Healthcare Investments Valuation. A Case Study of a Property in Disuse to Be Enhanced in a Nursing Home

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Abstract. Italy is increasingly becoming an aging nation. According to the national Institute of Statistics, nearly one in four individuals is over the age of 65, and by 2050, it is estimated that this demographic trend could constitute 35% of the population. This aging also brings with it an increase in the number of people who are not self-sufficient. Currently, there are approximately 4 million individuals in Italy with a severe reduction in autonomy in daily activities, and of these, 92% live at home. The lack of care provision for an aging population has been considered a significant opportunity by the real estate market. The sector of Residential Healthcare Facilities (RHFs), in fact, is emerging as one of the most promising, and it is also beginning to attract increasing interest from investors in Italy seeking attractive returns. This research aims to analyze the main aspects related to the RHF sector. In this sense, an economic evaluation case study is presented, concerning the enhancement of a nursing home located in the Friuli Venezia Giulia region (Italy).

Keywords: Healthcare · DCFA · Health Facilities · Property Investment · Nursing Home

1 Introduction

The improvements in living conditions, due to discoveries in the scientific-health field, the increase in life expectancy, which has grown at different rates depending on the regions of the world, and the decline in the birth rate, together with the role played by the change in the value system in the last decades of the last century, have led to a gradual and progressive aging of the population. This process presents different intensities depending on the regions of the world, being particularly advanced in Europe and America [1]. In 2022, worldwide, there were 771 million people aged 65 or older,

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representing about 10% of the world's population. This percentage is set to more than double in the next eighty years, when those over 65 will constitute 24% of the world's population [2]. In Italy, the life expectancy in 1880 was 35.4 years. However, over the course of our country's history, life expectancy has seen a significant increase: in 1900 it rose to 42.8 years [3] to reach 83 years for men and 86 years for women today [4]. Italy ranks among the top countries for life expectancy at birth, but it is at the bottom of the list for its ability to provide long-term care for its elderly.

This situation will have a significant impact on social protection policies, which will have to address the needs of an increasing number of elderly people. This issue has been further highlighted by the emergency related to the spread of the Covid-19 epidemic, which has highlighted some critical issues that characterize the Italian socio-health sector, in particular residential facilities for the elderly [5]. Although the Covid-19 pandemic has played a role in emphasizing the critical elements of the sector, it has allowed for a collective debate on services for the elderly, especially residential ones, and on the necessary changes and investments [6–8].

In this context, the sector of Residential Healthcare Facilities (RHFs) is emerging as one of the most promising and, also in Italy, is attracting more and more interest from investors looking for interesting returns and countercyclical operations.

2 Aim

This research aims to analyse the main aspects related to the RHF sector. The focus is represented by the observation of the demographic change that will result in a decrease of 9.1 million people under the age of 65 and a parallel increase of 4.6 million people over the age of 65 [9]. On the other hand, the lack of care provision for an aging population has been considered a great opportunity by the real estate market. In this sense, an economic evaluation case study is presented, in order to highlight the most significant aspects regarding the management of RHF initiatives by relating cost items and revenues, focusing on a business plan that is decisive in the return on investment for the private operator.

The work is articulated as follows. In Sect. 3, an overview of the RHFs is presented, examining the demand and the supply, the regional fragmentation that impacts the costs and the tariffs in the RHFs, and the possible future scenarios. In Sect. 4, a case study of a disused building located in Friuli Venezia Giulia (Italy) is illustrated, and a financial analysis of the investment for its enhancement is developed. Finally, the conclusions are discussed in Sect. 5.

3 Framework

3.1 Statistics

Italy is currently, one of the countries with the highest longevity in the EU and the world [10]. Despite the tragic number of deaths due to the Covid-19 pandemic [1], the average age of the Italian population has been characterized by an increase, rising from 45.7 years at the beginning of 2020 to 46.4 at the start of 2023 [2].

A significant statistic pertains particularly to the condition of the elderly who are not self-sufficient, i.e. people aged at least 65 years who are unable to independently carry out daily life activities and without assistance. These individuals' number is approximately 2.9 million, and it has strongly increased in recent decades and is set to rise further in the coming years [3]. In 2050, 1/3 Italians are expected to be over 65 years old. Socio-economic developments (e.g. the decrease in multi-generational family units and an increase in female participation in the labor market) have contributed to reducing the availability of family caregivers to provide care and assistance to the elderly.

