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Market Value or Meta Value? The Value of Virtual Land during the Metaverse's Digital Era

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Abstract: Nowadays, some of the most expensive real estate is not "real" at all. Several investors are purchasing **land** in the virtual world of the Metaverse. To be more accurate in the wording, they are buying "meta-estates". This work is dedicated to opening a debate about this emerging research field within the real estate discipline. It begins by discussing market segmentation, ownership, and pricing by comparing the traditional real estate market with the virtual estate market. Furthermore, this study involved interviews with six seasoned Metaverse land investors who participated in two Analytic Hierarchy Processes (AHPs). The first AHP ranked 14 investment typologies, while the second focused on ranking and discussing the most important characteristics of meta-estates that influence the formation of prices. As a result, the most appealing investments identified were day-trading, virtual land trading (buying to resell), and virtual land development (transforming and reselling). The primary characteristics of meta-estates considered by investors include the platform (e.g., Earth 2, Sandbox), the location within the platform (proximity to famous neighbours), and the architectural design of the buildings (designed by renowned architects). It is evident that the Metaverse represents a new frontier for land investors, and the primary aim of this study was to encourage other researchers to explore and investigate this evolving field.

Keywords: land; virtual land; land value; meta value; Metaverse; blockchain; NFT; real estate; virtual estate

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1. Introduction and Background

The aim of research, in its broadest sense, is to advance knowledge by posing problems and developing insights that, when organised and put into practice, can lead to progress.

Research in the real estate sector has organised knowledge, created a strong theoretical framework, solved problems, and, more recently, investigated new technologies and techniques to expand theories of appraisal and valuation. The results achieved in this field are fundamental for both the academic community and professionals.

However, as has been observed many times before, and certainly by more authoritative voices than ours, the world is changing and it is changing fast. Today, surprisingly, some of the most expensive real estates are not "real" all. Several investors are purchasing, at very high prices, properties in the 3D virtual world of the Metaverse.

To be more precise, what investors are acquiring is a "**meta-estate**". In this article, the authors refer to the concept of a "meta-estate" within the context of the Metaverse as a virtual property that can be bought, sold, rented, or used to run an activity within one of the Metaverse's platforms. Similar to real estate, a meta-estate is defined by specific attributes such as its location within the platform, its dimensions, ownership rights, and its market value.

1.1. The Metaverse Era

On the 28 October 2021, Mark Zuckerberg announced: "*We are at the beginning of the next chapter for the internet, and it's the next chapter for our company too*" [1]. With this speech, he introduced his company's new name, Meta, and heralded a new era for the Metaverse, describing it as a more immersive experience, "*an embodied internet where you're in the experience, not just looking at i*t" [1]. The concept of the Metaverse is not new, but its practical and pervasive application in multiple fields of human activity is certainly novel.

First minted by Neal Stephenson in his 1992 book *Snow Crash* [2], the Metaverse is described as a web-shared virtual reality inhabited by virtual people named avatars. An avatar is a key concept for understanding the Metaverse's inner dynamics. An avatar can be described as the user's self-representation of the digital platform within that virtual world. Through their personal avatar, users can live, work, play, learn, socialise, and interact with other avatars (i.e., other people/users) in a connected and persistent virtual reality [3].

Interactions with other avatars inside the Metaverse serve multiple purposes, such as entertainment, socialising, gaming, and more. Behind these virtual experiences lies the well-known driver of monetary profit [4].

The Metaverse offers a plethora of opportunities to invest money. Mirroring real-world dynamics, among the different business options, purchasing virtual properties is one of the most popular economic investments in the Metaverse. Several companies and private investors have already made significant investments in what we call "meta-estates" [5].

1.2. What Is New?

Investing in meta-estates is, in many ways, very similar to investing in real estate. Issues such as market segmentation, ownership, investment, holding, developing, and using meta-spaces to conduct commercial and professional activities all remain relevant. Nevertheless, the platform is profoundly different. Transitioning from a real world to a virtual world changes some of the rules.

In the Metaverse, everything is timeless and spaceless. All physical constraints are eliminated by the instantaneousness of the internet. To quote a meaningful phrase, with your avatar, you can be "*everything everywhere all at once*" [6]. This absence of physical constraints creates new rules that drive the interactions between the avatars, whether they concern entertainment, work, or economic investments.

Revisiting familiar structures dedicated to the entertainment, the Metaverse is very similar to popular gaming platforms such as Second Life or Minecraft. However, the Metaverse's digital world is built on open blockchains. As will be explained further, blockchain technology serves as a digital method for securely recording information. Such technology allows one to record, stock, and share the chronological sequence of actions made by users, including monetary transactions and ownership.

Interesting, but not surprisingly, the most requested jobs in the Metaverse are considered to be the following: architect, non-fungible token designer, cybersecurity specialist, Web 3 developer, blockchain specialist, virtual reality content creator, privacy and data protection specialist, innovation manager, Metaverse event organizer, and storyteller [7].

It is noteworthy that the role of architect leads this ranking of Metaverse jobs, which is quite appropriate, as it is a world under construction, expansion, and development. Architects and developers invent and create new virtual spaces, cybersecurity and blockchain specialists manage the ownership records, while content creators, event organisers and storytellers populate such spaces and bring life (and people) inside them.

1.3. The Research Goals

In this new context, the present research article discusses the transposition of the real estate discipline inside the Metaverse. *What will be different? Which dynamics will remain the same? How can the "meta-estate" discipline be framed? How can a meta-market be defined? What will be the correct approach to assess the value of a meta-property? What will be the new investment dynamics and possibilities?*

There are numerous advantages and disadvantages to consider regarding investments in meta-land. Investing in real estate in the Metaverse may seem like a thrilling opportunity, but it presents a number of significant uncertainties that must be carefully considered. While certain aspects of the market dynamics in the Metaverse mirror those of real estate markets, the new rules at play introduce changes in behaviour and bring about new (and less known or understood) risk factors. In particular, investing in the Metaverse carries risks related to the market value of virtual real estate (intangibles).

New risk factors associated with (meta-)land investments may include, for example, higher price volatility, high uncertainty about future prices, significant regulatory gaps and, most critically, technical risks and dependency on the platform. It is clear that the value of a virtual piece of land is intrinsically linked to the operation, security, and success of the platform on which it is located, to the extent that if the platform fails, the land will lose its entire worth. Other than that, technical problems related to the use of the platform can also negatively affect the value of virtual land, such as hacks or disruptions. The meta-market can exhibit high volatility, with supply and demand behaving differently than in the real economy. These dynamics are often influenced by personal interests or technological developments over time. Determining the value of virtual property can be complex and subjective, as methods of valuation specific to the virtual world are still underdeveloped. It remains uncertain whether valuation techniques from the real world can effectively be applied in the context of the Metaverse.

Furthermore, predicting the development of different Metaverse platforms and, consequently, which lands will increase or decrease in value is extremely challenging. The popularity of a platform can change rapidly based on the users' preferences. Prices of virtual land are volatile and subject to sudden fluctuations. Lastly, it needs to be considered that the Metaverse market lacks clear regulatory frameworks compared with traditional real estate markets, resulting in a lack of investor protection [8,9]. Transacting virtual land in the Metaverse's platform is not subject to specific, tailored laws other than a few general legal issues such as ownership, financial taxation, and consumer protection rules (i.e., against fraud and deceptive business practices) [4]. Legal uncertainties can undermine the sustainability of the investment, as ownership in the Metaverse can raise issues regarding property rights and the security of digital property rights. Legal disputes over virtual property rights may arise, leading to uncertainties about who actually owns the assets.

Research and scientific publications in the field of the Metaverse are still limited, but as the platform becomes more populated with new users, it creates increasing opportunities for work and economic investment. This growth brings about a rising demand for professionals to operate in this new business platform. Real estate specialists, more aptly termed "virtual estate specialists", will be increasingly required to produce property valuations and business plans for the stakeholders.

