

Alternative financing models of real estate investments: A Real Estate Crowdfunding Proposal

Francisco Barão Dias
francisco.barao@tecnico.ulisboa.pt
April 2019

Dissertation to obtain the master's degree
Civil Engineering
Instituto Superior Técnico

ABSTRACT

Keywords:

Real Estate
Crowdfunding,
Real Estate
Investment,
Lisbon Real Estate
Market,
Investment Analysis,
Real Estate,
Crowdfunding
Platforms

Traditionally, investment in real estate assets is restricted to private and institutional investors with high financial capacity. The high unit value of these goods and their indivisibility compromise the ability of potential investors to engage in these investments and prevent the formation of an organic market that would improve transparency and price setting.

Real estate crowdfunding has emerged in the last few years as a disruptive innovation in this sector by democratizing access to real estate investment, making it accessible to almost the entire population.

This study suggests a case studies analysis methodology to calculate the expected annual returns for this kind of investment, applied to the Lisbon real estate market, and to define the most beneficial characteristics to adopt.

The case studies definition was based on an intensive analysis of multiples crowdfunding real estate platforms active online, to select the most common scenarios of this market.

The analysis main conclusions indicate that the most positive real estate transactions are those based on the construction or rehabilitation of realties. Another conclusion was that the annual market valuation is very important but not decisive and the fees charged by the platforms reduces the results, but they do not make them unattractive. The average annual returns calculated were 13.2% for loans and from 8.8% to 18.8% for equity investments, very competitive results when compared with the most common financial products.

1. INTRODUCTION

1.1. Background

Real estate investment is one of the older forms of capital investment. It has played a very important role throughout the centuries, presenting itself as a source of wealth, power and economic success. Although, in the 90s, the heritage sector was considered as belonging to a type of economy of the past, its importance in macroeconomic terms did not change. At the beginning of the 21st century, some private and institutional investors have become interested in this type of market, valuing the stability and the duration that these assets present. [1]

Traditionally, direct investment in real estate assets, due to its intrinsic characteristics, is restricted to private investors with high financial capacity and institutional groups. The high unit value of these goods and their traditional indivisibility compromise the ability of potential investors (particularly private individuals) to engage in such investments and to diversify them. Another characteristic of these assets is related to the lack of liquidity they present. The participants in transactions of these real estate need to spend large sums of money to realize them. As such, the only access allowed to them depends on the possibility of obtaining bank loans and generally only on the purchase of their personal housing. Therefore, unlike other financial assets that are traded on the capital market, real estate assets have a small number of transactions. This feature, coupled with the heterogeneity of the spatial fixity of these assets, prevent the formation of an organic market that would allow, by defining prices by price, to make price definition more transparent and decrease the costs associated with access to real estate information.

The crowdfunding applied to real estate investment, also referred throughout the dissertation as real estate

crowdfunding or collaborative real estate investment, arises from the growing influence of collaborative financing in different sectors of society, and appears as a solution to many problems of the real estate investments. Giving access to real estate investment to practically the entire population, this new investment concept allows to democratize this traditionally very restricted sector. The aggregation of several small investments, through platforms created for this purpose, makes it possible to carry out real estate operations, in order to obtain a certain income for all the participants. As such, it completely transforms this type of investment making it affordable and quite simple due to all the tools that these crowdfunding real estate platforms provide. Turn real estate investment into an investment product for everyone. The responsibility to generate and market these products is from the different platforms that can also have the function of business and real estate prospecting, are responsible for managing all the necessary bureaucracies, to analyze financially the different products and to periodically monitor and report the investments development.

1.2. Aim

The present study intends to evaluate the financial feasibility of the application of real estate crowdfunding in the real estate market of Lisbon. By defining several case studies with distinct characteristics, it is intended to calculate the expected returns that this kind of product offers to potential investors. Finally, the final goal is to compare the results obtained with the yields offered by the most common financial products in the Portuguese financial market, to determine if investments in real estate crowdfunding are competitive in this market.

1.3. Methodology

This study suggests a methodology of case studies analysis, with the goal of calculating the expected annual returns for these investments, applied to the Lisbon real estate market, and to determine the most beneficial characteristics to be adopted.

The case studies definition was based on an intensive analysis of the multiples crowdfunding real estate platforms in activity online, in order to select the common scenarios of this specific market.

2. STATE OF THE ART

2.1. Real estate investment introduction

Real estate investment is characterized as the capital application in real estate assets with the purpose of generating income, through multiples forms. The main goal associated with this kind of investment are, first of all, the need to acquire housing to live in, an office to work in, or a commercial space to start a local business. These situations, although not clearly aimed at obtaining income through real estate assets, are characterized as real estate investments. In addition to these situations, the two main reasons for a private or institutional investor to apply a certain amount to a real estate are the purchase of a property for the purpose of leasing it or for the purpose of selling it later for a value higher. [2]

2.2. Crowdfunding – origin, concept and evolution

The definition of collaborative funding (crowdfunding), which seems to be more accurate and complete, is attributed to [3]: *"The collecting of resources (funds, money, tangible goods) from the population at large through an Internet platform. In return for their contributions, the crowd can receive a number of tangibles or intangibles, which depends on the type of crowdfunding. It generally takes place on crowdfunding platforms, that is, internet-based platforms that link fundraisers to funders."*

The constant development of the collaborative financing market contributes to the emergence of different crowdfunding modalities in the various existing platforms. According to [3]–[5], among others, there are four broad categories of crowdfunding: donation-based campaigns (related mainly to social solidarity projects Reward - based (refers to cases where there is a reward, in the form of a product or service), Lending - based or Crowdlending (investors lend a certain amount to a singular, collective or institutional beneficiary), and Equity - based or Crowdfunding (investors receive a percentage of a particular business, company, or future profit). The relevant table of the ten crowdfunding models with the largest market volume in Europe is shown in table 1.

Table 1 – Crowdfunding models in Europe in 2016 [4], [6]

Type	Model	Global market value (10*6 €)	Average value per business	Onboard Rate	Successful Funding Rate
Crowd Lending	Peer-to-peer (P2P) Consumer Lending	696,81	6 382	25%	19%
	P2P Business Lending	349,96	111 633	12%	85%
Crowd Lending	Invoice Trading	251,87	27 029	28%	65%
Crowd Investment	Equity-based Crowdfunding	218,64	302 621	15%	78%
	Reward-based Crowdfunding	190,76	15 069	54%	53%
Crowd Investment	Real estate Crowdfunding	109,45	453 538	9%	93%
Crowd Lending	P2P Property Lending	95,15	119 133	15%	44%
Crowd Lending	Balance Sheet Business Lending	59,13	-	-	-
Crowd Sponsoring	Donation-based Crowdfunding	32,4	4 631	67%	75%
Crowd Investment	Debt-based Securities	22,85	275 817	54%	85%

2.3. Real estate crowdfunding – origin, concept and evolution

Real estate crowdfunding can be defined as a form of alternative financing, where real estate developers, who may be common owners, institutional or the platform itself, present a real estate project in a specific platform for this purpose, showing the expected financial advantages for investors. The basis of this kind of crowdfunding is to allow an ordinary person to apply a small amount to real estate assets. The aggregation of several small investments allows to form a larger amount that allows the realization of real estate investments, with certain associated income. [7]–[10]

Then it is indispensable to clarify that, within the scope of this study, it was decided to designate as real estate crowdfunding only the two categories related to equity and loan, and not to confuse with the class of peer to peer property lending, which only concerns collective loans given to someone who wishes to acquire a property.