Therefore, RHFs have been subject to a rapid, demand-driven expansion in the last two decades [4]. In particular, RHFs are facilities that provide non-self-sufficient individuals, both elderly and otherwise, who have outcomes of physical, psychological, sensory, or mixed pathologies that cannot be treated at home, with a medium level of medical, nursing, and rehabilitative care. This is accompanied by a "high" level of custodial and hotel assistance, modulated based on the care model adopted by the autonomous regions and provinces [5]. RHF is an extra hospital facility of the National Health Service, that is part of the network of first-level territorial services [6].

In 2021, there were 325,032 elderly individuals over 65 who had at least one episode of stay in a RHF during the year, an amount that increased to 362,249 in 2022. In the same year, 2.58% of the elderly aged 65 or more had one or more admissions to a RHF [7]. Despite Italy showing an upward trend in the number of elderly people accommodated in RHFs, the current availability of 4,629 facilities distributed across the entire national territory [8] is not adequate to satisfy the emerging demand.

Currently in Italy, there are 18.6 beds available in RHFs for every 1,000 older residents. This is significantly below the OECD average of 43.8 [4]. At the territorial level, the availability is greater in the North-East with 9.9 beds per 1,000 residents, while in the South it is just over three beds per 1,000 residents and covers only 10% of the total beds [9].

3.2 Tariffs

In Italy, the RHFs represent an extremely fragmented reality with strong regional heterogeneity. There are vast differences from numerous perspectives, not only in terms of the services offered but especially in terms of regional regulation. The proportions allocated to regional health funds also vary, as do the tariffs [10, 11].

Indeed, the national regulations assign to the regions the responsibility of establishing the division of social and health costs for health and social care services aimed at non-self-sufficient or disabled subjects. Furthermore, the regions are tasked with determining the criteria for user participation in the costs of services [12]. This diversity, in a sense, is natural, considering the initial heterogeneity of the different Regions that have regulated socio-health residential services. These services may seem homogeneous, but within them, they present requirements, target ranges of recipients, and a mix of professionals that are significantly different [13].

The financing of RHFs is based on a principle of "co-payment" among the National Health Service, the user, and the social services of the Municipalities [14]. The distribution of the tariffs among these entities is influenced by both national regulations on Essential Levels of Assistance (LEA) and regional and municipal policies. National

directives, as established by the decree on LEA [15], suggest an equitable distribution of the tariffs, with a 50% division between the social and health sectors and the remaining share is burdened by the private user.

As for the costs borne by the user, in all Italian regions, these are associated with the hotel and care component of the service. The social share of the tariff of RHFs includes the so-called hotel expenses, which generally include food, cleaning of premises, laundry, meal assistance, and may also include other services. A precise and nationally shared definition of the social/hotel services of RHFs has never been made. The "hotel" quota borne by the assisted person varies greatly [12].

3.3 Market

According to recent research by BNP Paribas Asset Management [16], changes in global demographics have led European investors to healthcare opportunities that are "significantly attractive". As a result, new opportunities also arise and investing in sectors that can meet these demographic challenges provide long-term opportunities. [17]. Healthcare is always seen by developers and investors as a valuable alternative asset class, with clinics, nursing homes, and assisted homecare reported among the European and Italian top trends in real estate investments; therefore, a high level of quality is requested [18, 19]. From 2015 to Q3 2021, Italy's alternative investments hierarchy saw infrastructure (40%) leading, followed by nursing homes (23%), and hospitals/clinics (15%). This situation highlights their growing significance in Italy's investment landscape [20].

The RHF sector in Italy is relatively new, with significant investment volumes only starting to be registered in 2016. In the first three quarters of 2022, healthcare investment activity in Italy reached approximately 0.3€ billion, half of which was invested in the elderly care sector, whereas the remainder was allocated to hospitals [21]. It should also be noted that, as these are often new developments, it is much easier to integrate ESG principles [22–24] into these types of assets quickly and simply. Indeed, they allow for investments with a significant social impact, as they are primarily assets linked to social and demographic trends [25].