Against this background, the authors of this article propose an exploratory analysis as an initial step towards understanding this new landscape. The intention is to establish a solid qualitative framework that can serve as the basis for initiating a debate on these emerging topics, defining a new research field within the real (virtual) estate discipline, and inviting other authors to conduct further analysis.

With the intention of taking the initial steps into this stimulating new research area, the authors interviewed a group of seasoned investors in the Metaverse's land to better understand their motivations for investing in meta-land and the factors they consider to be determinants of the "correct" pricing of meta-values when purchasing virtual estate. Specifically, the investors were interviewed to conduct an Analytic Hierarchy Process to discuss and analyse different investment options and different features of meta-land so as to:

- Identify and rank the motivations of individual investors seeking the Metaverse's land;
- Understand the factors that primarily contribute to determining the values of meta-estate.

Next, Section 2 discusses the crucial real estate topics and how they can be interpreted inside the Metaverse. Section 3 presents the methodological approach used to perform the

Analytic Hierarchy Process, whereas Section 4 illustrates the Analytic Hierarchy Processes' development and results. At the end, Section 5 presents the conclusion of this research, outlining future possible developments and ideas.

2. Old Issues, New Platforms

The following three paragraphs focus on comparing the real and virtual markets' dynamics, considering, in particular, the concepts of segmentation, ownership, and value/price.

2.1. Market Segmentation

The initial step in analysing a real estate investment involves identifying the market segment in which the investment will occur. However, when the investment pertains to 'meta-land', determining how to segment the market becomes a challenge.

In the real estate discipline, numerous characteristics define a market segment. As outlined in the real estate discipline [10], these characteristics encompass:

- The estate's use (residential, commercial, directional, productive etc.);
- Location (which city, central, semi-central, peripheral);
- The building's status (under construction, new, refurbished, obsolete);
- The type of building (villa, detached house, terraced house, multi-storey building, apartment, etc.);
- The building's quality and characteristics (dimension, finishes, materials, furniture, etc.);
- Market characteristics (demand, supply, opacity, barriers, etc.);
- Availability of the property (vacant, occupied).

Certainly, the structure of this segmentation remains intact when transitioning from a physical to a virtual realm. However, some characteristics may diminish in significance, while others emerge alongside new features.

Firstly, it is crucial to distinguish among distinct types of virtual spaces. Some exist purely within the digital sphere and are entirely fabricated (such as The Sandbox). Conversely, in instances such as Earth 2, the boundaries blur as "meta-estate" merges with physical real estate, where real-world land corresponds to a 3D representation in the virtual domain. This dichotomy could serve as an initial segmentation criterion: does the property possess a counterpart in reality, or is it solely a product of creative imagination?

This initial and pivotal distinction directly ties into the concept of scarcity. It is widely acknowledged that the land in real estate is a very scarce resource, and this scarcity extends to twin properties because meta-estates, logically, can only be as many as real estates. However, within the "invented" Metaverse, the concept of scarcity might be nullified, except for constraints beyond meta-land's availability. Theoretically, infinite Metaverses could exist and they could be expanded, transcending physical boundaries and only restricted by the capacity of internet servers to host such vast amounts of information.

Another fundamental segmentation factor could be identified in the platform used to buy and sell virtual lands. Among them, there are:

- Decentraland;
- The Sandbox;
- Voxels;
- Worldwide Webb;
- Treeverse;
- Earth 2;
- Others.

The concept can indeed be complex. While we often conceptualize the Metaverse as a singular entity, in reality, multiple Metaverses coexist as entirely separate realities. Every platform operates with its own set of rules, possibilities, spaces, and currency systems. For example, Voxels and Decentraland are virtual worlds based on blockchain and non-fungible tokens [11], where the investors can buy, sell, and develop meta-estate using the Ethereum blockchain. The Sandbox serves as both a virtual world (as well as a gaming platform) where estates are represented as LAND tokens. Moreover, the abovementioned platforms are not the only places to purchase virtual land. In fact, a significant share of land is also traded on secondary markets or via third-party marketplaces.

Another factor of market segmentation revolves around the type of meta-estate available. Land parcels may be sold either as empty plots or already developed areas, while constructed properties, such as apartments within buildings, are also tradable. Such macro-categories of segmentation are summarized in Figure 1.

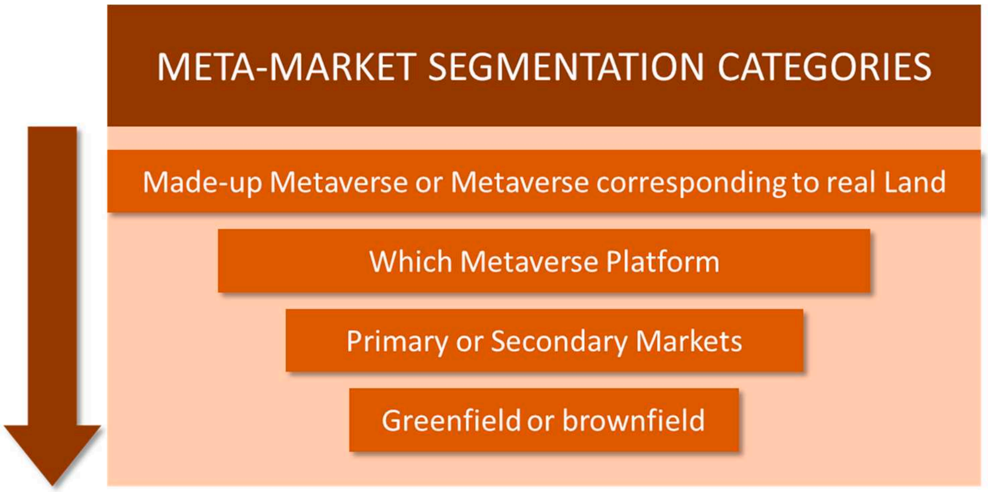

Figure 1. Macro-categories of market segmentation.

In Table 1, the characteristics that can act as features of segmentation in the real estate market are compared versus the meta-estate market. Specifically, it suggests which characteristics act as an element determining segmentation in the market (Yes) and which do not (No).

Table 1. A comparison of the characteristics of market segmentation.

Segmentation	Real Estate Market	Virtual Estate Market	Motivation
Location—Metaverse platform	No	Yes	Each platform determines different market types, with their own supply and demand functions
Location's area—central, semi-central, peripheral	Yes	No	In the Metaverse, distance from the centre loses significance due to the physical dematerialisation of the users
Location—Near to points of interest	Yes	Yes	Proximity to points of interest remains, whether the points of interest are real or virtual
Estate's use—residential, commercial, retail, directional, productive etc.	Yes	No	In the Metaverse, the intended use, as well as the level of maintenance and the quality of materials and construction, are not binding (for the time being), because the transformation from one use to another is free from construction, urban, and economic constraints. Similarly, a virtual property is not subject to deterioration and obsolescence. Finally, any transformation in the Metaverse is possible in monetary and regulatory terms, net of the costs of computer programming
Building's status—under construction, new, refurbished, obsolete	Yes	No	
Building's quality and characteristics -dimension, finishes, materials, furniture, etc.	Yes	No	

Table 1. *Cont.*

Segmentation	Real Estate Market	Virtual Estate Market	Motivation
Type of building—villa, detached-house, terraced-house, multi-storey building, apartment, etc.	Yes	Yes	The building type determines the market segment, as this differentiation defines different targets of demand
Market characteristics—demand, supply	Yes	Yes	The characteristics of supply and demand define the level of the market's competitiveness and the price of equilibrium
Market opacity	Yes	No	In the Metaverse, access to information is transparent, also due to the blockchain technology
Platform's characteristics	No	Yes	The characteristics of the Metaverse platform, clearly not involved in the real estate market, determine the supply and demand functions
Availability of the property—vacant, occupied	Yes	Yes	Whether the property is available or not, regardless of the type of market (real or virtual), determines the waiting time and thus the buyer's willingness to wait
Currency of exchange	No	Yes	The currency of exchange can be a barrier to entry in the Metaverse market

