintings, sculptures, graphics, posters, porcelain, antiques and applied art, and the price of the work is not dominated only by the ratio of demand to supply (Cichorska 2015, p. 71). Many factors influence the price of this asset class. These are factors related to the physical properties of the work, its creator, origin or uniqueness. The specific features of the art market (e.g. the existence of investors not only for profit) and factors related to its macroeconomic environment also have a significant impact on price. Table 1 presents the factors affecting the price of works of art.

Noteworthy is the issue of correlation of works of art with the S&P500 index. Interestingly, various subcategories of works of art show a different correlation in relation to the S&P500 in the long run. Low correlation is shown in the works from the "European Old Masters" and "Global Impressionist Art" categories. On the other hand, works from the "Global Post-War Art" category have significant dependence on the S&P500 index.

Table 1: Factors affecting the prices of works of art

Factors shaping prices for works of art	*Characteristics*
Physical properties of the work	– Content of the work, artistic value. – Author (artist's fame, creative reputation and popularity). – Technique of execution. – Condition. – Origin, age of the work, historical value. – Uniqueness.
Behavioral	– Fashion for works of art from a specific period or a given artist Willingness to pursue passion. – Achieving non-financial benefits, aesthetic experiences, prestige.
Economic	– Level of wealth of a given country. – Tendency to invest in art. – Condition of the economy, GDP per capita. – Economic knowledge, including alternative investment opportunities. – The country's tax system.
Technological	– Level of Digitization of Society. – Access to the Internet (source of knowledge). – Development of blockchain technology.
Legal	– Legal conditions related to trade in works of art. – Legal regulations restricting the export of works of art from a given country.

Source: own study.

and "Global Contemporary" (*Art & Finance Report 2019*). Table 2 shows the value of the correlation coefficient between specific art subcategories and the S&P500 index.

Table 2. Correlation between individual art categories and the S&P500 index

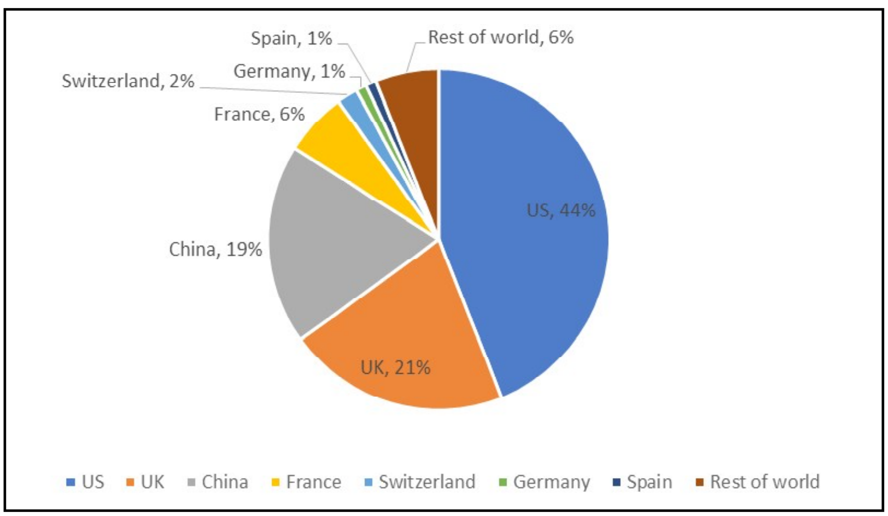
Art category	*Correlation between individual art categories and S&P500*
European Old Masters	0.29
Global Impressionist Art	0.27
Global Modern Art	0.54
Global Post-War Art	0.74
Global Contemporary	0.73
Fine Chinese Paintings and Calligraphy	0.65
Chinese 20th Century & Contemporary	0.65

Source: own study based on *Art & Finance Report* 2019, 6-th edition, p. 139.

3. THE WORLD ART MARKET

According to The Art Market Report (2019, p.16), sales on the global art market in 2018 amounted to 67.4 billion USD and increased by 6% compared to 2017. In 2018, the number of transactions reached the highest level since 2008 and amounted to 39.8 million. 84% of the value of the art market is concentrated in three countries: USA, UK and China. In 2018, as in 2017, the dominance of the three largest art markets can be seen: the USA, Great Britain and China. Their total sales accounted for 84% of the total value of the global art market. In 2018, art sales in the US reached a record level of 29.9 billion dollars which accounted for 44% of the world art market. In the same year, transactions in the amount of USD 14 billion were carried out in Great Britain, which made up 21% of the global market. China has a 19% stake with a transaction value of 12.9 billion dollars. The share of individual countries in terms of the value of sales of works of art is presented in Chart 1.