2.4. Advantages and risks

According to several authors [7], [9], [11]–[13], the main benefits of crowdfunding real estate are:

- Greater transparency of the entire process and investment;
- Less middlemen;
- Higher execution speed;
- Greater monitoring of projects by those who invest;
- Immediate, direct and simple access to real estate investment products;
- Possibility of diversification of real estate investments:
- Diversification of sources of capital;
- Platforms have a great ability to scale your business;
- Better overall user experience.

Despite the multiples benefits presented, real estate crowdfunding entails some disadvantages and risks, which are mentioned by some authors [4], [9], [12] and listed below:

- Lack of confidence in platforms;
- Lack of investor experience;
- Unrealistic projections;
- Risks of fraud or hacking.

Despite the risks and less positive features that this type of investment has, Montgomery et al. (2018) concluded that, in analyzing all the characteristics of real estate crowdfunding, this new investment model presents itself as a disruptive innovation within the traditional real estate investment sector with great future development potential.

2.5. Real Estate Crowdfunding platforms and their process

A crowdfunding real estate platform can be characterized as an online marketplace that connects real estate developers seeking funding for their projects and ordinary individuals who invest small and medium-sized amounts with the aim of making them profitable (Schweizer & Zhou, 2016). The platform is responsible for analyzing all the projects submitted to it by the promoters, to select the projects that present themselves with good income, based on different tools, while at the same time do not have an elevated risk to the investors.

There are some platforms that also work as real estate developers. In these cases, platform analyzes the best opportunities in the market, and it itself develops the investment project. [11]

3. REAL ESTATE CROWDFUNDING

3.1. Online platforms studied

This section presents a summary of the extensive study carried out on the performance of the various real estate crowdfunding investment platforms in online activity. After an extensive research of multiples existing platforms, we identified those that play a more active role in the global market dynamics of real estate crowdfunding. This selection was based on several criteria, such as the overall value raised by the platform, the different models and characteristics of the platform and information and rankings drawn from various sources, such as the TAB Dashboard (2018) platform. Subsequently, 19 platforms were selected and subjected to further analysis. This choice is essentially on those that stand out in the main countries where this type of financing is most developed, those that for some reason have different or unique characteristics and the similarities that some markets of certain countries may have with a possible market developed from crowdfunding in Portugal.

3.2. Key Features of Real Estate Crowdfunding

It is important to note that, within this work and from this section, we will only focus on real estate projects crowdfunding of housing properties, in their different strands. Based on the analysis of the mentioned database and of the 19 platforms studied, the most relevant characteristics of real estate crowdfunding were defined. As most of these platforms come with varied and complex performance models, a model has been constructed that aims to simplify these characteristics and describes how the real estate crowdfunding investment is approached in the different platforms and in their respective projects. As such, the different particularities found were grouped into four distinct categories, which are presented in figure 1, and which are described in the following sections.

Real Estate Crowdfunding	Real estate operation model	It is related to the actions carried out by the promoter to make the initial investment profitable;
	Intrinsic characteristics of the property	Physical characteristics of properties involved in real estate crowdfunding projects;
	Specific features of the projects	Specific attributes that characterize the investment projects in real estate crowdfunding;
	Characteristics of the platform	Particularities affecting the direct or indirect intervention of the platforms within the scope of the investment projects.

Figure 1 - Categories of the main characteristics of real estate crowdfunding investments.

3.3. Real estate operation model

In the research carried out on the different platforms, and more precisely on the projects promoted by them, a great variety and creativity was found in the way that the promoters explored the different realities and properties, to obtain income. Therefore, a model scheme was constructed, which is presented in figure 2, which summarizes all the different options found and their possible conjugations, which translate most of the real options of real estate exploration in real estate crowdfunding investment projects.

Alternative financing models of real estate investments:

A Real Estate Crowdfunding Proposal

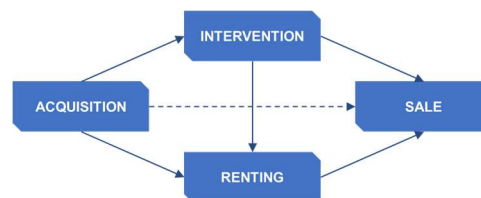


Figure 2 - Summary diagram of the different models of real estate operation.

Through the previous scheme (figure 2) it can be concluded that there are 4 types of models of real estate operation:

- Acquisition + Intervention + Leasing + Sale;
- Acquisition + Intervention + Sale;
- Acquisition + Leasing + Sale;
- Acquisition + Sale (pure speculation, is not addressed in this work).

Acquisition process

The acquisition process consists of buying the property that the developer wants, which is the basis of most of all real estate investment projects.

Property intervention

Unlike the procurement process, the intervention process is optional. It is not present in all real estate crowdfunding investment projects studied. This action adds a valuation to the property acquired through a physical alteration of the property. The intervention can then be a simple construction of an enterprise on an acquired property, or it may be a less or deeper requalification intervention, again, according to the needs of the asset.

Rental Models

The renting of one property or a set of properties is a way of making a real estate investment profitable. This solution is used by several promoters in the real estate crowdfunding projects present in the platforms studied. In figure 3 the three modalities are presented.

Property Renting Models	Long Term Renting (traditional)	This rental model consists of the realization of a lease with a long or average duration, which allows to obtain a fixed monthly return corresponding to the value of the agreed rent. This type of rental aims to provide answers to the housing needs of a particular location.
	Students Renting	This type of rental is characterized by being a temporary housing model, aimed at students. Although similar to traditional tenancy, it varies in the type of property or unit that is leased (often bedrooms) and in the established duration, usually only 11 months per year. This renting market presents itself as a financially viable alternative to the traditional model due to a high supply deficit in relation to demand.
	Short Term Renting	The short-term rental has recently emerged as a more authentic alternative in tourist accommodation. This model of renting is characterized, according to the decree-law nº 128/2014 like being a "provision of services of temporary accommodation". It is important to note that this type of lease has very different characteristics from the other modalities mentioned. The inherent costs (insurance, cleaning, day-to-day management), higher taxation and occupancy rate are key factors in the financial analysis of this solution.

Figure 3 – Rental models (Ministério da Economia, 2014).

Property sales process

The sale process does not present itself with many peculiarities other than a process of normal sale of a property. It is only necessary to underline the high relevance that annual valuation of real estate prices has on the results of the expected returns of these investments.

3.4. Intrinsic property characteristics

The features that are intrinsic to real estate are attributes that can have a great influence on the success of real estate investment projects. These attributes can define a higher or lower final profitability of the entire real estate crowdfunding project. As we have seen previously, all properties are a different product and have different characteristics. These characteristics define it and contribute to greater acceptance and appreciation by its future users. As such, we present below some of the factors that are considered to have a greater possible influence on the success of the type of investment studied. These factors are: the sale price; the property area; their location; the typology presented; the property construction year; and certain features and amenities such as elevators, balconies, swimming pool, garage, storage, terraces or even the number of toilets.