2.2. *Ownership*

Ownership of real estate is proven through transaction deeds and contracts, whereas ownership of a meta-estate is secured through blockchain technology [12]. Indeed, transactions in the Metaverse take place via smart contracts "written" on a blockchain [13]. A blockchain is a digital database (ledger) shared within a peer-to-peer network. The blockchain ledger enables a safe recording of the transactions between two parties without the need for a third intermediary, storing information in digital format. Blockchain technology, as suggested by its name, consists of a chain of blocks, with each block containing a ledger of transactions. This chain is continuous, as each block is linked to the previous one via a cryptographic code. Consequently, the blockchain facilitates the management and updating of an open registry containing data and information. Such data are shared and distributed without the need for a centralised control and a verification entity. Smart contracts are self-executing agreements where the terms are written directly into the code and ownership of the meta-estate is represented by non-fungible tokens (NFT), which confer digital property rights. Each land unit's ownership is specifically represented by an NFT on a blockchain, facilitating transactions and preventing replication [14]. The NFT keeps track of the ownership records, ensuring that ownership cannot be counterfeited.

A NFT can be seen as an asset with a unique code and unique metadata. When a purchase is made, the buyer acquires this unique digital identification, and the NFT is transferred to the buyer's virtual wallet. From that moment on, the owner has complete rights over the piece of virtual land, being able to develop, rent, or resell it.

Generally, purchasing land in the Metaverse is conducted using cryptocurrency. Land assets are bought and sold with cryptocurrencies through the use of a blockchain technology, and each Metaverse platform usually has its own cryptocurrency. Blockchains allow different platforms to have their own cryptocurrency, thereby creating distinct financial ecosystems. For example, the currency Ethereum is a popular choice, SAND is the currency associated with the platform The Sandbox, and MANA is associated with the Decentraland platform. Cryptocurrency transactions are subject to specific financial regulations in different jurisdictions.

2.3. *The Meta-Value*

When pricing an estate, several characteristics are assessed by both the buyer and the seller. The demand side assesses whether the asking price set by the seller aligns with the features and attributes the property offers. According to the "new approach to consumer theory" proposed by Lancaster [15], an utility function can fully describe the price of an estate if its characteristics are individually priced and considered. The price is, therefore, not merely associated with the good itself but it is connected to its specific features. Understanding all the contributing factors that comprise the utility function used to assess the price of a property is crucial. Each characteristic and attribute plays a role in shaping the perceived value and ultimately influences the pricing decisions made by both buyers and sellers.

In the real estate sector, it is well known that the value of an asset depends on a bundle of characteristics of the property [16], and identifying such contributing factors helps in understanding the consumers' behaviour and the demand choices.

According to [17], a categorisation of the characteristics that contribute to the formation of market value can be provided, and they are:

- Urban location,
- Intrinsic position,
- Typological features (seize, technological, . . .),
- Productive potential (generating income, ...).

In the real estate, certainly, the primary factors determining an asset's market value are mainly related the property's location and to its features of construction [18,19]. In the Metaverse, however, the characteristics that determine the meta-value of a meta-estate differ significantly. Some physical aspects lose their importance, while new variables come into play.

The location of a meta-estate may still be an important factor, but not in relation to services such as transport and public infrastructure. Accessibility and urban amenities are excluded from such considerations. Instead, other location-based factors could influence the meta-value, such as the position within the Metaverse or the specific Metaverse platform.

As far as the features of construction are concerned, attributes such as the rooms' brightness, natural ventilation, indoor environmental quality, or utility spaces lose significance. Conversely, visibility on social networking platforms, the presence of famous neighbours, an active community, or an innovative design project may be hugely relevant.

Instead, the property's income-generating potential could be tied to its suitability for hosting digital events or conducting virtual commercial activities. These factors highlight the distinctive dynamics of determining value in the Metaverse, where traditional physical characteristics give way to digital and social metrics.

3. Methodological Approach

According to the scope of this research presented in Section 1, an investigation was carried out by interviewing a group of Metaverse land investors to better understand the motivations (MOT) behind their investments in meta-land, and the factors (FAC) they consider to be determinants for the pricing of meta-values. The insights from these interviews provide valuable perspectives on the key drivers and considerations influencing virtual real estate investments.

As for the MOT, different types of investments, such as those in banks, real land, or virtual land, were compared according to several decision-making criteria. This comparison aimed to understand the specific motivations driving investors toward virtual land compared with more traditional investment avenues.

Regarding the FAC (factors), a set of estate characteristics, such as the size of the property or its location within the Metaverse, were compared and evaluated according to a distinct set of valuation criteria. This assessment helped identify which characteristics are most influential in determining the meta-value of virtual properties.

Since it seems to particularly suite the problem, a multi-criteria analysis (MCA) is here employed using the structure of an Analytic Hierarchy Process (AHP) [20,21]. Factually, an AHP allows for the comparison and ordering of a set of options (alternatives) according to multiple decision-making criteria. Moreover, the AHP enables researchers to evaluate the qualitative aspects of a decision-making process, creating a quantification (scoring) of qualitative aspects that reflect the stakeholders' perspectives.

The AHP structures a subjective choice problem into a hierarchical system consisting of, in this case, three layers. The bottom layer is constituted by the alternative options of the decision-making problem. The middle layer displays the decision criteria, whereas the highest level represents the target to be maximised. In this research, the AHP was applied twice, since two different aspects needed to be evaluated:

- To understand the motivations (MOT) behind meta-investments;
- To hierarchise the factors (FAC) contributing to the formation of meta-value.

This dual application of the AHP allowed for a comprehensive analysis of both the motivations driving investments in virtual land and the factors that determine its value.

The first AHP was therefore named AHP(mot), where the target was the maximization of the profit, and the alternatives were different kinds of economic investment.

The second AHP was called AHP(fac): here, the objective was the maximization of the meta-value, and the alternatives were the characteristics of the meta-estate.

As far as AHP(mot) is concerned, the intent was to assign each alternative investment typology (a_mot) a corresponding score (MOT-SC) on the basis of the chosen selection criteria (c_mot).

In particular, a number Y of investment criteria (c_mot_Y) were introduced to assess the performance of each alternative with respect to the others, with $y \in N \{1, \ldots, Y\}$, whereas a number Z of alternative investment types was defined as (a_mot_z), given $z \in N \{1, \ldots, Z\}$. Such alternatives and criteria are illustrated in Section 4. Consequently, the goal of AHP(mot) was to assign a corresponding score to each zth option $MOT\text{-}SC_z$.

Regarding AHP(fac), similarly, the intent was to assign each of the meta-land's characteristic factors (a_fac) a corresponding score (FAC-SC) based on the chosen selection criteria (c_fac). Therefore, a set of N of alternative factors was defined as (a_fac_n), given $n \in N \{1, \ldots, N\}$, and a number M of selection criteria (c_fac_m) were given so as to assess the performance of each alternative with respect to the others, where $m \in N \{1, \ldots, M\}$. These alternatives and criteria are also illustrated in Section 4. The AHP(mot)'s goal was therefore defined as $FAC\text{-}SC_n$.

To summarize, the problem involved two different hierarchical systems. Each system had matrices of the criteria [C] and matrices of the alternatives [A]. Each matrix $\mathbf{[C]_{mot}}$ is an $Y \times Y$ real matrix, whose entries are defined as: $\mathbf{c\_mot_{ij}}$. The matrix $\mathbf{[C]_{fac}}$ is an $M \times M$ real matrix, whose entries are instead defined as: $\mathbf{c\_fac_{ij}}$. Each element of the matrices is the result of the investor's interviews and represents the relative preference expressed by the expert about the ith criterion in relation to the jth criterion. In general, the investor's opinions were expressed in terms of an ordinal numerical scale from 1 to 9, as in [22]):

- When $c\_mot/fac_{ij} > 1$, the ith criterion considered wes seen as more important than the jth criterion;
- When $c\_mot/fac_{ij} < 1$, on the contrary, it signifies that the ith criterion was considered to be less important than the jth criterion;
- When c_mot/fac_{ij} is equal to 1, it means that the investor considered the two criteria to have the same importance.