Even if decreasing, the level of yield observed in Italy is still attractive for European investors in comparison with other European mature markets. For secondary assets, yields could rise to 6.00%−8.50% depending on the property and location [26]. The market, characterized by the presence of a multitude of local managers, has been affected by the arrival on the national territory of professional operators (Korian, Kos Care, etc.), who through a consolidation process carried out through acquisitions, a process still ongoing, has led to a concentration of the market [27]. The consolidation of the market, the arrival of new international operators, and the numerous developing opportunities make this segment worthy of being analyzed, understood, and evaluated.

4 Case Study

The case study of present research concerns an office building currently in disuse [28, 29], located in the central area of the province of Udine (Northern Italy). The property, about 4,000 m^2, has been built in the late 1980s. It comprises two above-ground levels

and a subterranean floor. The vertical circulation within the building is facilitated by two staircases, both internal and external, in addition to elevators (Fig. 1).

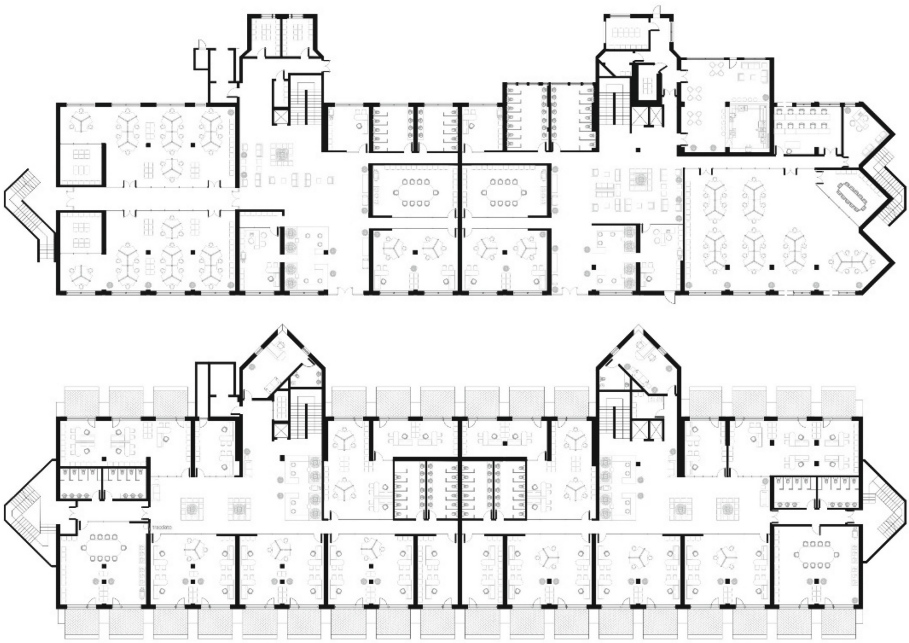

Fig. 1. Current status of the ground floor plan (above) and current status of the first floor plan (below).

In order to enhance the property by changing its use from office to a nursing home (i.e. an intended use that is greater appreciated in the specific market and is in accordance with the current urban planning regulations of the Municipality), the economic feasibility is assessed through the implementation of a Discounted Cash Flow Analysis (DCFA) technique [30, 31]. The year 2024 is the reference date of the valuation. The performance indicators of the evaluation have been obtained by assessing a series of critical factors, to be considered for the activation of a RHF, which can be traced back to the location of the intervention, market analysis and management, economic and financial aspects.

4.1 Market Analysis

Demand. The population referred to December 31, 2021, the latest available data, in Friuli Venezia Giulia region amounts to 1,194,647 residents and, compared to 2011, decreases by 2.1%. Between 2020 and 2021, the birth rate slightly decreased (from 6.2 to 6.1 per thousand), with a decrease of 165 births in absolute value. The population of Friuli Venezia Giulia region, in 2021, has been characterized by a significantly older structure compared to the total of the country. The average age, 48.1 years, is increasing compared to 2020 (47.9), and higher than the 46.2 years of the national average. The aging index also grows, going from 227.1 in 2020 to 231.8 in 2021 [32].