Chart 1. Global Art Market Share by Value in 2018



Source: own study based on *The Art Market Report* (2019), An Art Basel & UBS Report, Founder of Art Economics, p. 36.

Research on the art market and analytical instruments created in recent years support investors' decision-making processes. They also show the relationships and differences between investments in traditional financial and alternative instruments. They mainly concern global trends and major players in the global market. Mei Moses Art Indices is the best known index on the art market, most often used to compare the results of the art market with other categories of assets. As the only one in the world, the index also examines the correlation between the art and financial markets. It compares the rates of return on investment in works of art and the rates of return of S&P500. The two basic parameters used to compare the results of the art and action sphere are risk and the average annual rate of return. The most frequently cited rate of return on investment in works of art has its source in the results of the study published by Mei Moses, created on the basis of repeat sales methodology (based on recorded cases of re-sale of specific objects). Based on around 60,000 re-sales from 1810 to present, Mei Moses Indices from Sotheby can be used to compare the results of subcategories of art, identify trends and internal market dynamics, and understand market links with broader economic and social factors. The methodology is based on the Case-Shiller Real Estate Index. In the years 1950-2018, the Mei Moses Index, for the entire art market, had an upward trend, reaching CAGR (*Compoud Annual Growth Rate*) of 8.8% (*https://www.sothebys.com/en/the-sothebys-mei-moses-indices).*

The next index on the art market is the Artnet Index, created by the Artnet platform, which offers a database of art auctions around the world (12 million auctions). The Arnet Index built on a financial model, such as the S&P500, aggregates data from conducted auctions, which are included in the database *(https://www.artnet.com/price-database/).*

Research conducted by Deloitte Luxemburg and ArtTactic (2019) shows that in the period 2000-2018 Artnet's Index for the Top 100 Artists produced an 8% CAGR, compared with 3% for the S&P 500. Importantly, investors perceive art as assets, which retain their value in the long run compared to other financial instruments *(Art & Finance Report 2019*, 6-th Edition).

Table 3: CAGR level for individual art categories (2013-2018)

Art category	*5-year CAGR*	*10-year CAGR*	*15-year CAGR*
European Old Masters	-2.82%	-1.63%	2.38%
Global Impressionist Art	-3.92%	-0.48%	1.33%
Global Modern Art	2.87%	2.10%	4.15%
Global Post War Art	7.92%	6.69%	7.81%
Global Contemporary	5.70%	4.58%	7.12%
Fine Chinese Paintings and Calligraphy	-5.06%	7.45%	9.31%
Chinese 20th Century& Contemporary	-1.15%	5.13%	9.31%

Source: own study based on *Art & Finance Report* 2019, 6-th edition, p. 135.

The following art investment models can be identified on the art market:

— via auction houses, art galleries,
— by purchasing investment fund units investing capital in works of art,
— through investment platforms offering purchase of shares in works of art,
— by issuing and selling digital tokens on investment platforms, based on blockchain technology.

The most commonly used model for investing in art is brokering auction houses and art galleries (stationary sales and online auctions). 70% of global auction sales (from July 2018 to July 2019) took place in three auction houses: Sotheby's (32.9%) Christie's (25.4%), Phillips (11.9%), (*The Contemporary ArtMarket*, Report 2019, p. 18). Importantly, the value of online sales is increasing every year, which in 2018 accounted for 9% of the value of global art sales. The estimated value of the online market is 6 billion dollars, which means an increase by 11% compared to 2017 (*Art Market Report 2019*, p. 258).

Acquisition of investment fund units in art is another form of investment in art. These are mainly private investment funds, intended to generate profits by purchasing and selling works of art. They are managed by a professional management company or consulting company that receives a management fee and a share of the fund's profits. Funds investing in art differ in terms of total size, duration, investment focus, investment strategies and portfolio constraints. One example of a fund that invests in art that has achieved financial success is the Artemundi Global Fund, which operated in the years 2010-2015. The entity collected 211 million dollars from investors. The average purchase price for the work was over 800 thousand dollars. The fund's investments were customized to the 5-year horizon, and the average annual rate of return was 17.07% (*Artemundi Global Funds was active from 2010-2015*).