In order to develop the AHP, the matrices of the criteria of the pairwise comparison $\mathbf{[C]_{mot/fac}}$ were built up.

The matrices of the criteria were reciprocal to the main diagonal, meaning that $(c\_mot/fac_{ij}) = (1/c\_mot/fac_{ij})$.

$$[C]_{mot} = \left| \begin{array}{cccc} c\_mot_{11} & c\_mot_{12} & \ldots & c\_mot_{1Y} \\ c\_mot_{21} & c\_mot_{22} & \ldots & c\_mot_{2Y} \\ \ldots & \ldots & c\_mot_{ij} & \ldots \\ c\_mot_{Y1} & c\_mot_{Y2} & \ldots & c\_mot_{YY} \end{array} \right| \quad c\_mot_{ij}/1 \le i \le Y, \ 1 \le j \le Y$$

$$[C]_{fac} = \begin{vmatrix} c\_fac_{11} & c\_fac_{12} & \ldots & c\_fac_{1M} \\ c\_fac_{21} & c\_fac_{22} & \ldots & c\_fac_{2M} \\ \ldots & \ldots & c\_fac_{ij} & \ldots \\ c\_fac_{M1} & c\_fac_{M2} & \ldots & c\_fac_{MM} \end{vmatrix} \quad c\_fac_{ij} / 1 \le i \le M, \; 1 \le j \le M$$

From $[C]_{mot}$ and $[C]_{fac}$, the criteria's weight vectors w_mot and w_fac are derived. They are, respectively, a Y-dimensional column vector and an M-dimensional column vector. The elements are consequently denoted w_mot_i, with $1 \le i \le Y$ and w_fac_i, with $1 \le i \le M$.

$$w\_mot = \begin{vmatrix} w\_mot_1 \\ w\_mot_2 \\ \ldots \\ w\_mot_i \\ \ldots \\ w\_mot_Y \end{vmatrix} \quad w\_mot_i / 1 \le i \le Y$$

$$w\_fac = \begin{vmatrix} w\_fac_1 \\ w\_fac_2 \\ \ldots \\ w\_fac_i \\ \ldots \\ w\_fac_M \end{vmatrix} \quad w\_fac_i / 1 \le i \le M$$

Each w_mot_i and w_fac_i entry is calculated by the means, respectively, of the following Equations (1) and (2):

$$\forall\, i\ (c\_mot_{ij}), \qquad w\_mot_i = \frac{\sum_{j=1}^{Y} c\_mot_{ij}}{\sum_{i=1}^{Y} \sum_{j=1}^{Y} c\_mot_{ij}} \tag{1}$$

$$\forall\, i\ (c\_fac_{ij}), \qquad w\_fac_i = \frac{\sum_{j=1}^{M} c\_fac_{ij}}{\sum_{i=1}^{M} \sum_{j=1}^{M} c\_fac_{ij}} \tag{2}$$

After the criteria's weights had been assessed according to the investor's preferences, the pairwise comparison matrices for the alternatives were determined, one per each selection criteria. Specifically, matrix $[A]^{(y)}{}_{mot}$ can be seen as the alternative comparison matrix with a dimension of Z x Z, where, again, Z is the total number of alternative investments. Each entry of the matrix is called $a\_mot_{ij}{}^{(y)}$, being the preference for the ith alternative with respect to alternative j from the point of view of the yth criterion.

Conversely, $[A]^{(m)}{}_{fac}$ is the alternative comparison matrix with a dimension of N x N, where N is the number of factors determining the meta-value. In this case, each entry of the matrix is named $a\_fac_{ij}{}^{(m)}$, which is the investor's degree of preference for the ith alternative compared with the jth alternative, according to the mth criterion.

Each element $a\_mot/fac_{ij}{}^{(y/m)} = 1/a\_mot/fac_{ji}{}^{(y/m)}$, while $a_{ii}{}^{(y/m)} = 1\ \forall$ i.

As for the criteria matrices:

- When $a_{ij}{}^{(y/m)} > 1$, the ith alternative is judged to be better than the jth alternative,
- When $a_{ij}{}^{(y/m)} < 1$, the ith alternative is judged to be worse than the jth alternative,
- When $a_{ij}{}^{(y/m)} = 1$, the two alternatives are evaluated as being equivalent with respect to the yth/mth criterion.

$$\forall \text{ yth criterion (AHP\_mot)/ } c\_mot_y,\ y \in N\,\{1, \ldots, Y\} \rightarrow [A]^{(y)}{}_{mot} = \begin{vmatrix} a\_mot_{11}{}^{(y)} & a\_mot_{12}{}^{(y)} & \ldots & a\_mot_{1Z}{}^{(y)} \\ a\_mot_{21}{}^{(y)} & a\_mot_{22}{}^{(y)} & \ldots & a\_mot_{2Z}{}^{(y)} \\ \ldots & \ldots & a\_mot_{ij}{}^{(y)} & \ldots \\ a\_mot_{Z1}{}^{(y)} & a\_mot_{Z2}{}^{(y)} & \ldots & a\_mot_{ZZ}{}^{(y)} \end{vmatrix} \quad a\_mot_{ij}{}^{(y)} / 1 \le i \le Z, \; 1 \le j \le Z$$

$$\forall \text{ mth criterion (AHP\_fac)}/ \; c\_fac_m,\ m \in N\{1,\ldots,M\} \rightarrow [A]^{(m)}_{mot} = \begin{vmatrix} a\_fac_{11}^{(m)} & a\_fac_{12}^{(m)} & \ldots & a\_fac_{1N}^{(m)} \\ a\_fac_{21}^{(m)} & a\_fac_{22}^{(m)} & \ldots & a\_fac_{2N}^{(m)} \\ \ldots & \ldots & a\_fac_{ij}^{(m)} & \ldots \\ a\_fac_{N1}^{(m)} & a\_fac_{N2}^{(m)} & \ldots & a\_fac_{NN}^{(m)} \end{vmatrix} \quad a\_mot_{ij}^{(m)}/1 \le i \le N,\ 1 \le j \le N$$

To sum up the investors' preferences, two decision matrices were assessed according to the following Equations (3) and (4).

$$\forall\, i\, (a\_mot_{ij}^{(y)})/1 \le i \le Z \qquad d\_mot_{ij(\forall j=y)} = \frac{\sum_{j=1}^{Z} a\_mot_{ij}^{(y)}}{\sum_{i=1}^{Z}\sum_{j=1}^{Z} a\_mot_{ij^{(y)}}} \quad <\!-\!-\!> \ \forall\, j\, (d\_mot_{ij})/j = y \tag{3}$$

$$\forall\, i\, (a\_fac_{ij}^{(m)})/1 \le i \le N \qquad d\_fac_{ij(\forall j=m)} = \frac{\sum_{j=1}^{N} a\_fac_{ij}^{(m)}}{\sum_{i=1}^{N}\sum_{j=1}^{N} a\_fac_{ij^{(m)}}} \quad <\!-\!-\!> \ \forall\, j\, (d\_fac_{ij})/j = y \tag{4}$$

The decision matrix $[D]_{mot}$ is a Z × Y real matrix, while $[D]_{mot}$ is a N × M real matrix. The entries d_mot_{ij} and d_fac_{ij} represent the performance of every zth/nth alternative with respect to the yth/zth criterion.