Supply. Residential structures, which include RHFs, are widely spread in Lombardy and Piedmont regions, which represent the first two ones in terms of numbers. However, they are less numerous in Friuli Venezia Giulia region, where there are 198 structures between RHFs and other residential structures, with a total of 9,806 beds. Focusing on the activities carried out by these residential structures in the field of elderly care, we can identify the specific activities of the RHFs. At the regional level, in Friuli Venezia Giulia region, there are 93 nursing homes for the elderly, all attributable to the RHFs [33].

4.2 Design

The general strategy of the intervention on the existing building supports the transition from old to new, emphasizing internal transformations. The primary aim is to create new distributive spaces while avoiding extensive interventions on the structural skeleton. Inside the new building, 122 beds are arranged in 7 single rooms and 115 double rooms (Fig. 2).

The condition of the elderly determines a conception of spaces dedicated to them that cannot disregard the respect of norms designed for people with disabilities. Consequently, in RHFs, architectural barriers are be abolished, and the available space is made fully usable by all guests of the residences [34]. The basic unit of the nursing homes is the module or core, composed of 20–25 places for the elderly who are not self-sufficient. The total reception capacity can vary from 20 to 120 places [6]. In their entirety, the solutions configure, on a residential scale, an articulated living fabric in which, next to the rooms, there are areas dedicated to social relations, connections between the various areas to facilitate the mobility of those present, and spaces reserved for occupational activities and laboratory work to actively engage guests, according to their experiences and attitudes [34]. The use of materials compliant with safety standards is mandatory [35].

4.3 Valuation

The evaluation of the enhancement investment on the case study property has been developed using the DCFA technique. This monetary evaluation does not consider the intangible social impacts of the project, therefore the perspective is strictly private, meaning that for the investor the optimal behaviour is to seek the maximum earning from the investment.

The analysis period has been determined as a balance between the specific factors of the property and the ability to predict market fluctuations. In this case, the DCFA has been carried out over an analysis period, by considering a lease temporal horizon equal to eighteen years (i.e. an ordinary 9 + 9 contract), as provided by the Italian Law No. 392/1978 for hospitality structures. The first two years of the analysis period have been allocated for the renovation of the entire property.

Due to the current inflation rate trend, both for revenues and costs, a decreasing rate has been adopted, equal to 2.4% in the second year, and 2% in the remaining years (the latter is the target value in the EURO zone in the medium-long term).

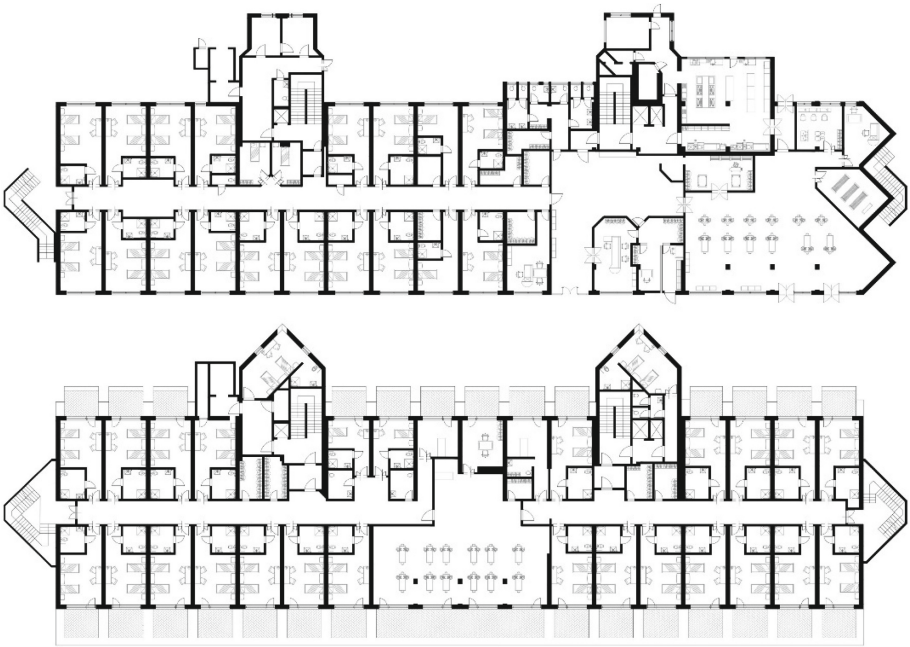

Fig. 2. Design of the ground floor plan (above) and design of the first floor plan (below).