3.5. Project special features

Through the analysis to the online platforms database, the common aspects to all the projects were chosen, which characterize the financial model of the investments in this type of platforms, which are presented below:

- *Project Promoter* - The promoter is responsible for managing all events related to the development of the project;
- *Structure of invested capital* - Related to the division of capital invested in real estate projects crowdfunding;
- *Legal structure of investments* - There are two categories of real estate crowdfunding: equity and loan. The second works basically as loans of various types that investors give to real estate developers, who may either have a fixed interest rate or a variable interest rate with the results. The models of real estate equity crowdfunding acquire the form of participations of capital in societies that own the property and that are created exclusively for each project;
- *Remuneration plan* - Remuneration can be acquired at certain intervals, for example in situations of loans to promoters or in properties that are leased (monthly, quarterly, etc.). In addition, at the end of each project, or in cases where investors may sell their securities during the project, the net results arising from the valuation of the property are distributed;
- *Minimum and maximum investment amounts* - These are the minimum and maximum amounts that can be invested in real estate crowdfunding projects;
- *Project duration* - This point is characterized by being the total time of each project of real estate crowdfunding.

3.6. Platforms characteristics

Lastly, there are still the characteristics of the platform, which are particularities related to the way a real estate crowdfunding platform works or features that the platform introduces in all its projects. These factors are essential to complement the differentiation between some of the industry platforms. These characteristics are as follows:

- Structure and value of commissions;

- Secondary market and liquidity (secondary market that allows investors to sell their holdings before the investment project ends);
- Type of investors accepted;
- Process of analysis and selection;
- Relationship, communication with investors;
- Institutional partnerships;
- Social or environmental character of the operation of the platform.

4. CASE STUDIES

4.1. Lisbon Real Estate market analysis

The highlights of the real estate market in Lisbon are:

- In 2017, the Housing Price Index (*IPHab*) registered once again a growth of the average level of prices of the houses transacted, well above the verified inflation. Analyzing these data considering the real estate type transacted, it is observed that the prices of existing housing grew at a faster rate than in new housing (10.4% and 5.6%, respectively);
- The municipality of Lisbon registered the median sale price of the largest housing in the country, €2438/m² (INE, 2017);
- According to information from the main Portuguese real estate companies, in Lisbon, it takes only 74 days to complete the sale of a house;
- Regarding the traditional rental market, the municipality of Lisbon had the highest median value in the country in 2017 (€11.16 / m²) (INE, 2017, 2019);
- Regarding the student renting market, according to the *Uniplaces Student Rental Market Report* (2017), students room rent prices in Lisbon grew by more than 10% in 2017. In 2018, registered the highest value in the country for student housing, with an average income per room of €485 according to the data obtained at *Uniplaces*;
- Regarding the short-term renting (local accommodation), for this type of renting seasonality in the tourism sector has consequences in the significant variation of the prices practiced throughout the year. Nevertheless, according to an article written on the ECO platform (2019) and according to data from the AirDNA statistics platform (2018), in 2017, average prices per accommodation of €60 a day were practiced in the municipality of Lisbon, reaching even €70 in high season and decreasing to €50 in the low season. The platform in 2017 also registered an average occupancy rate in this city of 70%, reaching a maximum value of 84% in September and a minimum of 46% in January.

Lastly, regarding forecasting the evolution of real estate prices, it should be noted that, according to a survey carried out on this subject, it is possible to find several opinions of different players in this market which, for the most part, point to prices continuing to grow, but with a slower pace. The forecast by the US credit rating agency Standard & Poor's (S & P) foresees a growth of 5% in 2019 and a growth of 4% in 2020 and 2021.

4.2. Cases studies presentation

In this section we will briefly outline the properties chosen to evaluate the different investment options in real estate crowdfunding as well as the reasons for the same choice. It is important to point out that the properties were chosen through a survey of the main Portuguese real estate mediation sites according to criteria that fit each case. These criteria were established considering: the different characteristics that collaborative real estate investments can present, which are exposed throughout Section 3.2; the various assumptions and simulations to be presented later in the next sections; and always looking for properties that presented themselves as good opportunities in the market.

In the first place, it was defined what would be the models of real estate operation that would be contemplated so that it was possible, together with the intrinsic characteristics of the real estates, to select the case studies that represented a broad spectrum of collaborative real estate investment options. These real estate transactions are shown in figure 4.

Real Estate Operation 1	A) Acquisition + Rehabilitation + Short Term Rental + Sale B) Acquisition + Rehabilitation + Sale	Property 1&2 (Im1 & Im2)
Real Estate Operation 2	A) Acquisition + New Construction + Traditional Rental + Sale B) Acquisition + New Construction + Sale	Property 3&4 (Im3 & Im4)
Real Estate Operation 3	Acquisition + New Construction + Student Rental + Sale	Property 5 (Im5)
Real Estate Operation 4	Acquisition + Traditional Lease + Sale	Property 6&7 (Im6 & Im7)
Real Estate Operation 5	Acquisition + Rental Students + Sale	Property 8 (Im8)

Figure 4 - Types of real estate operation approached and their properties.

4.3. Summary of selected properties characteristics

Table 2 shows the different characteristics of the chosen properties, to observe the diversity of their attributes, such as location, areas, typology and purchase price. It is important to emphasize that these properties are chosen based on the real estate operation to which they are associated. It is important to note that some of the particularities presented only manifest themselves after the interventions described in section 5.1.

Table 2 - Summary of selected properties characteristics.

		Location	Acquisition Value	Initial Property Area (m2)	Acquisition Value/m2	Final Typology	Final Units Area (m2)
Op 1	Im1	Arroios	262 000,00 €	80	3 275,00 €	T2	80
	Im2	Estrela	255 000,00 €	60	4 250,00 €	T1	60
Op 2	Im3	Penha de França	1 750 000,00 €	700	2 500,00 €	T2/3	110
	Im4	Benfica	1 100 000,00 €	327	3 363,91 €	T2/3	85
Op 3	Im5	Ajuda	3 000 000,00 €	2000	1 500,00 €	T0	20
Op 4	Im6	Campolide	850 000,00 €	189	4 497,35 €	T3	189
	Im7	Belém	890 000,00 €	200	4 450,00 €	T4	200
Op 5	Im8	Benfica	250 000,00 €	92	2 717,39 €	T3	92

5. CASE STUDIES ANALYSIS

5.1. Financial analysis of investment projects

In this section we intend to present a financial analysis to real estate investment projects of crowdfunding applied in Lisbon. From the case studies presented in section 4.2, which are defined considering the real estate operations referred to (Op1, Op2, Op3, Op4 and Op5) and the immovable properties (Im1, Im2, Im3, Im4, Im5, Im6, Im7 and Im8), some investment simulations will be performed based on real values of the different variables under study. For each property considered, according to the respective real estate operations, a financial analysis was performed to obtain the expected annual profitability values for each case. The analyzes carried out refer to the application of the real estate transaction that was intended for each of the properties by obtaining the values for each one of the parcels of the same, that is, for the portion of the acquisition, intervention, lease and sale. Based on these values, the initial investment required for each of the projects, the expected gross revenues, the expected gross income and the total duration of each of the projects is determined, the percentage of annual profitability is obtained. It is important to mention that the simplest form of representing the simulations performed for each of the properties under study, considering the variations that were intended, was considering that, for each property, there were different alternatives of investment projects that differed (0 years, 1 year, 2 years, 3 years, 4 years or 5 years).

