The Usufruct Right as an Effective Strategy for the Enhancement of Properties in Disuse

Marco Locurcio[1](✉), Pierluigi Morano[1], Francesco Tajani[2], and Rossana Ranieri[2]

[1] Department of Civil, Environmental, Land, Building Engineering and Chemistry (DICATECh), Polytechnic University of Bari, 70126 Bari, Italy
marco.locurcio@poliba.it

[2] Department of Architecture and Design, "Sapienza" University of Rome, 00196 Rome, Italy

Abstract. The aim of the present research is to highlight the central role of the usufruct right in the context of property valuations, in particular with reference to the need of supporting the Public Administration (PA) in the proper definition of effective strategies in order to achieve its real estate objectives while containing financial exposure. Often, public properties are owned by entities that do not have the skills and the spending capacity required for their enhancement, which causes the progressive degradation of the assets with a negative impact on the entire territory in which they are located. Such assets, even when placed in the market for sale, frequently do not attract the interest of market operators due to the constraints and the generally high costs of renovation. PAs, which are interested in the enhancement of their properties, in the positive effects on the surrounding areas and in the benefits to the population, do not have the resources necessary to bear the costs of redevelopment. The case study developed in this research, concerning the valuation of the usufruct right of a building in disuse located in a municipality in Southern Italy, is an opportunity to highlight the potential of this strategy.

Keywords: usufruct · bare ownership · property enhancement · market value · net present value

1 Introduction

Public administrations (PAs) have the need to enhance portions of their real estate assets in order to meet the needs of the community [1]. This need clashes with the scarcity of resources to be allocated to such operations, especially in cases where the PA interested in the valorization of the asset is not the owner because to the considerable costs of valorization and renovation, should also add the amount necessary to acquire ownership of the asset. To contain the acquisition costs associated with the full ownership of an asset, it is possible to take possession of property rights, which still enable the PA to achieve its goals over a medium/long-term horizon and to access the many financing opportunities provided [2]. Specifically, in the Italian legislative framework, it is possible to split ownership into two complementary property rights, namely, usufruct and bare

© The Author(s), under exclusive license to Springer Nature Switzerland AG 2023
O. Gervasi et al. (Eds.): ICCSA 2023 Workshops, LNCS 14109, pp. 497–509, 2023.
https://doi.org/10.1007/978-3-031-37120-2_32

ownership. This allows the usufructuary to enjoy possession of an asset for a specific time horizon, and the bare owner to regain possession of the asset when the usufruct expires; in this sense the usufructuary has to pay the bare owner a monetary amount that restores from the temporary lack of ownership of the asset for the stipulated amount of time. The ownership value, i.e., the market value, is divided into two complementary monetary amounts corresponding to the usufruct and bare ownership rights, which allow the usufructuary to contain the financial exposure in the face of certain limitations, and the bare owner to receive a monetary amount for an asset deemed non-strategic with respect to its purposes.

The objective of this paper is to highlight the central role of the usufruct right in the context of real estate development initiatives, and the importance of supporting the PA in the proper definition of strategies to achieve its goals while containing financial exposure. The case study, concerning the estimation of the usufruct right of a building in disuse located in a municipality in Southern Italy, is an opportunity to highlight the potential of such a strategy.

2 The Usufruct Right

2.1 Legislative Framework

Usufruct is a property right originated in the law of Roman legislative framework of the classical period, found in the legal system of many European (Italy, France, Spain, Germany, etc.), American (USA, Cuba, Guatemala, etc.), Asian (China, Philippines, Thailand, etc.) and African (Ghana, etc.) countries [3, 4]. The analysis of the current literature shows that most of the researches focus on the legal aspects of the partial rights of bare ownership [5–7], and on studies about the methodological and financial issues of the related estimation models [8, 9]. The present research does not focus specifically on the legal or estimation aspects of the usufruct right, but it is aimed in describing the use of this approach as a way to support the enhancement of public properties in contexts characterized by scarcity of resources.

In Italy, usufruct is regulated by Articles 978 et seq. of the Civil Code [10] and consists of the right of a subject (usufructuary) to enjoy a property owned by another subject (bare owner) and to obtain the benefits by applying the diligence of the "good family man" in the management of the property. The usufruct is always temporary and has a duration not exceeding the life of the usufructuary, if the usufructuary is a person, or 30 years, if the usufruct is established in favor of a legal entity. The usufructuary has the right to enjoy the property, but its economic purpose should be respected, and the change of intended use is not allowed. However, the usufructuary could make improvements that do not alter the main use and that should be removed at the end of the right, if this does not damage the property. If this is not possible, the usufructuary is entitled to an indemnity at the time he/she returns the property, equal to the lesser of the amount of the expenditure and the increase in value associated with the improvements. Expenses and, in general, charges related to the custody, administration and ordinary maintenance of the property shall be borne by the usufructuary; extraordinary repairs necessitated by failure to fulfill the obligations of ordinary maintenance shall also be charged by the usufructuary, while extraordinary repairs are up to the owner.