Costs. The costs have been divided into three main categories: rental fees, operating costs and transformation costs. It should be outlined that in the first year, the expenses are related to transformation costs. The rental fees start in the second year, whereas the operating costs enter in the full operation condition in the third year (50% in the second year).

Rental Fees: Ordinarly, for RHFs the lease fees currently paid vary in a range between 5,000€ and 9,500€ per bed. In the specific case study, a lease fee of about 5,000€ per bed has been assumed. Taking into account that the nursing home activity will start at the second year of the analysis period, a reduction equal to the 50% of the lease fee has been considered for the first year. In Table 1 the temporal distribution of the rental fees is represented.

Operating costs: The literature agrees that [36], in order to interpret the dynamics and determinants of operating costs, it is necessary to classify them into two main categories: the hotel service and the socio-health service.

– The hotel service includes several cost categories (Table 2):

  - Laundry and ironing: Since the facility is equipped with an internal laundry, it is necessary to employ at least 4 workers, for a total annual cost of 107,016.21€ (i.e. 3% of the total operating costs).

Table 1. Account of expenses incurred for rental fees.

Periods	1	2	3	17	18
Total Rent [€/year]	300,625.75	601,251.50	613,276.53	809,205.35	825,389.46
% on revenues	–	24%	21%	12%	12%
Unit Rent [€/bed]	–	4,928.29	5,026.86	6,632.83	6,765.49

- Cleaning and sanitization of premises: This cost can vary significantly based on various factors, such as size, complexity of required services, and cleaning frequency. In this case, the presence of 9 staff members divided into different areas with daily frequency has been considered, resulting in an annual cost of 186,105€. Additionally, the cleaning of common areas, entrusted to an external company at a monthly cost of 3,000€ for 3 interventions per week, is accounted for. The total cost is 222,105€ per year (i.e. 7% of the total operating costs).
- Dining services: Meal management is entrusted to an external company, but as per regional regulations, the facility must be equipped with a kitchen, thus requiring at least 4 staff members, resulting in a total annual cost of 118,300€. In addition to this cost, the daily cost of meals is taken into account, which amounts to 11.83€. The total cost of the dining service amounts to 636,454.00€ annually (i.e. 20% of the total operating costs).
- Receptionist: To manage reception activities, 3 employees are expected to be hired, each working 8 h per day to cover the entire day. The total cost amounts to 91,260.00€ per year (i.e. 3% of the total operating costs).
- Gardening: For the maintenance of the green, internal management is assumed through the hiring of a gardener, the cost is 22,164.74€ per year (i.e. 1% of the total operating costs).

– For socio-healthcare costs (Table 3), the main component is represented by staff dedicated to this specific typology of assistance. Human resources constitute the most significant cost element in RHFs. In this case study, they are thus divided as follows:

- General Practitioner: Considering an average work week of 38 h for each individual doctor, it is necessary to have 4 doctors in the facility to cover the total hours. Therefore, the total annual cost amounts to 224,669.95€ (i.e. 7% of the total operating costs).
- Nurse: Considering a total of 36,254.40 work hours annually to be allocated for the total number of patients, it is hypothesized that 18 nurses are employed in the facility. Hence, the total annual cost amounts to 587,248.77€ (i.e. 18% of the total operating costs).

- Socio-Health Operator: The employment of approximately 40 socio-health operators in the facility is considered, for a total cost of 1,151,375.09€ (i.e. 36% of the total operating costs).
- Physiotherapists: Considering the number of users, it is deemed appropriate to employ 4 active physiotherapists in the facility. The total annual cost amounts to 180,492€ (i.e. 6% of the total operating costs).

Table 2. Account of expenses incurred for operating costs.