Another example of a fund that bases its asset portfolio on art is registered in Gibraltar Tiroche DeLeon Collection Art Vantage. At the time of opening the subscription (2017), the fund required a minimum amount of 500 thousand dollars, and additional costs are 2% of the annual fee for fund management, and 20% of commission on profit (*http://www.tirochedeleon.com/about/investors*).

The Fine Art Group runs several funds investing in art. Other operating funds of this type are the Swiss Fine Art Invest Fund (https://privateartinvestor.com/category/art-finance/art-funds-art-finance), the German Artfonds 21 (*http://artfonds-21.com*) or the South African The Scheryn Art Collection Fund *(http://scheryn.com).*

In recent years, the investment model in the art market is gaining popularity, based on the sale of shares representing the fractional ownership of the work. The activity of platforms using this model involves the acquisition of a work of art and then providing investors with the opportunity to purchase a fraction of the work. The first company to use this model is Masterworks founded in 2017. The platform, using its capital, purchases the works of selected artists (Monet, Warhol), then submits an offer to the Securities and Exchange Commission (SEC) to offer it publicly. The next stage is making the offer available to investors who purchase a fraction of the work. After a certain time, Masterworks sells the work, dividing the income according to the shares held *(https://www.masterworks.io/about/about-masterworks).*

Another example is one of the latest Artopolie platforms, which was established in 2019. Artopolie's offer includes works by Pablo Picasso and Claude Monet. The holder of the fractional part of the work can be any registered participant in the platform. Artopolie acquires the work and submits an offer to the Securities and Exchange Commission (SEC). After accepting the offer, Artopolie sells fractional ownership of the work on its platform. The value of the share can be bought for just 50 dollars. (*Artopolie, A New Asset Class Set to Revolutionize the Way People Invest in Art*).

The last of these forms of investing in art is a new model, which is tokenization. Thanks to this process, it is possible to purchase tokens confirming ownership of a fractional part of the work, and then trade it on the cryptocurrency exchange. However, before this model is characterized, it is necessary to explain what the token is and what its emission is all about.

4. ISSUE OF TOKENS

Due to the development of decentralized blockchain technology, next to cryptocurrency creation, the possibility of issuing tokens has appeared. Tokens have no material dimension, are a digital record based on blockchain technology and exist thanks to smart contracts. A smart contract is a program or application that automates the performance of a digital contract that is enforced by a specific set of rules, without human intervention. These rules are predefined by computer code, which is replicated and executed by all nodes operating in a given network. Currently, the most tokens are created on the Ethereum platform, and more specifically in the ERC20 standard. Thanks to these types of standards, individual applications, e.g. exchanges, do not have to adapt to the new token each time. There is a cryptocurrency called Ether in the

Ethereum protocol, you can create in it an unlimited number of different tokens. A token is a digital unit of value that an organization creates to independently manage its business model and enable users to interact with their products, while facilitating the distribution and exchange of rewards and benefits to everyone involved (Mougayar, 2016).

Tokens have many applications. They can perform a utility, marketing, settlement or investment role. Depending on the purpose, they are used for settlements for access to specific resources of IT systems, they are a tool to raise funds for starting a business and developing a company (including a startup) or a specific project, they reflect the state of ownership of shares in the company, they work as a marketing tool. According to the classification adopted by the US SEC (United States Securities and Exchange Commission) and the Swiss FINMA (The Swiss Financial Market Supervisory Authority), tokens can be divided into two main categories (*The Ulitamate Guide to STO* 2019, p. 11):

— utility tokens – this category of tokens gives their owners access to services performed by a given project;

— security tokens – they are instruments analogous to securities and reflect their ownership.

A token represents an asset or utility that a company has and they usually give it away to their investors during a public sale called initial coin offering (ICO). ICOs are basically crowd sales, the cryptocurrency version of crowdfunding (*Hiscox Online Art Trade Report* 2019, p. 26). ICO is a tool used to distribute utility tokens. It is a process in which, through the sale of tokens, financial resources are collected for the needs of launching an investment project. In the years 2017-2018 there was a sharp increase in the popularity of ICO, however, as a result of numerous irregularities, frauds and deterioration of the overall situation on the crypto market, the value of the ICO market has significantly decreased (Inwara 2019). ICO's low credibility, high risk and problems related to legal regulations have led to the development of a new financing method – STO (Security Token Offering). STO offers secured tokens that have the features of securities and are subject to legal regulations and meet all the requirements associated with them. Therefore, it is a much safer method of financing, due to the obligation to issue asset tokens in the blockchain network, as part of legal requirements on the prospectus, thus allowing tokens buyers to have shares in a real enterprise. A crypto token that passes the Howey Test is deemed a security token - a test created by the US Supreme Court for determining whether certain transactions qualify as investment contracts (*The Ultimate Guide to Security Tokens Offering*, p. 12).