The usufruct is extinguished in the following cases: *i)* by reaching the stipulated term; *ii)* in case of non-use of the property for continuous 20 years; *iii)* by the unification of the usufruct in the same person; *iv)* by the total perishing of the property; *v)* by abuse of the usufructuary.

2.2 Possible Evaluation Approaches

At the time when the right of usufruct occurs, full ownership ceases to exist and usufruct and bare ownership are associated with two different stakeholders, whether natural or legal persons, are created. For estimating the value of usufruct right, i.e., the amount that the usufructuary has to pay to the bare owner to purchase the right of usufruct, it is possible to consider two different approaches: *i)* the one indicated by the "Consolidated Text of Provisions Concerning Registration Tax" [11]; *ii)* the valuation best practices indicates by Appraisal reference. The first approach is designed to determine the tax base to be used for tax purposes, while the second is borrowed from market rationality.

The approach used in this paper refers to valuation practices on usufruct, and the provisions of the Consolidated Act of Provisions Concerning Registration Tax will be only used for comparison purposes. According to estimative best practices, the value of the usufruct right (V_U), is the Net Present Value (NPV) associated with the net cash flows of the usufructuary, in formulas:

$$NPV = \sum_{t=1}^{n} \left[\frac{R}{(1+i)^t} \right] - \left[\frac{C}{(1+i)^t} \right] \tag{1}$$

where R and C are respectively the revenues and costs in the hands of the usufructuary, i the discount rate, t the time point at which the revenues and costs occur, and n the duration of the usufruct right.

Essentially, net income, limited by the duration of the usufruct right, could be equated with a hypothetical rent whose duration is precisely the duration of the usufruct right. Otherwise, it is possible to determine the net income associated with the specific person who will use the property according to the current economic use; this option is scarcely used in valuation practices, because the determination of costs and revenues of the actual user, instead of the rent, makes compliance with the principle of ordinariness more complicated, and it is easy to switch from a generally valid appraisal judgment to a specifically valid one of economic convenience. For these reasons, it is preferred to discern the purely real estate component from that associated with management.

The discount rate, which is necessary to carry forward to the valuation date the amounts that occur over the life of the usufruct, is determined according to market logic and thus by means of the Weighted Average Cost of Capital (WACC). The WACC represents the average cost of capital weighted compared to the two financial coverage components of capital employed, namely debt [12] and equity. The formula for determining the discount rate using WACC is:

$$WACC = k_E \cdot E + k_D \cdot D \tag{2}$$

where k_E and k_D are the cost of equity and debt, respectively, and E and D are the percentage of equity and debt capital. To estimate k_E, the Capital Asset Pricing Model

(CAPM) can be applied by applying the following formula:

$$k_E = R_f + \beta\left(R_m - R_f\right) \tag{3}$$

where R_f is a risk-free yield, β is a coefficient that measures the responsiveness of the yield to movements in the reference market, and R_m is the yield associated with the specific reference market. For the determination of k_D, it is possible to consider the cost of financing obtainable by placing the property or, as in the present case, the usufruct right as collateral.

3 Case Study

In order to highlight the limitations and potential of splitting full ownership into usufruct and bare ownership as a strategy for facilitating property enhancement, in accordance with what has been previously illustrated, the assessment of the usufruct right related to a property in disuse has been carried out. This case study takes into account the need of a PA to use a property for a period of 20 years, in order to intercept a public financing provided for the enhancement of this type of asset; this objective collided the PA's inability to obtain full ownership of the property due to both a lack of resources to allocate and the owner's will to maintain the property right, despite the fact that the asset was not strategic with respect to its medium/long-term objectives. The mutual requirements have taken the form of the 20-year usufruct in favor of the PA, the monetary consideration for which has been assumed to be paid in 20 annual down payments in favor of the bare owner, given the inability of the entity interested in managing the property to pay the total amount in one lump sum.