Periods	1	2	3	17	18
Laundry [€]	–	64,209.72	107,016.21	141,205.61	144,029.73
Cleaning [€]	–	133,263.00	222,105.00	293,062.83	298,924.09
Gardening [€]	–	22,164.74	22,608.03	29,830.82	30,427.44
Receptionist [€]	–	30,420.00	91,260.00	120,415.63	122,823.94
Dining service cost [€]	–	310,892.40	518,154.00	683,693.20	697,367.06
Kitchen employee [€]	–	70,980.00	118,300.00	156,094.34	159,216.22
Total dining [€]	–	381,872.40	636,454.00	839,787.54	856,583.29
Total hotel service [€]	–	631,929.86	1,079,443.24	1,424,302.43	1,452,788.48
% of total costs	–	11%	28%	28%	28%

Table 3. Account of expenses incurred for socio-healthcare costs.

Periods	1	2	3	17	18
General Practitioner [€]	–	134,801.97	224,669.95	296,447.23	302,376.17
Nurse [€]	–	352,349.26	587,248.77	774,862.28	790,359.53
Socio-Health Operator [€]	–	690,825.06	1,151,375.10	1,519,214.99	1,549,599.29
Physiotherapists [€]	–	108,295.20	180,492.00	238,155.36	242,918.47
Total socio-healthcare [€]	–	1,286,271.49	2,143,785.82	2,828,679.86	2,885,253.46
% of total costs	–	22%	56%	56%	56%

Transformation Costs: The expenditures necessary for transitioning from the office intended use to a nursing home are assessed (Table 4). The cost breakdown is determined as follows:

– Construction costs: Borrowing the data of the DEI price list [37], a parametric cost of 740.00€/m^2 has been estimated. This value has undergone adjustments. The total construction costs amount at 4,531,646.18€ and are referred to the first and the second years of the analysis period.

- Urbanization charges: These costs represent 10% of the sum of hard costs and security and coordination costs. The total amount is 475,823€ (i.e. 10% of the construction costs).
- Design and construction management: This item includes surveys, verifications, design, work management, etc., amounting to a total of 570,987€ (i.e. 12.6% of the construction costs).
- Social security charges: These amount to approximately 624,280€ (i.e. 13.8% of the construction costs).
- FF&E Acquisition: This is equal to 154€/m^2 for the furnishings for the patient rooms and health services, while a cost of 142€/m^2 for the collective services. The total cost amounts to 824,916.12€.
- Photovoltaic System: This is equal to 350,000€.

The transformation costs for the purposes of building renovation in the first two years amount to a total of 7,604,234.45€.

Table 4. Account of expenses incurred for transformation costs.

Periods	1	2
Hard and soft cost [€]	3,857,591.00	2,571,727.33
	60%	40%
FF&E Acquisition [€]	329,966.45	494,949.67
	40%	60%
Photovoltaic System [€]	210,000.00	140,000.00
	60%	40%
Total transformation costs [€]	4,397,557.45	3,206,677.01

Revenues. They are primarily constituted by the tariffs of long-term users (Table 5). Additional revenues are derived from ancillary structures and complementary services, which represent a marginal percentage, approximately 2.5% of the total revenue in the full operation of the nursing home.

The rates, divided by bed type, have been determined by examining the private share that is published for competitors, having comparable characteristics and located near the asset under examination. Figure 3 shows a competitive set composed of selected comparable structures has been identified.

The analysis of the tariff's private share published for the competitors has led to the determination of an average daily rate for beds in double rooms equal to 89.73€ per day. For beds in single rooms, the average daily rate is 93.57€.

Starting from the fifth year, in which the expected occupancy (equal to 90%) remains constant, it is planned to evaluate the regional tariff as revenue following the accreditation process[1].

With regard to the Friuli Venezia Giulia region, the D.G.R. of April 11, 2013, no. 650 approved the procedure for the authorization and accreditation of public and private RHFs. The requirements of the RHFs were subsequently integrated with the DGR of May 13, 2016, no. 817, currently in force. The D.G.R. no. 2088 of October 26, 2017 defined the regional accreditation program for public RHFs and specified the applicable requirements and procedure.