Secured tokens represent assets such as participation in real underlying instruments, companies or profit streams, and the right to dividends or interest payments. In terms of economic function, tokens are analogous to shares, bonds or derivatives (*Types of tokens. The four mistakes beginner crypto-investors make*). Secured tokens are those that provide buyers (investors) with fractional ownership of the underlying (e.g. works of art, real estate, business assets), acquired to generate profit for their holders (*Security Token Offering: what, where and how*, p. 5).

5. TOKENIZATION OF WORKS OF ART AS A NEW INVESTMENT MODEL ON THE FINANCIAL MARKET

The introduction of blockchain technology into the world of finance has many positive effects. First of all, it allows you to limit the number of intermediaries. Thanks to the blockchain technology, it is possible to shorten the time of completing the transaction. Another advantage is that different asset classes can be offered on the global market. Virtually anyone who has access to the Internet can, under applicable law, participate in an emerging investment opportunity, regardless of where they are. In addition, investment projects may be of interest to more investors, as their offer will reach a wider group. It is also worth emphasizing that blockchain technology definitely limits the possibilities of market manipulation, because each transaction is recorded in a transparent manner in real time, not allowing any subsequent changes, and information about it is made available at all times to all interested parties, including supervisory authorities (Schueffler, 2019).

Blockchain technology can be used on the art market to identify a work, to avoid fraud, and to issue tokens. An example of using blockchain technology in the process of confirming the authenticity of works of art is the solution used by the Dutch company V-ID. Thanks to the developed technology, it was possible to create a digital record of the smallest details of Rembrandt's work. The painting "Mother of God with the child in the clouds", in the form of specialized photographs, was contained in one authentication file, and then saved on four different blockchains. The recipient of the file is able to check the authenticity of the work within 5 seconds. (*First Blockchain Validated Rembrandt*).

Tokenization is one of the possibilities of using blockchain technology. Tokenization is a process in which a certain form of resources is converted into a token that can be moved, stored or registered in the blockchain system. In other words, tokenization is the process of transferring asset rights to a digital token. In this way, physical resources, such as works of art, can be transferred to the digital blockchain system, where they will be registered and sold. All operations in it are performed in an encrypted form and entered into blockchain blocks. This ensures the transaction is secure and cannot be counterfeited or modified. (Burke et al., 2019) Tokenization allows therefore to participate in the ownership of assets, without having to physically divide it into parts. The Deloitte report (2019) highlights the potential of tokenization as a new form of investment in art. Fractional ownership (token) gives smaller investors the opportunity to have a share of a work of art. Digital tokens, through crowdfunding, can also be used to finance artistic projects, creators, in whole or in part. In addition, as research indicates, entities involved in the art market believe that technological development can have a significant impact on the turnover in this market. 76% Wealth Managers, 75% Collectors and 76% Art Professionals claim that technology contributes to greater transparency in the work of art (*Art & Finace Report 2019* - 6-th Edition).

The tokenization process consists of several stages. After the valuation, verification and confirmation of the authenticity of the work of art, the purchase offer is issued on the investment platform. Investors, before making a decision, can learn about the details of the work, its history, origin, creator. Then, using blockchain technology, tokens are issued representing the percentage share of ownership of the work. The owner issues tokens for sale on the platform, investors buying tokens can pay for them with any acceptable fiduciary or cryptocurrency currency. Trading tokens is possible on the cryptocurrency exchange on which they are listed (*https://www.maecenas.co/whats-maecenas/*). Thus, in the investment model of tokenization of works of art, digital tokens are traded, which represent the percentage share of ownership in a given work of art. The tokens are distributed via the investment platform.

The first tokenization of the work of art in the world was made on the Maecenas investment platform. In 2018, the artwork of the late American artist Andy Worhol, worth 5.6 million dollars was sold (in part) using the tokenization process. Over 800 people entered the auction, buying tokens for approximately 1.7 million dollars, representing 31.5% of the value of the work (*Maecenas successfully tokenises first multi-million dollar artwork on the blockchain*). Currently, the MaecenasArt token is listed on cryptocurrency exchanges, including:

— CoinMarketCap,

— Etherscan,

— CoinGecko.