3.1 Description of the Property and the Context

The property is located on the peripheral area of a Southern Italian municipality, in a strategic location, less than one kilometer from the city center, 400 m from the train station, and in close proximity to an outpatient clinic in which there are several services (cardiology, general surgery, endocrinology, geriatrics, internal medicine, nephrology, neurology, and the blood draw center). The property consists of (i) a main building originally used as a kindergarten; (ii) a secondary building used as a garage; (iii) an enclosed area used as a courtyard within which the two buildings are located; (iv) an adjacent pine forest. The extrinsic-positional and intrinsic characteristics of the property seem to be responsive to the needs expressed by the PA in question, seeking a building to be used for the specialized accommodation of the over-65 population.

The main building, accessed by 3 entrances, consists of 1 basement and 3 floors connected by a stairwell and elevator. Also, the main building and the secondary building have been built presumably in 1960–1970 and consist of a reinforced concrete structure and curtain wall cladding with face brick. Over the years there have been interventions aimed at partially replacing part of the flooring, changing the articulation of the interior rooms, and introducing the elevator. The building was used in its original function until the early 2000s, then it was occasionally used by the ownership for recreational and

hospitality activities until 2013. Currently, the property is in a state of neglect and has been subject to vandalism and theft. The main building and the secondary building have a total gross internal area of about 2,700 m^2; the total area of the lot is about 4,800 m^2 of which 900 m^2 are covered and the residual occupied by the courtyard and pine forest.

3.2 Identification of the Economic Purpose of the Asset

In order to proceed with the assessment of the value of the usufruct right, it is necessary to identify the economic destination of the property, which must remain unchanged throughout the duration of the usufruct and compatible at the same time with the urban zoning of the area, the stacking of the buildings, the specificities of the building and with the needs of the reference real estate market, as expressed by the PA interested in purchasing the usufruct right. Based on the analysis of these elements, it has been considered that the property lends itself to becoming a "*senior accommodation"* in which: (i) the basement floor of the main building can house the service rooms (kitchen, dining room, kitchenette, laundry, linen storage); (ii) on the *mezzanine* floor, it is possible to develop the common rooms for recreation and leisure activities, gymnasium, a bar room, infirmary, management, administrative employee offices, staff service room with attached toilets, and guardhouse; (iii) related to the *mezzanine*, first and second floors, a total of 37 rooms are planned, including 10 single and 27 double rooms, for a total of 64 guests.

The outline hypothesis of space re-functionalization (see Fig. 1) has been conceived with the view that the facility aims to provide long-term care and maintenance services, including rehabilitation services, delivered to non-self-sufficient patients with low need for health care protection, ensuring the achievement of appropriate scale economies. In addition to being compatible with stacking, urban planning requirements and technically feasible, the hypothesized intended use must be economically viable; therefore, the last step in identifying the economic intended use of the asset consists of the analysis of the target market i.e., the supply/demand ratio and their respective prospective evolution. The potential demand has been identified in the population over 65 residing in the reference province, while the supply consists of the similar facilities currently present.

In Italy, the life expectancy is 83.6 years, which is higher than the OECD average (equal to 81 years) [13] and, based on the analysis of the age pyramid relative to the next 20 years (see Fig. 2), against a decrease in the resident population in Italy of 6%, an increase in the over-65s of 37% is expected, thus a potential increase in the elderly in need of care. Currently in our country, the demand for long term care appears to be largely unmet, the number of beds allocated for long-term care of the over 65s is among the lowest in Europe as is the investment in such facilities. Therefore, the use of "*senior accomodation*" represents a possible new use for the property in line with the concept of economic destination of an asset suitable to usufruct.