Acquisition costs

The total costs involved in the acquisition of the properties are shown in table 3. It should be noted that the first two properties have an exemption with respect to the payment of IMT.

Table 3 - Acquisition Costs.

		Property Price	Fees (IMT + Imp. Selo)	Acquisition Cost
OP 1	Im1	262 000,00 €	- €	262 000,00 €
	Im 2	255 000,00 €	- €	255 000,00 €
OP 2	Im 3	1 750 000,00 €	127 750,00 €	1 877 750,00 €
	Im 4	1 100 000,00 €	80 300,00 €	1 180 300,00 €
OP 3	Im 5	3 000 000,00 €	219 000,00 €	3 219 000,00 €
OP 4	Im 6	850 000,00 €	57 800,00 €	907 800,00 €
	Im 7	890 000,00 €	53 400,00 €	943 400,00 €
OP 5	Im 8	250 000,00 €	12 500,00 €	262 500,00 €

Intervention cost

The real estate operations Op1, Op2 and Op3 have a share of intervention in their respective properties. In the case of Op1, Im1 and Im2 real estate undergo a rehabilitation action that aims to fully recover real estate. In the case of other real estate transactions, the intervention is identified as being of new construction of buildings, in properties Im3 and Im4 for traditional housing and in property Im5 for special student housing. In relation to the Im1 and Im2 properties, through the data and photographs that were possible to analyze, a budget was obtained by a Civil Engineer with experience in these interventions, of the rehabilitation costs of both properties. It is important to note that there was still a need to consider the costs associated with all the furniture and other necessary objects that were estimated for each of the properties, considering their

needs. The table below (table 4) shows the total costs of intervention for these properties.

Table 4 - Intervention costs (Im1 and Im2).

	Intervention Cost	Intervention Cost/ m2	Other costs	Intervention total costs
Im1	33 426,00 €	417,83 €	4 000,00 €	37 426,00 €
Im2	28 355,00 €	472,58 €	3 500,00 €	31 855,00 €

For the realties Im3, Im4 and Im5, the interventions considered have the character of new constructions. In these cases the real estate operation in question (Op2 and Op3) consists of acquiring a plot of land and building a new building. In the land of the property Im3 the objective would be to construct 24 apartments, T2 and T3, with 110m² of useful area. In the second property mentioned, Im4, it is intended the development of 10 apartments, T2 and T3, with 85m² of floor area. And finally, on the Im5 property site, the objective would be to build a student residence that would have 190 student housing units, T0 (with kitchenette and sanitary facilities in each unit), and 20m² of floor space each.

In order to determine the costs involved in these construction operations, an expert from an integrated project management company with extensive experience in real estate investments and specifically in the construction of new buildings was used. In this way, the expert established some premises, which included the use of unit costs, and through the possible gross areas of construction, the total costs of intervention for each of the three properties were established, which are presented in table 5.

Table 5 - Construction costs (Im3, Im4 and Im5).

	Gross Construction Area	Gross Construction Area Above Ground	Gross Construction Area Bellow Ground	Cot Above Ground	Cost Bellow Ground	Project Cost	Licenses and fees (TRIU)	Total Construction Costs
Im3	3800 m2	3200 m2	600 m2	3 840 000 €	300 000 €	207 000 €	216 600 €	4 563 600 €
Im4	1500 m2	1000 m2	500 m2	1 200 000 €	250 000 €	72 500 €	85 500 €	1 608 000 €
Im5	6800 m2	4200 m2	1600 m2	5 040 000 €	800 000 €	262 800 €	387 600 €	6 490 400 €

Rental income

The revenues obtained through the various types of lease that are studied in the different case studies are presented next:

- Short term renting (Op1):

In real estate operation Op1, Im1 and Im2 properties are considered as being subject to rehabilitation and are placed on short-term lease arrangements. This scheme has several peculiarities that distinguish it from other types of lease. To obtain the values of the daily stays of the two properties, five houses (for each of the properties) that were close to the study cases and that had similar intrinsic characteristics were researched and selected (using the *Airbnb* platform (Airbnb, 2018)). Based on the average values of the daily stays of each of them, for each of the three epochs, the probable daily prices of the stays for the Im1 and Im2 properties were defined.

Then, using the previous values and data collected on occupancy rates for the three seasons, the total gross value generated by the short-term lease was calculated for one year (called gross annual rent), as can be seen in table 6 and table 7 for Im1 and Im2 respectively. Next, all annual expenditures associated with the use of real estate and total revenues for each of the years of the life

cycle studied were calculated, which are also shown in table 6 and table 7. It is important to note that all the amounts referred to in this section are updated for all years considered based on the average inflation value of the last ten years (1.06%).

Table 6 – Annual financial analysis of revenues and costs for Im1 property

	Year 1	Year 2	Year 3	Year 4	Year 5
Annual Gross Rent	19 883,24 €	20 094,00 €	20 307,00 €	20 522,25 €	20 739,79 €
Host fees	596,50 €	602,82 €	609,21 €	615,67 €	622,19 €
Gross Annual Revenue	19 286,74 €	19 491,18 €	19 697,79 €	19 906,59 €	20 117,60 €
Telecommunications	360,00 €	363,82 €	367,67 €	371,57 €	375,51 €
Water Supply	550,00 €	555,83 €	561,72 €	567,68 €	573,69 €
Electricity	700,00 €	707,42 €	714,92 €	722,50 €	730,16 €
Insurance	52,58 €	53,14 €	53,70 €	54,27 €	54,85 €
IMI (fees)	-	-	-	-	-
Condominium	180,00 €	181,91 €	183,84 €	185,78 €	187,75 €
Maintenance	400,00 €	404,24 €	408,52 €	412,86 €	417,23 €
Annual Revenue	17 044,16 €	17 224,83 €	17 407,41 €	17 591,93 €	17 778,41 €
Cumulative Annual Revenue	17 044,16 €	34 268,99 €	51 676,41 €	69 268,34 €	87 046,75 €

Table 7 - Annual financial analysis of revenues and costs for Im2 property

	Year 1	Year 2	Year 3	Year 4	Year 5
Annual Gross Rent	13 889,75 €	14 036,98 €	14 185,77 €	14 336,14 €	14 488,11 €
Host fees	416,69 €	421,11 €	425,57 €	430,08 €	434,64 €
Gross Annual Revenue	13 473,06 €	13 615,87 €	13 760,20 €	13 906,06 €	14 053,46 €
Telecommunications	360,00 €	363,82 €	367,67 €	371,57 €	375,51 €
Water Supply	450,00 €	454,77 €	459,59 €	464,46 €	469,39 €
Electricity	600,00 €	606,36 €	612,79 €	619,28 €	625,85 €
Insurance	43,00 €	43,46 €	43,92 €	44,38 €	44,85 €
IMI (fees)	-	-	-	-	-
Condominium	120,00 €	121,27 €	122,56 €	123,86 €	125,17 €
Maintenance	300,00 €	303,18 €	306,39 €	309,64 €	312,92 €
Annual Revenue	11 600,06 €	11 723,02 €	11 847,28 €	11 972,86 €	12 099,78 €
Cumulative Annual Revenue	11 600,06 €	23 323,08 €	35 170,36 €	47 143,22 €	59 243,00 €

- Long duration (traditional) renting (Op1):

In real estate operation 2 and in real estate operation 4 the property under study are placed on the traditional rental scheme.