$$[D]_{mot} = \begin{vmatrix} d\_mot_{11} & d\_mot_{12} & \ldots & d\_mot_{1Y} \\ d\_mot_{21} & d\_mot_{22} & \ldots & d\_mot_{2Y} \\ \ldots & \ldots & d\_mot_{ij} & .. \\ d\_mot_{Z1} & d\_mot_{Z2} & \ldots & d\_mot_{ZY} \end{vmatrix} \quad D\_mot_{ij}/1 \le i \le Z,\ 1 \le j \le Y$$

$$[D]_{fac} = \begin{vmatrix} d\_fac_{11} & d\_fac_{12} & \ldots & d\_fac_{1M} \\ d\_fac_{21} & d\_fac_{22} & \ldots & d\_fac_{2M} \\ \ldots & \ldots & d\_fac_{ij} & .. \\ d\_fac_{N1} & d\_fac_{N2} & \ldots & d\_fac_{NM} \end{vmatrix} \quad D\_mot_{ij}/1 \le i \le N,\ 1 \le j \le M$$

Once the weight vectors w_mot and w_fac and the decision matrices $[D]_{mot}$ and $[D]_{fac}$ had been defined, the vector $\boldsymbol{v}$_mot and v_fac of the global scores could be calculated by multiplying [D]x w, as in Equations (5) and (6):

$$v\_mot = [D]mot \cdot w\_mot \tag{5}$$

$$v\_fac = Dfac \cdot w\_fac \tag{6}$$

The final score assigned to each alternative (the scale of preferences of the investors) was the ith entry $\mathbf{v}\_mot_i$ of vector v _mot and the ith entry v_fac_i of vector v _fac, which are represented in the following Equations (7) and (8), respectively.

$$\forall\, i\, (v\_mot_i)/i = z, \text{ then} \qquad MOT-SCz = v\_mot_i \tag{7}$$

$$\forall\, i\, (v\_fac_i)/i = n, \text{ then} \qquad FAC - SC_n = v\_fac_i \tag{8}$$

$$v\_mot = \begin{vmatrix} v\_mot_1 \\ v\_mot_2 \\ \ldots \\ v\_mot_i \\ \ldots \\ v\_mot_z \end{vmatrix} \quad v_i/1 \le i \le Z$$

$$v\_fac = \begin{vmatrix} v\_fac_1 \\ v\_fac_2 \\ \ldots \\ v\_fac_i \\ \ldots \\ v\_fac_n \end{vmatrix} \quad v_i/1 \le i \le N$$

4. A Practical Interview: AHP

To conduct the AHP analysis, a group of six investors was gathered for interviews to provide their opinions. Among them, two were real estate investors, two were economists, and two were finance operators. They all were professionals with 10–30 years of working experience in their fields of expertise.

The investors were asked to define their priorities and express a preference among the alternative options proposed, according to a set of specific valuation criteria. Their diverse backgrounds brought a range of perspectives and expertise to the analysis, contributing to a comprehensive evaluation of the alternatives.

4.1. Setting the Objectives, the Criteria, and the Alternatives

The first phase of the interview consisted of setting the objectives, criteria, and alternatives of the two AHPs. Each element was explained and discussed with the investors. The AHP(mot) had the following definitions.

The objective MOT-SC_z is the maximum benefit achievable from the investment.

The evaluation criteria c_mot_Y, with $y \in N$ {1, . . ., Y} and Y = 6, are:

- $\mathbf{c\_mot_1}$ = return on investment (capital gain, monetary profit, periodical income);
- $\mathbf{c\_mot_2}$ = payback period;
- $\mathbf{c\_mot_3}$ = social benefit (social status, visibility);
- $\mathbf{c\_mot_4}$ = easy management (passive income, low cost of management);
- $\mathbf{c\_mot_5}$ = transformability into in other investments (change in business, trade, liquidity);
- $\mathbf{c\_mot_6}$ = perceptions of the level of risk (safety of the investment);

The alternatives representing different investment typologies $\mathbf{a\_mot_z}$, $z \in N$ {1, . . ., Z} with Z = 14, are:

- $\mathbf{a\_mot_1}$ = trading virtual land (buying to resell);
- $\mathbf{a\_mot_2}$ = holding virtual land (rent);
- $\mathbf{a\_mot_3}$ = developing virtual land (transformation and reselling);
- $\mathbf{a\_mot_4}$ = virtual land for running an activity (opening a commercial/professional business);
- $\mathbf{a\_mot_5}$ = trading real land (buy to resell);
- $\mathbf{a\_mot_6}$ = holding real land (rent);
- $\mathbf{a\_mot_7}$ = developing real land (transformation and reselling);
- $\mathbf{a\_mot_8}$ = real land for running an activity (opening a commercial/professional business);
- $\mathbf{a\_mot_9}$ = bank bonds/shares/stocks;
- $\mathbf{a\_mot_{10}}$ = day-trading;
- $\mathbf{a\_mot_{11}}$ = safe-haven assets (gold);
- $\mathbf{a\_mot_{12}}$ = opening a commercial activity (shop, reselling);
- $\mathbf{a\_mot_{13}}$ = opening a professional activity;
- $\mathbf{a\_mot_{14}}$ = other investment types (such as opening a firm-related activity).

As far as the second AHP is concerned, i.e., AHP(fac), the investors were given the following definitions:

The objective FAC-SC_n is the assessment of the meta-value.

The valuation criteria $\mathbf{c\_fac_m}$, $m \in N$ {1, . . ., M}, M= 4, are:

- $\mathbf{c\_fac_1}$ = economic investment or return on investment (reselling or rent);
- $\mathbf{c\_fac_2}$ =social criteria (visibility, status);
- $\mathbf{c\_fac_3}$ = digital management (cost of the server, cost of use, etc.);
- $\mathbf{c\_fac_4}$ = psychological criteria (FOMO).

The alternatives representing different characteristics of land contributing to the definition of meta-value $\mathbf{a\_fac_n}$, $n \in N$ {1, . . ., N} with N = 10, are:

- $\mathbf{a\_fac_1}$ = platform (Earth 2, The Sandbox);
- $\mathbf{a\_fac_2}$ = location in the platform I — next to point of interest POI;

- **a_fac$_3$** = location in the platform II — famous neighbours (VIP);
- **a_fac$_4$** = built land or empty land;
- **a_fac$_5$** = location in the building I — floor level, panorama;
- **a_fac$_6$** = building size;
- **a_fac$_7$** = building's architect — project of a famous designer/architect;
- **a_fac$_8$** = furnished or empty;
- **a_fac$_9$** = adapted for hosting events;
- **a_fac$_{10}$** = adapted for running an activity.

4.2. Running the AHP-MOT and AHP-FAC

By interviewing the six investors, both AHP(mot) and AHP(fac) were performed. Here, the experts compared the 14 investment options according to the previously defined decision-making criteria. The goal of the process in the first AHP was to maximise the overall benefit of the investment, considering monetary, social and economic returns, from the perspective of each criterion. In the second AHP, the investors compared 10 characteristics of meta-land according to four different criteria, and the goal was the meta-value.

The matrices of criteria were first provided to each investor to be filled out according to their preferences. To express their personal judgement, the investors used an ordinal scale ranging from 1 to 9 to express the relative importance of one element against oneother. Specifically:

- If investors assigned the value of "1", it signified that, in their opinion, the two elements were equally important to the process of selection;
- Values from 2 to 9 indicated that the option rated higher was considered better than the other. Here, the numerical values, in ascending order, expressed a degree of preference of one option over the other, from lowest to highest.

The definitions of preferences provided to the investors were as follows:

- "2", minimal;
- "3", slight;
- "4",: moderate;
- "5", medium;
- "6", strong;
- "7", demonstrated;
- "8", extreme;
- "9", total.

An example of a completed matrix is provided in order to show how the experts filled out their pairwise comparison matrices. The results in Figures 2 and 3 represent the preferences of Investor No. 1.