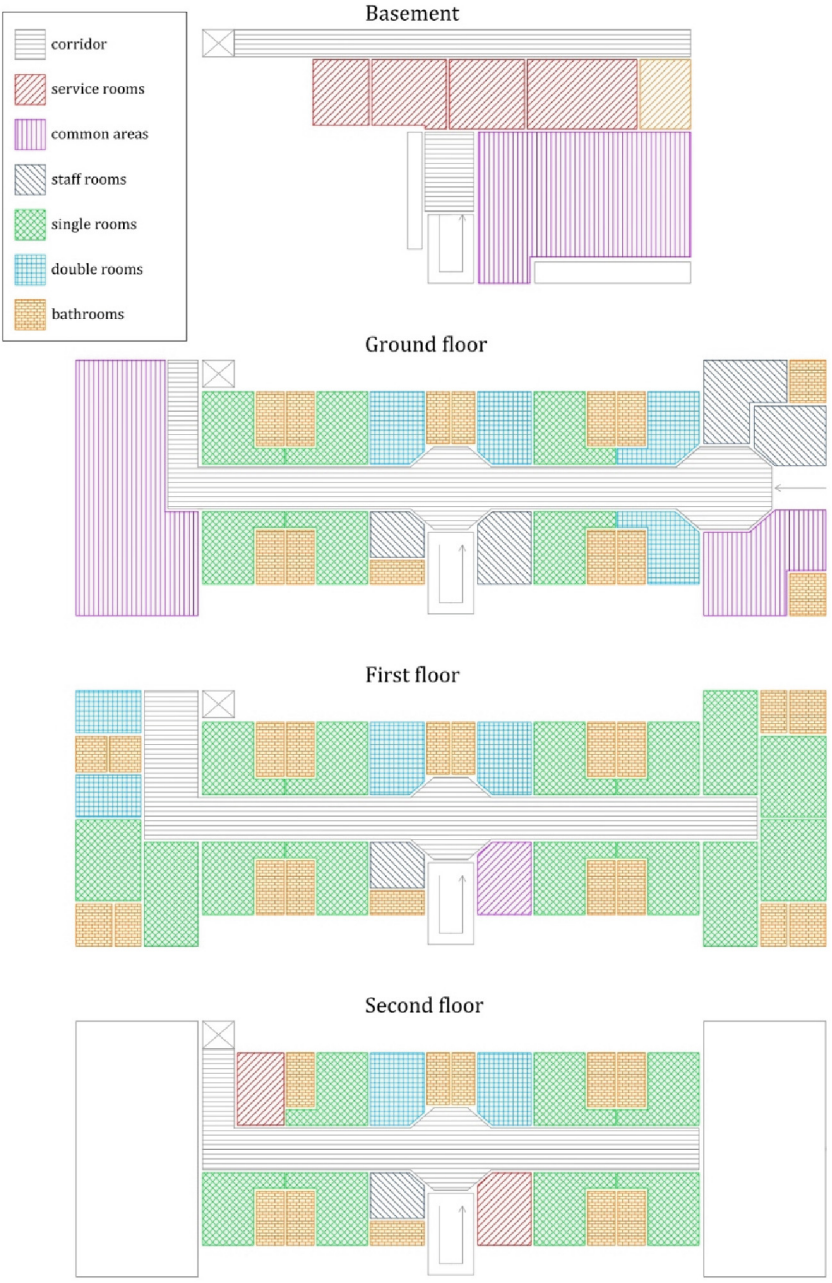

Fig. 1. Outline hypothesis of the re-functionalization of spaces.

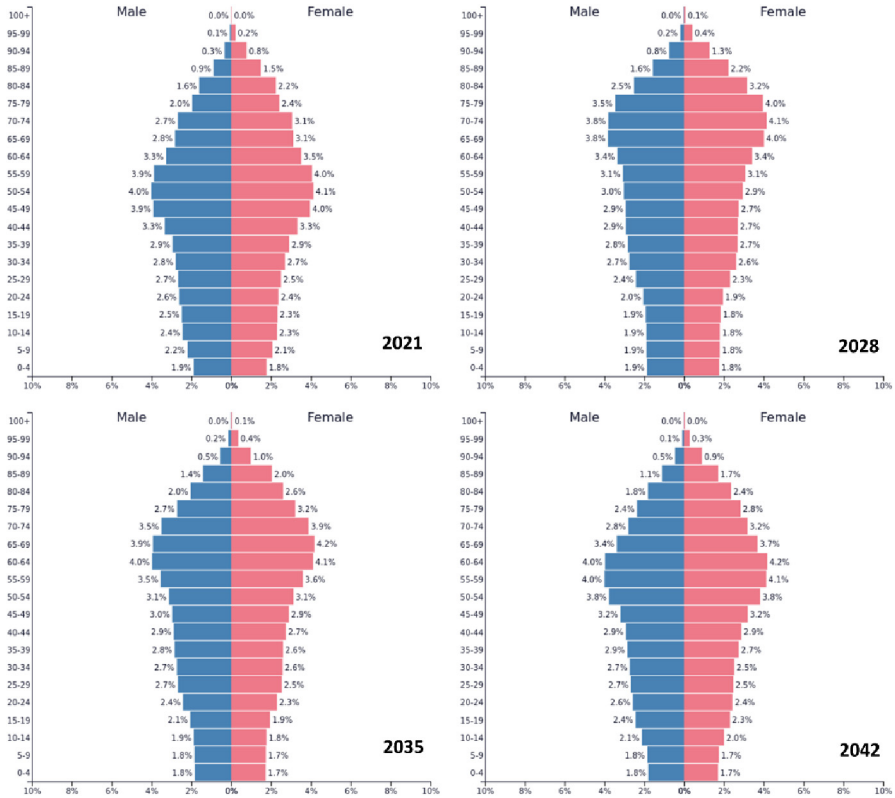

Fig. 2. Age pyramid of the Italian population processed by PopulationPyramid.net on data from United Nations, Department of Economic and Social Affairs, Population Division.