The determination of the amount of rent to be levied on the rental of the properties mentioned was also based on the comparative method, that is, five similar properties were searched in each case and the average rent per square meter of area. Then, based on the values obtained from monthly rentals, the potential annual gross income per unit of housing was calculated. The annual costs associated with the use of the properties were also calculated. Finally, it is important to note that all the values used in the analysis of tables 8, 9, 10 and 11 are updated for all years considered, from the gross annual revenues expected to the mentioned usage costs, including even the value of the *Municipal Real Estate Tax (IMI)*. The latter was considered in this way to reflect the possible variation of the tax asset value over the years. This update is based on the average inflation value of the last ten years (1.06%).

Table 8 – Annual financial analysis of revenues and costs for Im3 property

	Year 1	Year 2	Year 3	Year 4	Year 5
Annual Gross Rent potential/ unit	23 533,47 €	23 782,92 €	24 035,02 €	24 289,79 €	24 547,27 €
Units Number	24	24	24	24	24
Occupation Ratio	70%	85%	95%	95%	95%
Gross Annual Revenue	395 362,27 €	485 171,63 €	547 998,51 €	553 807,29 €	559 677,65 €
Insurance	1 960,92 €	1 981,71 €	2 002,71 €	2 023,94 €	2 045,39 €
Fees (IMI)	17 928,47 €	18 118,52 €	18 310,57 €	18 504,66 €	18 700,81 €
Maintenance	2 451,15 €	2 477,13 €	2 503,39 €	2 529,93 €	2 556,74 €
Annual Revenue	373 021,73 €	462 594,28 €	525 181,83 €	530 748,76 €	536 374,70 €
Cumulative Annual Revenue	373 021,73 €	835 616,01 €	1 360 797,84 €	1 891 546,60 €	2 427 921,30 €

Table 9 - Annual financial analysis of revenues and costs for Im4 property

	Year 1	Year 2	Year 3	Year 4	Year 5
Annual Gross Rent potential/ unit	14 719,72 €	14 875,74 €	15 033,43 €	15 192,78 €	15 353,83 €
Units Number	10	10	10	10	10
Occupation Ratio	70%	85%	95%	95%	95%
Gross Annual Revenue	103 038,01 €	126 443,83 €	142 817,56 €	144 331,43 €	145 861,34 €
Insurance	656,89 €	663,85 €	670,89 €	678,00 €	685,19 €
Fees (IMI)	4 334,38 €	4 380,33 €	4 426,76 €	4 473,68 €	4 521,10 €
Maintenance	1 010,60 €	1 021,31 €	1 032,14 €	1 043,08 €	1 054,14 €
Annual Revenue	97 036,14 €	120 378,34 €	136 687,78 €	138 136,67 €	139 600,91 €
Cumulative Annual Revenue	97 036,14 €	217 414,47 €	354 102,25 €	492 238,92 €	631 839,83 €

Table 10 - Annual financial analysis of revenues and costs for Im6 property

	Year 1	Year 2	Year 3	Year 4	Year 5
Annual Gross Rent potential	37 194,78 €	37 589,04 €	37 987,49 €	38 390,15 €	38 797,09 €
Occupation Ratio	85%	90%	95%	95%	95%
Gross Annual Revenue	31 615,56 €	33 830,14 €	36 088,11 €	36 470,65 €	36 857,23 €
Insurance	113,00 €	114,20 €	115,41 €	116,63 €	117,87 €
Fees (IMI)	1 383,00 €	1 383,00 €	1 383,00 €	1 383,00 €	1 383,00 €
Maintenance	100,00 €	101,06 €	102,13 €	103,21 €	104,31 €
Annual Revenue	30 019,56 €	32 231,88 €	34 487,57 €	34 867,80 €	35 252,06 €
Cumulative Annual Revenue	30 019,56 €	62 251,44 €	96 739,01 €	131 606,81 €	166 858,87 €

Table 11 - Annual financial analysis of revenues and costs for Im7 property

	Year 1	Year 2	Year 3	Year 4	Year 5
Annual Gross Rent potential	46 504,34 €	46 997,29 €	47 495,46 €	47 998,91 €	48 507,70 €
Occupation Ratio	85%	90%	95%	95%	95%
Gross Annual Revenue	39 528,69 €	42 297,56 €	45 120,68 €	45 598,96 €	46 082,31 €
Insurance	119,00 €	120,26 €	121,54 €	122,82 €	124,13 €
Fees (IMI)	1 546,74 €	1 546,74 €	1 546,74 €	1 546,74 €	1 546,74 €
Maintenance	100,00 €	101,06 €	102,13 €	103,21 €	104,31 €
Annual Revenue	37 762,95 €	40 529,50 €	43 350,28 €	43 826,18 €	44 307,14 €
Cumulative Annual Revenue	37 762,95 €	78 292,44 €	121 642,72 €	165 468,91 €	209 776,04 €

• Student renting (Op3 and Op5):

Lastly, the type of rental used in the case of real estate operations Op3 and Op5, more precisely in the real estate Im5 and Im8, respectively, is explained. The first case, as presented in section 4.2., is a building that is constructed from the ground up to be specifically a student residence. All its development and construction is based on its future use, which is the renting of 190 housing units for students (20m² each). The second case (Im8), is an apartment that offers the possibility, for being a T3, to rent 4 units for students (3 bedrooms and living room), as is common in other apartments present in the same building.

To determine the amount of rent to be charged per unit, the comparative method was used once again. Five examples of rooms for students with similar characteristics and location were therefore searched for. Then, the mean of the requested rent values of the

identified examples was calculated and this value was defined as the income of the case study units.

After determining the value of rents per unit, the potential annual gross income of each unit was calculated, which corresponds to the monthly rent amount multiplied by only eleven months, which is usual for this type of student lease. Then, by means of the number of units available per property and the expected occupancy rate for these units, which is considerably high due to the scarcity of supply of this type of housing in Lisbon, the gross annual revenue expected for both properties Im5 and Im8. All these calculations can be observed in tables 12 and 13. Finally, as was done for other types of lease, all annual expenditures associated with the use of real estate and total revenues for each of the years of the life cycle studied were calculated, which are presented in tables 12 and 13. It is important to note that all the amounts referred to in this section are updated for all years considered based on the average inflation value of the last ten years (1.06%).