	Criterion 1	Criterion 2	Criterion 3	Critrion 4	Criterion 5	Criterion 6
Criterion 1	1	2	1	3	5	4
Criterion 2	1/2	1	1/2	1	3	2
Criterion 3	1	2	1	3	5	4
Critrion 4	1/3	1	1/3	1	2	1
Criterion 5	1/5	1/3	1/5	1/2	1	1
Criterion 6	1/4	1/2	1/4	1	1	1

Figure 2. Investor's 1 pairwise criteria matrix for AHP_mot.

	Criterion 1	Criterion 2	Criterion 3	Critrion 4
Criterion 1	1	2	1	1
Criterion 2	1/2	1	1/3	1/3
Criterion 3	1	3	1	1
Critrion 4	1	3	1	1

Figure 3. Investor's 1 pairwise criteria matrix for AHP_fac.

Once all the six investors had filled out their criteria matrix, the average weigh vectors were assessed according to Equations (1) and (2). In Figure 4, the weights are w_mot_1 = 21%, w_mot_2 = 18%, w_mot_3 = 21%, w_mot_4 = 22%, w_mot_5 = 9%, and w_mot_6 = 9%, while in Figure 5, the weights are w_fac_1 = 25%, w_fac_2 = 23%, w_fac_3 = 20%, and w_fac_4 = 31%.

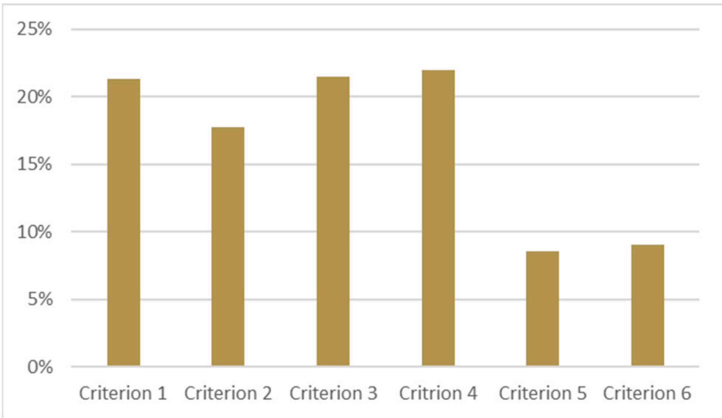

Figure 4. The AHP_MOT's weights.

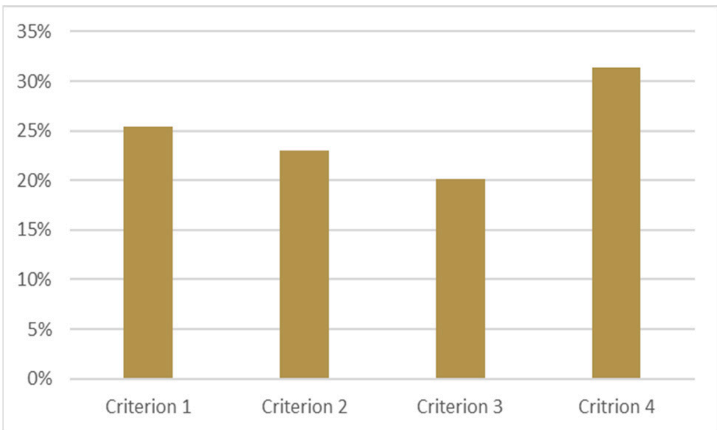

Figure 5. The AHP_FAC's weights.

In the second phase, the six investors filled out the pairwise comparison matrices to express their opinions about the alternatives. This time, they had to complete one matrix for each criterion, totalling six and four matrices each. Again, in Figures 6 and 7, examples of a completed table are reported, summarising the preferences of Investor No. 1 as far as Criterion 1 was concerned.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8	Alternative 9	Alternative 10	Alternative 11	Alternative 12	Alternative 13	Alternative 14
Alternative 1	1	1	1	1	1	3	1	1	4	1/2	4	2	1	1
Alternative 2	1	1	1/2	1	1	2	1	1/2	3	1/3	3	1	1	1
Alternative 3	1	2	1	2	2	4	1	1	5	1	5	3	2	1
Alternative 4	1	1	1/2	1	1	2	1	1/2	3	1/3	3	1	1	1
Alternative 5	1	1	1/2	1	1	2	1	1/2	3	1/3	3	1	1	1
Alternative 6	1/3	1/2	1/4	1/2	1/2	1	1/3	1/4	1	1/5	1	1	1/2	1/3
Alternative 7	1	1	1	1	1	3	1	1	4	1/2	4	2	1	1
Alternative 8	1	2	1	2	2	4	1	1	5	1	5	3	2	1
Alternative 9	1/4	1/3	1/5	1/3	1/3	1	1/4	1/5	1	1/6	1	1/2	1/3	1/4
Alternative 10	2	3	1	3	3	5	2	1	6	1	6	4	3	2
Alternative 11	1/4	1/3	1/5	1/3	1/3	1	1/4	1/5	1	1/6	1	1/2	1/3	1/4
Alternative 12	1/2	1	1/3	1	1	1	1/2	1/3	2	1/4	2	1	1	1/2
Alternative 13	1	1	1/2	1	1	2	1	1/2	3	1/3	3	1	1	1
Alternative 14	1	1	1	1	1	3	1	1	4	1/2	4	2	1	1

Figure 6. Investor's 1 pairwise criteria matrix for Criterion 1 in the AHP_mot.

Finally, the consistency index (CI) and the consistency ratio (CR) were calculated with regard to each matrix compiled [22] to verify the consistency of the experts' judgements when filling out the matrices. Given λ_{max} as the largest eigenvalue of the matrices, for the (6 × 6) criteria matrices, $C.I._{[C]mot} = (\lambda_{[C]mot\_max} - 6)/(6-1)$, while for the (4 × 4) criteria matrices, $C.I._{[C]fac} = (\lambda_{[C]fac\_max} - 4)/(4-1)$.

As far as the alternatives matrices (14 × 14) were concerned, $C.I._{[A]mot} = (\lambda_{[A]mot\_max} - 14)/(14-1)$, whereas for the (10 × 10) matrices $C.I._{[A]fac} = (\lambda_{[A]fac\_max} - 10)/(10-1)$.

All CI s were verified to be lower than 0.1 (average = 0.072; minimum = 0.031; maximum = 0.097), and the CR was lower than 0.2 (average = 0.098; minimum = 0.054; maximum = 0.134). Such results guaranteed good consistency in the judgements.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8	Alternative 9	Alternative 10
Alternative 1	1	2	1	6	6	4	1	7	3	3
Alternative 2	1/2	1	1/2	4	4	2	1/2	5	1	1
Alternative 3	1	2	1	6	6	4	1	7	3	3
Alternative 4	1/6	1/4	1/6	1	1	1/2	1/6	1	1/3	1/3
Alternative 5	1/6	1/4	1/6	1	1	1/2	1/6	1	1/3	1/3
Alternative 6	1/4	1/2	1/4	2	2	1	1/4	3	1	1
Alternative 7	1	2	1	6	6	4	1	7	3	3
Alternative 8	1/7	1/5	1/7	1	1	1/3	1/7	1	1/4	1/4
Alternative 9	1/3	1	1/3	3	3	1	1/3	4	1	1
Alternative 10	1/3	1	1/3	3	3	1	1/3	4	1	1

Figure 7. Investor's 1 pairwise criteria matrix for Criterion 1 in the AHP_fac.

In the third phase, the decision matrix was calculated, as presented in Figures 8 and 9. Here, the final score of MOT-SC_z was determined by means of vector v_mot_i of the global scores, and the score of FAC-SC_n was determined by means of v_fac_i.