3.3 Determination of the Usufruct Right's Value

To assess the value of the usufruct right, it is necessary to define the stakeholder involved in the transaction:

- the bare owner, who receives from the usufructuary an annual payment for the duration of 20 years equivalent to the corresponding value of usufruct right for 20 years;
- the usufructuary, who pays the above amount to the bare owner and receives from a tenant a rent for the period of time between the end of the renovation work and the end of the term of the usufruct right;
- the hypothetical lessee, who pays the usufructuary the above rent and takes care of the management of the senior accommodation by making a profit.

Given the poor state of maintenance of the property and its original use, it is necessary to provide renovation works to enhance the value of the property; in light of the usufruct law, it is reasonable to assume that the usufructuary will bear the necessary costs for the improvement of the property by receiving a reimbursement at the term of the usufruct from the bare owner, equal to the costs incurred.

In estimating the value of the usufructuary right, there is a full complementarity between usufruct and bare ownership, which together constitute the value of full ownership, namely:

$$V_P = V_U + V_N \tag{4}$$

where V_P is the value of full ownership, equal to the market value of the property, V_U is the value of the usufruct right, and V_N is the value of bare ownership. In order to verify compliance with the above equation, V_P and V_N have been also determined in addition to V_U. V_P e V_N that have been estimated by indirect procedure, similar to what done for the value of the usufruct right, by applying a Discounted Cash Flow Analysis (DCFA) constructed with reference to the expected cash flows from the hypothetical owner of the property and the bare owner, respectively.

In the case of estimating the value of full ownership, the income in the hands of the owner will be the sustainable rent, which the hypothetical tenant should pay to the owner, and the terminal value, which is the residual value of the property at the end of the analysis period (which for consistency of approach is assumed to be 20 years). The terminal value is determined through a direct capitalization of the rent received at the last analysis period by applying a gross cap rate equal to 5.5%, which is consistent with yields found in the market for similar structures. The costs to be borne by the owner will be the same as for the usufructuary, to which provisions for extraordinary maintenance are added. These quantities, although they do not constitute actual cash outlays, represent provisions that the owner makes by virtue of hypothetical extraordinary maintenance work that will be performed over the years and are set equal to 1% of the cost of reconstruction to new (CRN).

In the case of estimating the value of the bare ownership, the terminal value is the only income in the hands of the bare owner, relative to the end of the analysis period, cleared of the costs for extraordinary maintenance that he/she will have to reimburse the usufructuary.

With regard to the technical parameters identified, the valuation is developed under current prices, assuming the evolution over time of the quantities involved (sustainable rent, prices, revenues, maintenance costs, etc.) due to the prospective trend of monthly changes in the consumer price index for blue and white-collar families (FOI) as measured by ISTAT [14]. For this purpose, the variability of the FOI index has been analyzed (see Fig. 3) from which a 2% inflation trend growth can be conservatively assumed. Rent has been indexed to 75% of the FOI index, and prices and costs to 100% of the FOI index.

Regarding the other technical parameters, the following assumptions have been applied to the analysis. The discount rate has been determined through the WACC approach, identifying the European β for the Real Estate - Development sector published by Professor Damodaran [15], the market risk (R_m) equal to the sum of the Return On Equity (ROE) of the Real Estate - Development sector and an increase function of the specificities of the real estate initiative (ΔR_m), while the risk free R_f is equal to the gross yield of the 15-year BTPs [16] placed on July 13–14, 2022; the k_D is given by the sum of the yield of the 20-year EURIRS [17] (17/08/2022) and the adjusted default spread for Italy.