The highest value of the MaecenasArt token reached Jan 10, 2018 (2.58 USD), the lowest – Nov 20, 2020, (0.000405 USD), *(https://coinmarketcap.com/currencies/maecenas/markets/).*

Another example of an investment platform using blockchain technology is the Look Latereal created in 2018. The platform is available to anyone who wants to invest in the art market by buying and selling shares in works of art. Through Look Lateral, it is possible to authenticate and secure permanent collections, e.g. museum collections, and raise capital by creators for various artistic projects *(https://www.looklateral.com/).*

6. BENEFITS OF USING NEW INVESTING MODEL

The increase in the number of transactions and the growing interest in the art market in recent years shows that investors see the investment potential of this asset class. However, it should be emphasized that there are many barriers to the development of the art market. Some of them result from the very specificity of works of art, such as difficulties in estimating the value, costs resulting from the need to store and secure the work or the variability of buyers' tastes, which generates high risk with this type of investment. An important barrier to the development of the art market is the need to incur high expenditure, which also translates into investment liquidity. In 2017, the work of Leonardo da Vinci "Salvator Mundi" was sold at Christie's auction house for 450 million dollars. (*Leonardo's Salvator Mundi makes auction history*). This is a price record of all time, which, however, shows how extremely low a liquidity a work of art can have. To sell the image, a buyer would have to be found who would be able to pay such a high price. Works of recognized artists, e.g. "Old masters", which constitute an attractive capital investment, are characterized by a high price and low liquidity. As Art Bazel and UBS research shows, 61% of total art sales in the art auction market in 2018 were works sold at prices exceeding 1 million dollars. (*The Art Market Report 2019*). The high entry threshold is undoubtedly one of the most significant disadvantages of investing in these assets. In addition, they are long-term investments, associated with the need to incur additional costs of storage and protection of the work. There are also geographical restrictions, which translates into lower availability for investors. Trade in works of art is largely done through brokers (auction houses, art galleries), which involves paying high commissions.

Tokenization of works of art can significantly affect the abolition of these barriers. Through tokenization, the owner can raise capital by selling part of the work that he still physically owns. From the investor's point of view, the benefits of tokenization are as follows:

— possibility of purchasing a fractional part of the work,
— possibility to diversify the investment portfolio,
— high liquidity of investments,
— trading tokens on the stock exchange,
— high transparency and security of transactions,
— no costs of securing and storing the work,
— no geographical restrictions,
— influence the choice of work.

The option of purchasing a fraction of a work (token) significantly reduces the entry threshold and increases investment liquidity. The token can be sold at any time. In addition, the access of potential investors to the token distribution platform is much wider than in the case of traditional trade in works of art. There are also no time limits, access is 24 hours a day. Thanks to tokenization, the work can physically remain in the possession of the owner, which makes it available to the public (e.g. in a museum). In the case of investment funds, a high barrier to investment is also a significant barrier. For example, the Tiroche DeLeon Collection Art Vantage Fund, a private fund, required a minimum amount of 500 thousand dollars at the time of opening the subscription (2017), additional costs: 2% of the annual fee for fund management, and 20% commission *(http://www.tirochedeleon.com/about/investors/).*

In addition, the funds make their own decisions regarding the choice of the collection, the investor has no influence on the choice of work. Table 4 summarizes and characterizes the criteria for selecting investment in works of art, for the traditional model (art galleries, auction houses, investment funds) and for the tokenization model of works of art.

7. NEW MODEL DEVELOPMENT CONDITIONS

As it results from the above analysis, tokenization may significantly lift the barriers limiting the development of investments on the art market. The issuance of secured tokens, by eliminating the features of a traditional model, introduces investments in art on completely new tracks. However, tokenization as an innovative model, in the initial phase of operation, is met with a lack of confidence of both owners who want to raise capital in this way, and investors. Only 19% of collectors and art professionals are interested in fractional ownership investment models. For comparison, 33% of collectors and 38% of art professionals have said the same about traditional art funds. Wealth managers are also not convinced by the fractional ownership investment model. Only 10% of them consider

Table 4: Investments in works of art in the traditional and tokenization models

	Art Auction Houses/ Art Galleries	*Fine Art Investment Funds*	*Tokenization*
Entry threshold	High /very high.	High.	Low.
Investment liquidity	Low.	Low/medium.	High.
Fees/commissions	Art Auction Houses– up to 25%. Art Galleries – up to 50%.	2% annual fee + 20% on profits.	1-8%.
Additional costs (insurance, storage, security)	Yes.	No.	No.
Impact on the choice of work	Yes.	No.	Yes.
Time limits	At set opening hours.	During the fund's operation.	24 hours a day.
Access for investors	Local.	Global.	Global.
Easy and quick transaction	No.	No.	Yes.
Porfolio generation	No.	Yes.	Yes.