	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5	Criterion 6	MOT-SC
Weigh	0.21	0.18	0.21	0.22	0.09	0.09	
Alternative 1	0.082	0.192	0.047	0.133	0.124	0.029	0.90
Alternative 2	0.063	0.050	0.118	0.112	0.124	0.022	0.73
Alternative 3	0.113	0.106	0.047	0.112	0.147	0.022	0.80
Alternative 4	0.063	0.050	0.118	0.090	0.124	0.019	0.69
Alternative 5	0.063	0.038	0.047	0.023	0.025	0.114	0.41
Alternative 6	0.028	0.031	0.047	0.018	0.021	0.141	0.35
Alternative 7	0.082	0.031	0.093	0.014	0.017	0.045	0.45
Alternative 8	0.113	0.038	0.118	0.018	0.021	0.087	0.60
Alternative 9	0.023	0.050	0.022	0.133	0.101	0.114	0.57
Alternative 10	0.154	0.192	0.047	0.112	0.147	0.022	1.00
Alternative 11	0.023	0.038	0.018	0.133	0.078	0.141	0.55
Alternative 12	0.045	0.073	0.093	0.047	0.025	0.114	0.57
Alternative 13	0.063	0.073	0.093	0.023	0.021	0.064	0.51
Alternative 14	0.082	0.038	0.093	0.033	0.025	0.064	0.51

Figure 8. The AHP_MOT's final decision matrix.

	Criterion 1	Criterion 2	Criterion 3	Criterion 4	FAC-SC
Weigh	0.25	0.23	0.20	0.31	
Alternative 1	0.192	0.177	0.282	0.229	1.00
Alternative 2	0.110	0.070	0.044	0.070	0.34
Alternative 3	0.192	0.177	0.044	0.229	0.78
Alternative 4	0.028	0.098	0.094	0.026	0.26
Alternative 5	0.028	0.057	0.042	0.058	0.21
Alternative 6	0.064	0.057	0.044	0.058	0.26
Alternative 7	0.192	0.138	0.044	0.191	0.68
Alternative 8	0.025	0.020	0.044	0.022	0.12
Alternative 9	0.085	0.138	0.181	0.058	0.49
Alternative 10	0.085	0.070	0.181	0.058	0.42

Figure 9. The AHP_FAC's final decision matrix.

5. Conclusions

5.1. Discussion of the Results of the AHP

As a result, a hierarchical order of preferences was assessed for all the alternatives provided, according to the different selection criteria taken into consideration. Among the different investment typologies, the final classification, presented in Figure 10, was as follows.Alternative 10, with a score of 12%: day-trading;

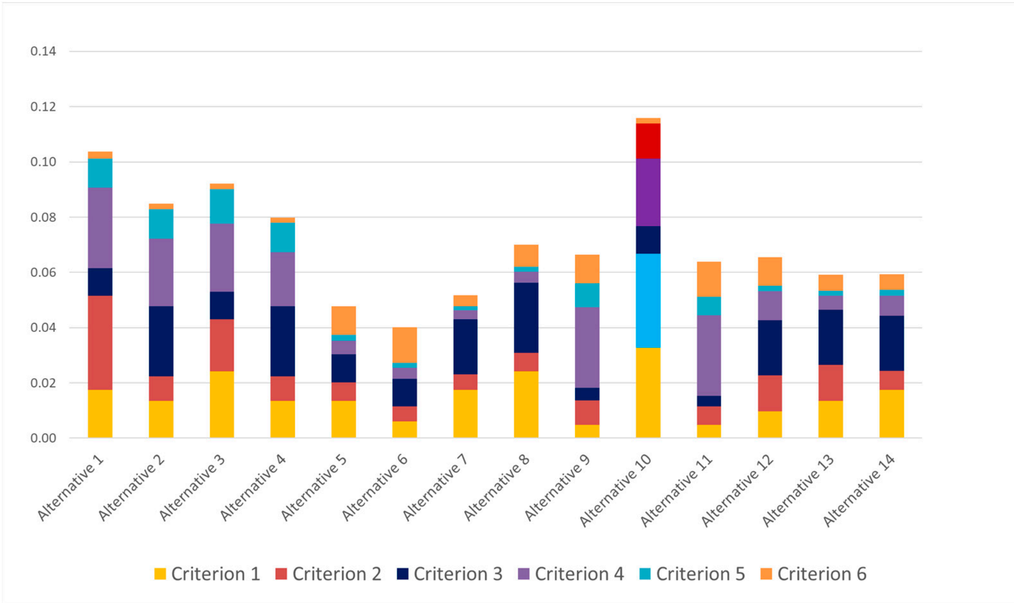

Figure 10. The AHP_MOT's final classification.

1. Alternative 1, with a score of 10%: trading virtual land (buy to resell);
2. Alternative 3, with a score of 9%: developing virtual land (transformation and reselling);
3. Alternative 2, with a score of 8%, holding virtual land (rent);
4. Alternative 4, with a score of 8%, virtual land for running an activity (opening a commercial/professional business);
5. Alternative 8, with a score of 7%, real land for running an activity (opening a commercial/professional business);
6. Alternative 9, with a score of 7%, bank bonds/shares/stocks;
7. Alternative 12, with a score of 7%, opening a commercial activity (shop, reselling);
8. Alternative 11, with a score of 6%, safe-haven assets (gold);
9. Alternative 14, with a score of 6%, other types of investment (such as opening a firm-related activity);
10. Alternative 13, with a score of 6%, opening a professional activity;
11. Alternative 7, with a score of 5%, developing real land (transformation and reselling);
12. Alternative 5, with a score of 5%, trading real land (buying to resell);
13. Alternative 6, with a score of 4%, holding real land (rent).

Day-trading and all investments in virtual land were among the top five of this classification. This outcome was attributed to the significant importance given in the assessment to Criterion 2, i.e., the payback period; Criterion 3, the social benefit; and Criterion 4, easy management. Therefore, according to the opinions of the six investors interviewed, when considering the similar monetary profits achievable, investing in virtual land is better due to the shorter time to recover from the investment and due to the easy management, as it is a type of passive income.

As far as the characteristics of the meta-estates are concerned, the classification of investors' preferences is provided here and illustrated in Figure 11.

14. Alternative 1, with a score of 22%, platform (Earth 2, The Sandbox. . .);
15. Alternative 3, with a score of 17%, location in the platform II—famous neighbours (VIP);
16. Alternative 7, with a score of 15%, building's architect—project of a famous designer/architect;
17. Alternative 9, with a score of 11%, adapted for hosting events;
18. Alternative 10, with a score of 9%, adapted for running an activity;

19. Alternative 2, with a score of 7%, location in the platform I—next to point of interest POI;
20. Alternative 4, with a score of 6%, built land or empty land;
21. Alternative 6, with a score of 6%, building size;
22. Alternative 5, with a score of 5%,location in the building I — floor level, panorama;
23. Alternative 8, with a score of 3%, furnished or empty.

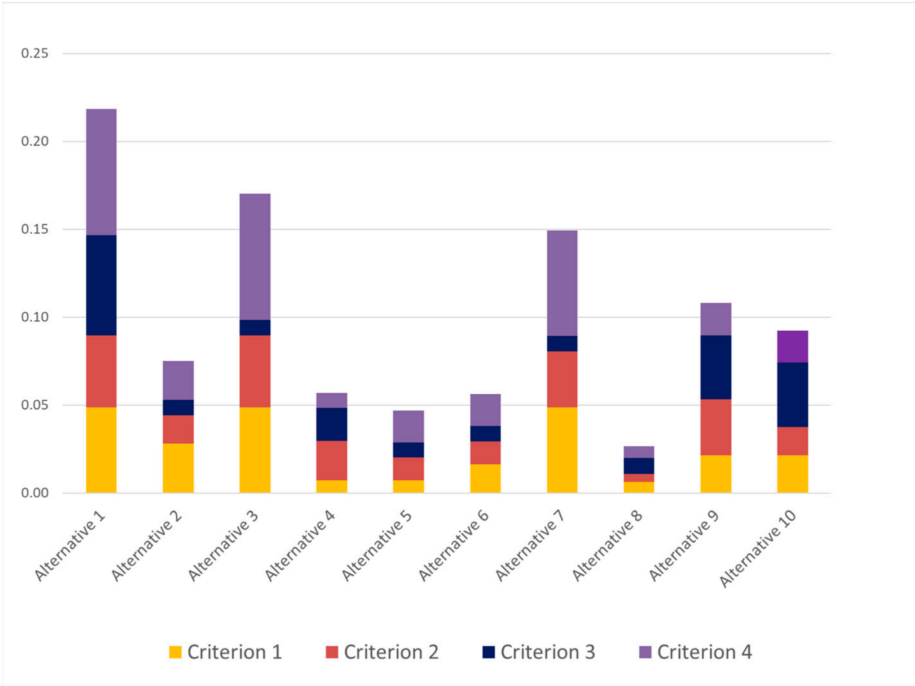

Figure 11. The AHP_FAC's final classification.