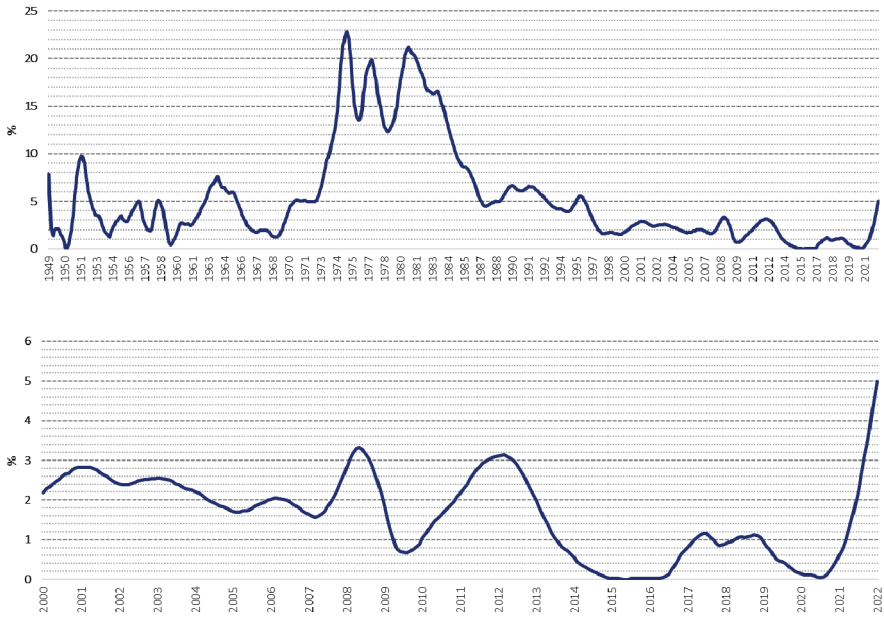

Fig. 3. Annual moving average (on a monthly basis) of changes in the FOI-ISTAT index for the periods 1949–2022 and 2000–2022. Elaborations made by setting negative values equal to zero.

Depending on the appraised value (usufruct, full ownership, and bare ownership) and thus the point of view from which the cash flows are constructed (usufructuary, owner, and bare owner) ΔR_m is going to vary. The owner assumes all the risks of the transaction and therefore is expected to have a higher return on equity, as opposed to the bare owner to whom a lower risk profile, and therefore return, corresponds. The usufructuary is in an intermediate position, although he/she has to burden the costs of extraordinary maintenance, like the owner, that has the expectation of returning these amounts at the end of the usufruct. Another parameter that distinguishes the different profiles is the equity/debt ratio, set equal to 50%/50%, in the case of usufructuary and bare owner, because of the limitations they have compared to the owner, for whom it can be assumed a greater bank exposure and thus in equity/debt ratio equal to 40%/60%. Table 1 shows the parameters used and the rates obtained; the usufructuary's discount rate turns out to be the highest precisely because of the high extraordinary maintenance costs it has to incur in the 2 years following the establishment of the usufruct right, and the uncertainties about future revenues; the owner, although has to incur the same costs, has revenue prospects that do not end after 20 years and could have a higher Loan To Value (LTV), having a slightly lower rate than the usufructuary; finally, the bare owner has an even lower rate resulting from the lower risks incurred.

Table 1. Estimation of the discount rate

Parameters	Usufruct	Full ownership	Bare ownership
β	0.81	0.81	0.81
ROE	10.48%	10.48%	10.48%
ΔRm	3.00%	5.00%	2.00%
Rm	13.48%	15.48%	12.48%
BTP	3.45%	3.45%	3.45%
K_E	11.54%	13.15%	10.73%
spread	1.87%	1.87%	1.87%
EURIRS	1.94%	1.94%	1.94%
K_D	3.81%	3.81%	3.81%
E	50%	40%	50%
D	50%	60%	50%
WACC	**7.68%**	**7.55%**	**7.27%**

The costs charged to the usufructuary, according to the evaluation approach described, are:

- extraordinary maintenance;
- routine maintenance;
- insurance premium;
- property tax [18];
- administrative management;
- registration tax.

The assessment of unit costs associated with the extraordinary maintenance and the CRN has been carried out by means of parametric costs related to recurring building types [19] adjusted according to the differences in workmanship, geography [20] and time [21] existing between the type sheets and the specifics of the case under consideration. Technical (design, construction management, testing, etc.) and general (operation preparation, consulting, secretariat. etc.) expenses have been added to the construction costs.

In summary: the extraordinary maintenance operation has a total estimated cost of about € 3,135,000, corresponding to a unit cost of 1,173 €/m^2 and a cost per room of 77,604 €/room; the CRN is about € 4,670,000, corresponding to a unit cost of 1,746 €/m^2 and a cost per room of 126,177 €/room; the property tax is 10,756 €/year [22]. Administrative management costs are assumed to be 1.5% of the rent, while the registration tax is set at 2% of the rent; these amounts will fluctuate over time depending on the indexation of the rent.