Table 12 – Annual financial analysis of revenues and costs for Im5

	Year 1	Year 2	Year 3	Year 4	Year 5
Renda anual bruta potencial / unidade	5 482,40 €	5 540,52 €	5 599,25 €	5 658,60 €	5 718,58 €
Units Number	190	190	190	190	190
Occupation Rate	80%	90%	95%	95%	95%
Gross Annual Revenue	833 325,52 €	947 428,62 €	1 010 664,22 €	1 021 377,26 €	1 032 203,86 €
Telecommunications	9 702,47 €	9 805,31 €	9 909,25 €	10 014,29 €	10 120,44 €
Water Supply	29 107,40 €	29 415,94 €	29 727,75 €	30 042,86 €	30 361,32 €
Electricity	38 809,87 €	39 221,25 €	39 637,00 €	40 057,15 €	40 481,76 €
Insurance	19 404,93 €	19 610,63 €	19 818,50 €	20 028,58 €	20 240,88 €
Fees (IMI)	4 851,23 €	4 902,66 €	4 954,62 €	5 007,14 €	5 060,22 €
Maintenance	22 738,64 €	22 738,64 €	22 738,64 €	22 738,64 €	22 738,64 €
Annual Revenue	708 710,97 €	821 734,18 €	883 878,45 €	893 488,59 €	903 200,60 €
Cumulative Annual Revenue	708 710,97 €	1 530 445,16 €	2 414 323,61 €	3 307 812,20 €	4 211 012,80 €

Table 13 - Annual financial analysis of revenues and costs for Im8 property

	Year 1	Year 2	Year 3	Year 4	Year 5
Renda anual bruta potencial / unidade	3 718,00 €	3 757,41 €	3 797,24 €	3 837,49 €	3 878,17 €
Units Number	4	4	4	4	4
Occupation Rate	80%	90%	95%	95%	95%
Gross Annual Revenue	11 897,60 €	13 526,68 €	14 429,51 €	14 582,46 €	14 737,04 €
Telecommunications	360,00 €	363,82 €	367,67 €	371,57 €	375,51 €
Water Supply	600,00 €	606,36 €	612,79 €	619,28 €	625,85 €
Electricity	800,00 €	808,48 €	817,05 €	825,71 €	834,46 €
Insurance	68,00 €	68,72 €	69,45 €	70,19 €	70,93 €
Fees (IMI)	405,90 €	410,20 €	414,55 €	418,94 €	423,39 €
Maintenance	2 700,00 €	202,12 €	204,26 €	206,43 €	208,62 €
Annual Revenue	6 963,70 €	11 066,98 €	11 943,74 €	12 070,34 €	12 198,29 €
Cumulative Annual Revenue	6 963,70 €	18 030,68 €	29 974,42 €	42 044,76 €	54 243,04 €

Sales revenues

The share of sales revenues, which is the last of the part of the real estate operations studied, takes on enormous importance due to its obvious and high influence on the success of real estate investments.

The calculation of sales revenue is similar in all properties, except for property Im5 which will be explained later in this section and is based on the use of the comparative method. For this, five properties were searched on the main Portuguese real estate mediation sites, at *Casa Sapo (2019)*, which were located close to the properties analyzed and presented characteristics that were as similar as possible to those of the case studies, in their final state. From the sales price of each of the five examples, an average selling price per square meter was calculated. Multiplying this value by the useful

area of each of the properties studied was determined the current sale value (at the date of the survey) of the same. Next, according to the knowledge gathered in section 4.1 and according to information collected from real estate experts, it was decided to assume that a valuation of 2% per year in the coming years on the sale price of the properties under study.

In relation to property Im5, the calculation of its sale value is different from all other properties. To determine the desired value is used the income method, used in cases where the properties in question have clear periodic income, results of a business, which in this case is the housing business for students. Using three different capitalization rates, which correspond to a pessimistic and optimistic base scenario, three sales figures (expected base sales, optimum expected sales value and expected pessimistic sales value) are calculated for all years of the investment project.

5.2. Investments analysis results

After the presentation of all the parcels that were studied, it is then possible to calculate the annual returns of all the investments analyzed. Again, it is important to note that for each of the properties under study, which are developed within a typical real estate operation, five or six cases were studied that relate to the intended duration of the lease phase. It should also be noted that, other than the acquisition cost, for all the revenues and costs obtained, two other scenarios were calculated in addition to the base scenario resulting from the calculations presented during this chapter: the pessimistic scenario and the optimistic scenario. These scenarios result from a variation of -10% or + 10% in intervention costs and in rental revenues and -5% and + 5% in sales revenues, thus minimizing the errors that may exist in these forecasts.

After determining the plots referred to in the previous paragraph, the initial investment cost and expected gross income (corresponding to the revenues subtracted from the initial investment) were calculated for the three scenarios studied. Based on these values and the total durations determined for each of the different investment projects, the estimated gross annual profitability is calculated for all cases and scenarios considered, which are presented in the table 14.

Table 14 - Expected annual gross return for all case studies.

Cases Studies		Rental Duration	Annual Gross Profitability		
			Pessimist	Base	Optimist
Op 1	Im 1	0 years (case B)	6,5%	20,1%	34,0%
		1 year	6,9%	11,9%	17,1%
		2 years	7,0%	10,4%	13,8%
		3 years	7,1%	9,7%	12,4%
		4 years	7,2%	9,4%	11,6%
	Im 2	0 years (case B)	1,2%	14,2%	27,4%
		1 year	4,1%	8,8%	13,6%
		2 years	4,8%	7,8%	10,9%
		3 years	5,1%	7,4%	9,8%
		4 years	5,2%	7,2%	9,2%
Op 2	Im 3	0 years (case B)	21,1%	28,6%	37,2%
		1 year	17,6%	23,3%	30,0%
		2 years	15,8%	20,7%	26,3%
		3 years	14,8%	19,1%	24,1%
		4 years	14,1%	18,0%	22,6%
	Im 4	0 years (case B)	8,3%	17,2%	27,2%
		1 year	7,0%	12,6%	18,8%
		2 years	6,7%	10,9%	15,6%
		3 years	6,7%	10,1%	14,0%
		4 years	6,6%	9,7%	13,0%
Op 3	Im 5	1 year	13,3%	20,6%	30,1%
		2 years	14,4%	20,9%	29,4%
		3 years	15,2%	21,2%	29,0%
		4 years	14,4%	19,8%	26,7%
		5 years	13,8%	18,7%	25,0%
	Im 6	1 year	4,7%	9,0%	13,3%
		2 years	4,9%	7,6%	10,3%
		3 years	5,1%	7,1%	9,1%
		4 years	5,2%	6,9%	8,6%
		5 years	5,3%	6,8%	8,2%
Im 7	1 year	0,2%	4,3%	8,4%	
	2 years	2,6%	5,2%	7,7%	
	3 years	3,6%	5,6%	7,6%	
	4 years	4,2%	5,9%	7,5%	
	5 years	4,6%	6,1%	7,5%	
Op 4	Im 8	1 year	6,1%	10,5%	14,9%
		2 years	6,1%	8,8%	11,6%
		3 years	6,2%	8,3%	10,4%
		4 years	6,3%	8,0%	9,8%
		5 anos	6,3%	7,9%	9,4%

Annual valuation sensitivity analysis of the realties

Then, due to the high relevance that the valuation of real estate is expected to have in the expected returns of real estate investments, it was decided to conduct a sensitivity analysis of the value chosen for the percentage of annual appreciation of real estate. From the sensitivity analysis performed it can be concluded that the annual valuation percentage acquires a high and almost direct final weight in the expected annual returns, but despite this situation, in the most negative cases, investments, except for Im7, do not present negative profitability values. It is interesting to note that, with regard to this analysis, properties with the highest profitability prospects are not those that show a higher risk.