Source: own study based on https://www.maecenas.co/whats-maecenas/.

recommending this model to their clients. In contrast, ArtTactic research has shown that as many as 46% of investors from the age group up to 35 years of age are considering fractional ownership as a form of investment. For comparison, 29% of buyers, many over the age of 50, are interested in this model of investment in art. It should also be emphasized that only 4% of investors are interested in investing in tokens listed on cryptocurrency exchanges (*Hiscox Online Art Trade Report* 2019). One of the factors constituting a barrier in the development of the model is the problem of cyber security. Research shows that 42% of art galleries trading on the internet have been targeted by cybercriminals in the last 12 months. In contrast, 47% of them are concerned or very concerned about cybercrime. In the case of online art buyers, as many as 57% are worried about paying by credit card, 47% are afraid of data loss and 40% are worried about the course of the purchase of a work of art through the online platform (*Hiscox Online Art Trade Report 2019*).

Lack of trust may also be associated with threats related to blockchain technology itself and the overall situation on cryptocurrency exchanges. The source of risk here is primarily the instability of these exchanges and their high volatility. As history has shown, the attacks of hackers, which destabilized the blockchain ecosystem and negatively affected investor sentiment, is also a significant factor here. In addition, the limited trust of art market participants is associated with the problem of "money laundering". 76% of wealth managers believe this is a key problem (*Art & Finace Report* 2019, p. 202). The introduction of legal regulations regarding EU member states may have an impact on limiting this practice. The changes are related to the introduction of AML Directive V on the prevention of the use of the financial system for money laundering or terrorist financing. Under the provisions of the AML V Directive, attention has been paid to entities dealing in the provision of currency exchange services between virtual and fiat currencies, as well as to providers of virtual currency accounts, which were not previously obliged under EU law to identify suspicious activities (*Directive EU 2018 / 843 of the European Parliament and of the Council of 30 May 2018*).

Another problem is related to the Security Tokens Offering market. Security tokens have features of securities, however, legal regulations and rules regarding the issue of these tokens have not been regulated in all countries. Many countries adapt laws to the changing market requirements, development and use of the possibilities of blockchain technology. However, there are countries where trading in secured tokens is still banned, e.g. China, South Korea, Ecuador, Algeria (*The Ultimate Guide to Security Token Offerings 2019, p. 27*).

Tokenization, as a new investment model on the art market, can significantly affect the interest in investing in this class of assets, although the risk arising from the exposed threats should be considered. The most important of them include legal restrictions and the stability and development of cryptocurrency exchanges. Analyzing the art market, it can be seen that there is a need for a new investment model. High hopes are placed in blockchain technology, which creates new opportunities for the development of this market. At the same time, the use of innovative technology is a source of risk for this method. It seems that market participants are wary of the new investment model and look at the changes taking place from a distance.

8. CONCLUSIONS

The combination of blockchain technology and the potential of the art market has resulted in the emergence of a new investment model – tokenization of works of art. According to the author, the application of this innovative model will not remove all obstacles to the development of the investment market in works of art, but it is able to eliminate them significantly. The advantage of the model is an increase in investment liquidity, greater availability, significantly lower costs than in the traditional model or transaction transparency. Certainly, these features affect the attractiveness of the new method and increase accessibility. The chance of its adaptation on the financial market will be affected by the development and wider use of blockchain technology. The general economic situation of the global economy will also affect the dissemination of this model (interest in alternative investments increases during the crisis). An extremely important element related to the functioning of art tokenization is the introduction of legal regulations on the issuance of secured tokens. This is one of the most important elements affecting the level of risk associated with investing in tokens. The next stage of research on the topic taken up in the article will be the assessment of the functioning and development of the new model and verification of how it contributed to the increase of turnover in the art market. In addition, it is worth checking whether the tokenization model has been accepted by participants of the investment art market.

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