The revenues in the hands of the usufructuary are the sustainable rents, which the hypothetical tenant pays until the end of the usufruct, and the reimbursement for maintenance expenses incurred, which the bare owner will pay to the usufructuary at the end of the usufruct right.

In determining the sustainable rent that the manager of the nursing home pays to the usufructuary, it is necessary to reconstruct the costs and revenues of the initiative. The sustainable rent, in line with valuation best practices, is assumed to be 25 percent of gross management revenue, obtained by considering a room rate of 60 €/day for single rooms and 100 €/day for double rooms, determined based on analyses of the tariffs of similar facilities in the surrounding area. Given the low vacancy associated with these facilities, an average annual occupancy of 95% has been assumed; total revenue, i.e., gross revenue, is given by the sum of room revenue and ancillary revenue (bar management, vending machines, etc.) equal to 5% of room revenue.

In order to verify that the profit of the nursing home operator is consistent with the expectations of the stakeholder, the costs of operation have been parametrically determined [23]. The sustainable rent in fully operational condition is equal to 300,000 €/year, which corresponds to an Estimated Rental Value (ERV) of 110 €/m^2; the profit of the nursing home operator is about 200,000 €/year, i.e. 17% of the total estimated turnover.

It is assumed that after the conclusion of the enhancement workings, there is a lease contract between the usufructuary and the manager of the facility with a duration of 9 + 9 years, indexed to 75% of the previously estimated FOI-ISTAT index; in order to facilitate the manager in starting the business, it is assumed that the usufructuary grants the tenant a step rent of the first 2 periods (1st period 60% of the sustainable rent and 2nd period 80% of the sustainable rent).

Reimbursement of extraordinary maintenance expenses without interest at the end of the usufruct is paid in the 20th year by the bare owner in favor of the usufructuary.

As described in the introduction, the parties have agreed that the value of the usufruct right is not paid in a single tranche at the time of establishment of the right in favor of the usufructuary, but in 20 equal annual down payments compensated by the usufructuary to the bare owner at the beginning of each period. Following the estimation of the value of the usufruct right, it is then necessary to divide this amount into 20 constant annual payments in advance as they are given at the beginning of each period; the value of the usufruct right is equivalent to the initial accumulation A_0 (as of the valuation date) of the 20 annual payments (r) previously defined, in formulas:

$$A_0 = r \cdot q \frac{q^{20} - 1}{q^{20} \cdot s} = r \cdot \frac{q^{20} - 1}{q^{19} \cdot s} \tag{5}$$

where $q = 1 + s$ is the unit amount and s is the interest rate. In the present case, given the initial accumulation equal to the value of the estimated usufruct right ($A_0 = V_U$), the annual installment is equal to:

$$r = \frac{V_U \cdot q^{19} \cdot s}{q^{20} - 1} \tag{6}$$

The interest rate s is equated to a risk free rate set equal to the gross yield on 15-year BTPs as placed on July 13–14, 2022, which is equal to 3.45%.

The value of the usufruct right with a 20-year term, relating to the subject property, determined as of 08/31/2022 is equal to € 302,000 corresponding to an equivalent annual down payment of € 20,448.

The value of the full ownership determined as of 08/31/2022 is equal to € 779,000, corresponding to a unit value with respect to the commercial area of 284 €/m^2; the value of the bare ownership is equal to € 481,000; the sum of the values of usufruct and bare ownership is equal to € 783,000, which is € 4,000 higher than the value of the full ownership (+0.51%); this difference appears negligible and attributable to the different approximations used.

4 Conclusions

The present research, applied to a concrete case, has shown that the usufruct right could take a central role in property development initiatives, especially when there are several stakeholders with different interests; in fact, properties of public value are often owned by entities who do not have the interest and spending capacity necessary to develop them, and this causes the progressive degradation of the assets with a consequent negative impact on the entire territory in which they are located. Such assets, even when offered for sale, often do not attract the interest of market operators, due to the current constraints and the high costs of renovation. PAs, which are interested in the enhancement of the properties and the positive effects on the surrounding areas and the benefits to the population, do not have the resources necessary to purchase full ownership and to bear the costs of redevelopment. The usufruct right makes it possible to overcome this situation since it permits the usufructuary to: *i)* be able to enjoy the asset for a period of time necessary for the enhancement of the asset; *ii)* have the ownership of a real property right necessary to access possible public financing; *iii)* contain the initial costs since the monetary consideration to be paid for the possession of the usufruct right is less than the market value of the asset. The bare owner, on the other hand, obtains: *i)* a monetary amount without depriving himself of ownership of the asset; *ii)* containment of costs associated with maintenance of the asset. The proposed approach could be extended in many different contexts characterized by public properties to be enhanced missing resources [24].