Duration sensitivity analysis of the investment projects

In addition to the sensitivity analysis performed in the previous paragraph, it was also decided to study the impact of possible variations in the total duration of the investments addressed. The results of this analysis show that a variation of 10% in the total duration of real estate projects has some effect on the annual profitability of each one, but it is not decisive for the success or failure of the investments. It is also observed, as expected, that this variation produces a greater impact in the cases in which the investment presents a higher base annual profitability.

5.3. Analysis of the studied investments counting the influence of the specific factors of the real estate crowdfunding

In this section, once again from some of the fundamental characteristics of real estate crowdfunding investment, presented in section 3.2, and more concretely according to the technical peculiarities of the projects and the characteristics of the platform, we intend to apply the effect of some of the specific variables of the real estate crowdfunding projects in the case studies studied. It intends to incorporate the specific characteristics of the projects launched in collaborative real estate financing platforms, in order to analyze the viability of the same for the investors.

First, ten cases were selected from among all the versions of projects referred to, which relate to the worst and best scenarios of only one property in each of the real estate operations studied, which are presented in table 15.

Table 15 - Scenarios chosen for study.

Cases	Respectively Case Studies		Criteria	Renting Duration
1	Op 1	Im 1	Worst Scenario	5 years
2	Op 1	Im 1	Best Scenario	0 years
3	Op 2	Im 3	Worst Scenario	5 years
4	Op 2	Im 3	Best Scenario	0 years
5	Op 3	Im 5	Worst Scenario	5 years
6	Op 3	Im 5	Best Scenario	3 years
7	Op 4	Im 6	Worst Scenario	5 years
8	Op 4	Im 6	Best Scenario	1 year
9	Op 5	Im 8	Worst SScenario	5 years
10	Op 5	Im 8	Best Scenario	1 year

Then, for each of these cases, we chose the capital structure and the promoter of each of the projects. This choice was based on the analysis that was performed and presented in section 3, assuming the most common situations for each of the cases and can be observed in table 16 which presents the new variables that are considered in the analysis of each one options. It is important to note that in all cases where the external sponsor has some percentage of capital, it will always be the promoter of the project. In all other cases, the developer will be the platform itself.

In addition to the plots defined in the previous paragraph, it was also studied the decisive effect that the different commissions, charged by the platforms of real estate crowdfunding, have on the annual returns of the investors, for the different scenarios. These commissions are defined by each of the platforms and are divided essentially into two types: a direct commission on the amounts invested in the platform; and a fee charged on the income obtained by the same investors. To study the impact of higher or lower amounts of these commissions, for each of the scenarios, three commission options were associated with each scenario: option 1 (high commissions), option 2 (average commissions) and option 3 (reduced fees). Once again, the commissions associated with each of the options defined in table 16 are presented. According to this influence, the expected annual returns to investors were calculated for each of the ten cases under study and for the pessimistic, base and optimistic scenarios of each one presented in table 17.

Table 16 - New variables considered in the analysis of each of the scenarios.

Cases	Capital Structure			Option 1 (High commissions)		Option 2 (Average commissions)		Option 3 (Low commissions)	
	% Investors	% Platform	% Developer	Above investment	Above yields	Above investment	Above yields	Above investment	Above yields
1	100%	0%	0%	3,0%	15,0%	2,0%	10,0%	1,0%	5,0%
2	100%	0%	0%	3,0%	15,0%	2,0%	10,0%	1,0%	5,0%
3	50%	20%	30%	3,0%	15,0%	2,0%	10,0%	1,0%	5,0%
4	50%	20%	30%	3,0%	15,0%	2,0%	10,0%	1,0%	5,0%
5	20%	0%	80%	3,0%	15,0%	2,0%	10,0%	1,0%	5,0%
6	20%	0%	80%	3,0%	15,0%	2,0%	10,0%	1,0%	5,0%
7	80%	20%	0%	3,0%	15,0%	2,0%	10,0%	1,0%	5,0%
8	80%	20%	0%	3,0%	15,0%	2,0%	10,0%	1,0%	5,0%
9	100%	0%	0%	3,0%	15,0%	2,0%	10,0%	1,0%	5,0%
10	100%	0%	0%	3,0%	15,0%	2,0%	10,0%	1,0%	5,0%

Table 17 - Annual returns expected by investors in the different scenarios

Cases	Option 1 (High commissions)			Option 2 (Average commissions)			Option 3 (Low commissions)		
	Investors annual profitability			Investors annual profitability			Investors annual profitability		
	Pessimistic	Base	Optimistic	Pessimistic	Base	Optimistic	Pessimistic	Base	Optimistic
1	6,0%	7,6%	9,2%	6,4%	8,1%	9,9%	6,8%	8,6%	10,5%
2	5,3%	16,5%	28,0%	5,7%	17,7%	30,0%	6,1%	18,9%	32,0%
3	11,2%	14,2%	17,7%	12,0%	15,2%	18,9%	12,8%	16,2%	20,2%
4	17,4%	23,6%	30,7%	18,7%	25,2%	32,8%	19,9%	26,9%	35,0%
5	11,3%	15,4%	20,6%	12,1%	16,5%	22,1%	12,9%	17,6%	23,5%
6	12,5%	17,5%	23,9%	13,4%	18,7%	25,6%	14,3%	20,0%	27,3%
7	4,4%	5,6%	6,8%	4,7%	6,0%	7,2%	5,0%	6,4%	7,7%
8	3,9%	7,4%	11,0%	4,1%	8,0%	11,8%	4,4%	8,5%	12,5%
9	5,2%	6,5%	7,7%	5,6%	6,9%	8,3%	5,9%	7,4%	8,8%
10	5,0%	8,6%	12,3%	5,4%	9,2%	13,1%	5,7%	9,9%	14,0%

Alternative financing models of real estate investments:

A Real Estate Crowdfunding Proposal

Next, it is important to remember that, as presented in section 3.2, one of the technical peculiarities that this type of real estate projects crowdfunding presents is the legal structure of the investments, explained in that section. This structure generally translates into two categories of real estate crowdfunding, which are: equity and loan. In table 18 it is possible to observe the difference between the possible returns for an equity investment, which vary between the pessimistic and the optimistic scenarios of each project, and the fixed returns for the projects based on loans, which correspond to the base scenario. It is important to note that the figures presented relate to the 10 cases referred to throughout this section and to option 2 of average commissions charged by the platforms.

Table 18 - Annual returns obtained by investors (average commissions).