Such results demonstrated that the meta-value is strongly affected by the social visibility of belonging to a particular Metaverse platform. Key criteria in determining this hierarchy are, in fact, the social and psychological criteria, which are strongly related to the social status. While the return on economic investment remains a contributing factor, it is only significant if supported by the ease of management, particularly considering that the asset is virtual.

5.2. Conclusions and Further Developments

In this study, the authors have tried to open and explore a new research field for the real estate sector. With the increasing interest in real estate transactions involving "meta-land" within the Metaverse's platforms, the present analysis sought to construct a qualitative framework for this emerging disciplinary platform.

Specifically, the study discussed the transposition of real estate practices into the Metaverse, aiming to understand the differences and similarities that arise in comparison with investments in real land. By exploring these dynamics, the authors hope to provide valuable insights into the evolving landscape of virtual real estate investments.

First, a set of cornerstones of the real estate discipline were debated as if transposed inside the Metaverse's dynamics. They were the following.

- Market segmentation;
- Ownership;
- The value of a meta-property (here called the meta-value).

Then, to provide a qualitative analysis of this new landscape, a group of seasoned investors in Metaverse land was interviewed with a twofold objective.

The first objective was to gain a deeper understanding of the motivations driving the goal when investing in meta-land. This allowed for the ranking of different types of investment based on the return investors seek in investments in the Metaverse's land.

The second goal was to determine and rank the factors that investors consider to be determinants for the pricing of meta-land. This aimed to clarify the major factors that contribute to the pricing of virtual land.

To achieve this objective, the investors conducted an Analytic Hierarchy Process (AHP). This type of multicriteria analysis is considered to be highly suitable for the qualitative nature of the problem, allowing for a systematic evaluation and ranking of the factors influencing the pricing of virtual land.

During the first Analytic Hierarchy Process, the investors compared 14 different investment types according to six decisional criteria, i.e., the return on investment (capital gain, monetary profit, periodical income), the payback period, the social benefit (social status, visibility), ease of management (passive income, low cost of management), the transformability into in other investments (changing business, trade, liquidity), and perceptions of the level of risk (safety of the investment). As a result, the first three investments resulted from the ranking were, according to the level of preference: day-trading, trading virtual land (buy to resell), and developing virtual land (transformation and reselling).

During the second Analytic Hierarchy Process, the investors compared 10 different characteristics of the meta-properties across four decisional criteria, namely the economic criteria (return on investment), the social criteria (visibility, status), the digital management (cost of the server, cost of use, etc.), and the psychological criteria (FOMO). As a result, the first three characteristics of the properties were considered to be the most important, namely the platform (Earth 2, The Sandbox…), the location in the platform (famous neighbours), and the building's architect (project of a famous designer/architect).

The results of the analysis were influenced by the fact that the interviewed investors were familiar with digital investments and proficient in using web platforms. However, we still considered their ratings to be significant, as they express the sentiments of a new and growing portion of investors. In our view, a share of real estate investors could diversify their portfolio by mixing real and digital assets. As more platforms in the Metaverse emerge and develop, investments in virtual real estate are likely to become more common and widespread. Interestingly, investors highlighted several advantages of investing in "meta land," including the absence of management charges, the passive nature of the investment, and the lack of operational and maintenance responsibilities, akin to investing in a bank. Furthermore, these considerations are intertwined with the understanding that purchasing virtual property is closely linked to social and psychological factors, such as cultivating a digital presence and simply existing within the platform, similar to engagement with social media.

Among the primary limitations of this article, which will guide the future development of this research, are its exclusively qualitative nature and the relatively small sample of investors interviewed. The authors acknowledge that these factors limit the generalisability of their findings and consider them as a starting point for deeper exploration.

The authors consider this a starting point for further research. Moving forward, the authors intend to apply traditional quantitative methods to assess market values in the Metaverse's platforms. This will involve analysing the transaction data and asking prices to facilitate a structured comparison between the real estate market and the virtual estate market. Key aspects to be discussed include the market dynamics, risk profiles, the timing of transactions, the volume of transactions, and pricing trends. By integrating quantitative analyses alongside qualitative insights, the goal is to provide a more comprehensive understanding of how the virtual estate market operates and evolves compared with traditional real estate markets.

In conclusion, this article had the goal of opening a debate on the new topic of "virtual estate" investments inside the Metaverse. The aim was to define a new research field for the real (virtual) estate discipline and invite other authors to conduct further analysis.

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Conflicts of Interest: The authors declare no conflicts of interest.

Nomenclature

NFT	Non-fungible tokens
MOT	Motivations for investments in meta-land
FAC	Factors that determine the pricing of meta-values
AHP	Analytic Hierarchy Process
MCA	Multi-criteria analysis
AHP(mot)	
$\mathbf{a\_mot_z}$	Alternative investment typology, $z \in N \{1, \ldots, Z\}$
$\mathbf{c\_mot_Y}$	Investment criteria, $y \in N \{1, \ldots, Y\}$
$\mathbf{MOT\text{-}SC_z}$	Score
AHP(fac)	
$\mathbf{a\_fac_n}$	Alternative investment typology, $n \in N \{1, \ldots, N\}$
$\mathbf{c\_fac_m}$	Investment criteria, $m \in N \{1, \ldots, M\}$
$\mathbf{FAC\text{-}SC_n}$	Score
$\mathbf{[C]_{mot}}$	Matrix of the criteria for the pairwise comparison, dimension $Y \times Y$, entry $\mathbf{c\_mot_{ij}}$, $1 \leq i \leq Y, 1 \leq j \leq Y$
$\mathbf{[C]_{fac}}$	Matrix of the criteria for the pairwise comparison, dimension $M \times M$, entry $\mathbf{c\_fac_{ij}}$, $1 \leq i \leq M, 1 \leq j \leq M$
w_mot	Vector of the weight of the criteria $\mathbf{w\_mot_i}$ $1 \leq i \leq Y$
w_fac	Vector of the weight of the criteria $\mathbf{w\_fac_i}$, $1 \leq i \leq M$
$\mathbf{[A]^{(y)}{}_{mot}}$	Matrix of the alternatives in the pairwise comparison (for each *y*th criterion), dimension $Z \times Z$, entry $\mathbf{a\_mot_{ij}{}^{(y)}}$
$\mathbf{[A]^{(m)}{}_{fac}}$	Matrix of the alternatives in the pairwise comparison (for each *m*th criterion), dimension $N \times N$, entry $\mathbf{a\_mot_{ij}{}^{(m)}}$
$\mathbf{[D]_{mot}}$	Decision matrix, dimension $Z \times Y$, entry $\mathbf{d\_mot_{ij}}$
$\mathbf{[D]_{fac}}$	Decision matrix, dimension $N \times M$, entry $\mathbf{d\_fac_{ij}}$
***v*_mot**	Vector of global scores, entry $\mathbf{v\_mot_i}$
***v*_fac**	Vector of global scores, entry $\mathbf{v\_fac_i}$
CI	Consistency index
CR	Consistency ratio
λ_{max}	Largest eigenvalue of a matrix

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