Note
The research has been developed within the project “MISTRAL - a toolkit for dynaMic health Impact analysiS to predicT disability-Related costs in the Aging population based on three case studies of steeL-industry exposed areas in Europe”- HORIZON-HLTH-2022-ENVHLTH04 - Grant Agreement Project n. 101095119 of the Polytechnic University of Bari (Italy).

References

1. Anelli, D., Tajani, F.: Valorization of cultural heritage and land take reduction: an urban compensation model for the replacement of unsuitable buildings in an Italian UNESCO site. J. Cult. Herit. **57**, 165–172 (2022)

2. NextGenerationEU. https://next-generation-eu.europa.eu/index_en. Accessed 09 Feb 2023
3. Pereña Vicente, M.: La constitución voluntaria del usufructo. Ciencias jurídicas y Sociales **32** (2005)
4. Morano, P., Tajani, F.: Estimative analysis of a segment of the bare ownership market of residential property. In: Computational Science and Its Applications – ICCSA 2013. ICCSA 2013. LNCS, vol. 7974. Springer, Berlin (2013). https://doi.org/10.1007/978-3-642-39649-6_31
5. LeVan, G.: The usufructuary's obligation to preserve the property. Lousiana Law Rev. **22**(4), 808–818 (1962)
6. Yiannopoulos, A.N.: Usufruct: general principles Louisiana and comparative law. Louisiana Law Rev. **27**(3), 369–422 (1966)
7. Christensen, H.: International Estate Planning, 2nd edn., LexisNexis, Conklin (2013)
8. Brueggeman, W.B., Fisher, J.D.: Real Estate Finance and Investments, 13th edn. McGraw-Hill International, Boston (2008)
9. Morano, P., Tajani, F.: Bare ownership of residential properties: insights on two segments of the Italian market, Int. J. Hous. Mark. Anal. **9**(3), 376–399 (2016)
10. The Italian Civil Code (Testo del Regio Decreto 16 marzo 1942, n. 262 and D.Lgs. 10 ottobre 2022, n. 149)
11. Consolidated Text of Provisions Concerning Registration Tax (26 april 1986 n. 131)
12. Locurcio, M., Tajani, F., Morano, P., Anelli, D., Manganelli, B.: Credit risk management of property investments through multi-criteria indicators, Risks **9**(6), 106 (2021)
13. OECD: Health at a Glance 2021: OECD Indicators, OECD Publishing, Paris (2021)
14. ISTAT FOI. https://www.istat.it/it/archivio/FOI. Accessed 09 Feb 2023
15. Damodaran, A. https://pages.stern.nyu.edu/~adamodar/New_Home_Page/datacurrent.html. Accessed 9 Feb 2023
16. BTP. https://www.dt.mef.gov.it/it/debito_pubblico/emissioni_titoli_di_stato_interni/risultati_aste. Accessed 9 Feb 2023
17. EURIRS. https://mutuionline.24oreborsaonline.ilsole24ore.com/guide-mutui/irs.asp, Accessed 9 Feb 2023
18. Tajani, F., Morano, P., Torre C.M., di Liddo F.: An analysis of the influence of property tax on housing prices in the Apulia Region (Italy), Buildings **7**(3), 67 (2017)
19. Collegio degli Ingegneri e Architetti di Milano: Prezzi tipologie edilizie, DEI – Tipografia del Genio Civile, Milano (2019)
20. Manganelli B.: Il deprezzamento degli immobili urbani, Franco Angeli, Milano (2011)
21. Bianca M., C.: Diritto Civile – la proprietà, Giuffrè Editore, Milano (2016)
22. Amministrazioni Comunali. https://www.amministrazionicomunali.it/main/. Accessed 9 Feb 2023
23. Unione nazionale istituzioni e iniziative di assistenza sociale. I costi e i ricavi nelle RSA: come renderli più efficienti. 26 ottobre 2010. https://www.uneba.org/i-costi-e-i-ricavi-nelle-rsa-come-renderli-pi-efficienti/. Accessed 9 Feb 2023
24. Morano, P., Tajani, F., Di Liddo, F., La Spina, I.: The evaluation in the urban projects planning: a logical-deductive model for the definition of "warning areas" in the Esquilino District in the City of Rome (Italy). Smart Cities **6**(1), 469–490 (2023)