Cases	Case Studies		Annual profitability - "Loan"	Annual profitability - "Equity"	
				Minimum Expected	Maximo Expected
1	Op 1	Im 1	8,1%	6,4%	9,9%
2	Op 1	Im 1	17,7%	5,7%	30,0%
3	Op 2	Im 3	15,2%	12,0%	18,9%
4	Op 2	Im 3	25,2%	18,7%	32,8%
5	Op 3	Im 5	16,5%	12,1%	22,1%
6	Op 3	Im 5	18,7%	13,4%	25,6%
7	Op 4	Im 6	6,0%	4,7%	7,2%
8	Op 4	Im 6	8,0%	4,1%	11,8%
9	Op 5	Im 8	6,9%	5,6%	8,3%
10	Op 5	Im 8	9,2%	5,4%	13,1%
Annual profitability (average)			13,2%	8,8%	18,8%

6. Conclusions

In relation to the real estate operations analyzed, it can be affirmed that the case studies that presented the best results were those related to real estate operations Op1 (acquisition + rehabilitation + short term lease + sale), Op2 (acquisition + new construction + traditional lease + sale) and Op3 (acquisition + new construction + student lease + sale). Within the different parcels involved in the definition of real estate operations, it was firstly concluded that the acquisition value plays a decisive role in obtaining better final returns. As such, the acquisition of properties with values below the market price becomes a great advantage. It is also possible to affirm that the case studies of buildings that underwent a certain intervention, rehabilitation or new construction, were those that proved to be more profitable investments, in particular those that consisted in the construction of a certain building, as an example cases 3, 4, 5 and 6. Regarding the renting process, it can be seen that in cases where there is a possibility of comparing the lease option with the option of not leasing, the first lease option did not present any results better than the second. It was also concluded that, except for the results obtained for the Im7 property, the higher the lease period, the worse the results obtained. Despite this, it is emphasized that, over time, the returns to the pessimistic and optimistic scenarios become closer to that of the base scenario, thereby reducing uncertainty about the expected results. As such and given the decrease in yields with the increase in lease duration, these scenarios may often be preferable because they nevertheless have positive results. In addition to the level of influence mentioned above, it is worth noting that in most cases, the type of lease contributes to the definition of the real estate model itself, and to its success. An example of this situation are cases 5 and 6, referring to

the real estate operation Op3, in which the annual income derived from student lease is used to define the sale price of the property. Finally, the valuation that real estate undergoes over time has also been evaluated. From this analysis it was concluded that the effect that the valuation has on the final returns is almost direct, but at the same time, for the scenario where an annual decrease of 5% in the sale price of the properties was considered, there was only one case, Im7, which obtained negative results.

Regarding the influence of the intrinsic characteristics of the real estate on the results of each of the investment projects, it is concluded that it is quite difficult to affirm with any certainty concrete influence. That is, due to the high indirect effects that these attributes have on other parcels under study, for example, the acquisition values, the sales prices and the amounts of the incomes requested, can not be evaluated from an independent one. Despite this, it can be concluded that the attributes that demonstrate to affect more directly the yields and the final results of the investments, are the real estate area and its location. The effect of the first attribute is observed, for example in the area chosen for the future units of the Im3 property, where the chosen areas are determinant for the maximization of rental revenues and final sales of the units. The influence of location is easily discernible in investments in Im5 and Im8 immovable properties, since the fact that they are located close to university poles is essential to obtain higher occupancy rates as well as to maximize rent values themselves.

As to the specific characteristics of the projects, it is concluded that the project promoter and the capital structure of the projects do not directly affect the final returns for the investors. Despite this, it has a direct influence on the total volume of income generated by all investors and on platform revenues. Regarding the legal structure of investments, the biggest difference lies in the security that investors want for their investments. In the case of loans, profitability is fixed, that is, more secure, whereas in equity investments it is possible to obtain a higher final profitability, but it is also possible that this profitability is lower. An example that demonstrates the volatility of equity investments is case 2, where the variation between the minimum expected and the desired maximum is quite high.

One of the features which has shown to be of considerable relevance is the level of fees charged by the platform, which concerns the scope of the fundamental characteristics of the real estate crowdfunding, but that can influence, for example, the minimum and maximum remunerations established by the platform, which are specific characteristics of the projects. This situation is due to the higher indirect costs that the platform assumes, in the case of investments that are subscribed by a greater number of people. To study specifically the impact that the commissions have on the final returns of the projects, three commissions (high, medium and low) were considered. The first and immediate conclusion is that the application of the platform commissions, which are divided into direct commissions on investments and commissions charged on investor-generated returns, greatly reduce the final returns to investors, as can be seen when comparing the results obtained before and after the application of these rates. Despite this, and even for the option where higher

commissions are applied, all the analyzed cases have proven to be feasible and attractive, allowing to state that it is possible to apply this model of collaborative financing in the Lisbon real estate market (since there is room for commissions without making investment impossible).

It is also worth noting the study that was carried out on the impact that a variation of the total duration of the projects has on the results of the investments. This variation, although having some influence on the results, is not decisive in changing the level of success of investments. It is also possible to observe cases of high total durations, cases of considerable returns (cases 3,4,5 and 6), cases of shorter durations and cases with very positive results (cases 2 and 10). Nevertheless, it can be concluded that projects with longer durations show a lower risk.

Finally, it is important to note that for the ten final scenarios studied the average annual returns calculated were 13.2% for loans and a range of values from 8.8% to 18.8% % for equity investments. Based on these values, it is concluded that this type of collaborative investments is quite competitive when compared to the results that the most common financial products enunciate. It is also concluded that, overall, the profitability values of all scenarios are also higher than these more common products and still demonstrate a lower level of risk when compared with investments of similar yields.

REFERENCES

- [1] J. Carvalho das Neves, J. Montezuma, and A. Laia, *Análise de Investimentos Imobiliários*. 2009.
- [2] I. Woychuk, "www.investopedia.com." 2018.
- [3] A. Delivorias, "Crowdfunding in Europe," 2017.
- [4] A. Brochado, "Snapshot da Indústria do Crowdfunding na Europa," *Cadernos do Mercado de Valores Mobiliários - nº57*. CMVM, pp. 37–60, 2017.
- [5] H. Forbes and D. Schaefer, "Guidelines for Successful Crowdfunding," *Procedia CIRP*, vol. 60, pp. 398–403, 2017.
- [6] CCAF, "Expanding Horizons," 2018.
- [7] S. Maarbani, "Real Estate Crowdfunding," p. 39, 2015.
- [8] F. I. Marchand, "Crowdfunding Real Estate : Institutions and Markets," 2016.
- [9] N. Montgomery, G. Squires, and I. Syed, "Disruptive potential of real estate crowdfunding in the real estate project finance industry," *Prop. Manag.*, p. PM-04-2018-0032, 2018.
- [10] D. Schweizer and T. Zhou, "Do Principles Pay in Real Estate Crowdfunding?," *Ssm*, 2016.
- [11] J. Cohen, "A Study on the History and Functionality of Real Estate Crowdfunding," *Joseph Whart. Sch.*, pp. 1–43, 2016.
- [12] B. O'Roarty, "Real Estate Crowdfunding : Gimmick or Game Changer?," no. November 2016, 2016.
- [13] T. Schneider, "Young professionals' 2016," no. June. 2016.