– The Friuli Venezia Giulia region determines the relative rates as follows:
– Basic care level: equal to 111€ per day of hospitalization;
– Average care level: equal to 134€ per day of hospitalization;

Rehabilitative care level: equal to 143€ per day of hospitalization.

Assuming a diversified user base with different levels of assistance, an average tariff equal to 129.33€ has been determined.

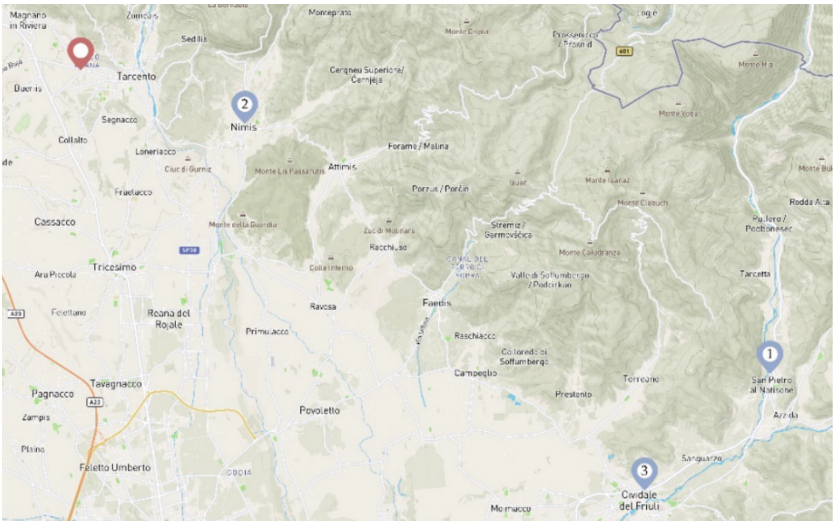

Fig. 3. Localization of the subject (in red) and the identified comparables (in blue).

The discount rate has been determined by borrowing the logic of the Weighted Average Cost of Capital (WACC): a financial structure composed of 50% of equity means and 50% of third-party means is hypothesized; taking into account Treasury bonds

[1] The accreditation processes in the healthcare sector were initiated starting from the '90s, so currently all Regions have defined the structural standards and regulated the organization of the RHFs. In the social assistance sector, the accreditation process for social-assistance structures has been introduced by law no. 328/2000 [41].

Table 5. Revenues.

Periods	1	2	3	17	18
Beds	0	122	122	122	122
Single room	–	7	7	7	7
Double room	–	115	115	115	115
Occupancy (%)	–	60%	70%	90%	90%
No. of beds	–	73	85	110	110
Rate-Tariff Euro/year	RATE			TARIFF	
Bed in a single room [€]	–	34,151.83	34,834.87	59,869.47	61,066.86
Bed in a double room [€]	–	32,752.67	33,407.72	59,869.47	61,066.86
Annual revenue					
Single room [€]	–	143,437.70	170,690.86	377,177.65	384,721.20
Double room [€]	–	2,259,934.00	2,689,321.46	6,196,489.90	6,320,419.70
Total bed revenues [€]	–	2,403,371.70	2,860,012.32	6,573,667.55	6,705,140.90
Other revenues [€]	–	60,084.29	71,500.31	164,341.69	167,628.52
% other revenues	–	2,50%	2,50%	2,50%	2,50%

rates and the specific investment risk (geographical context, suitability of the location to the intended use, real estate market trend; consistency, type/quality of building and maintenance, vacancy risk, solvency), the discount rate is assumed equal to 7.50%.

The Net Present Value (NPV) of the investment is positive, amounting to 1,068,344.07€, and the corresponding Internal Rate of Return (IRR) is equal to 9.00%. As the NPV is higher than zero and the IRR exceeds the established threshold (i.e. the

Table 6. DCFA.

Periods		1	2	3	17	18
Total revenues [€]		0,00	2,463,455.99	2,931,512.63	6,738,009.24	6,872,769.42
Total costs [€]		4,698,183.20	5,726,129.86	3,836,505.59	5,062,187.65	5,163,431.40
Cash flow [€]		−4,698,183.2	−3,262,673.8	−904,992.96	1,675,821.59	1,709,338.02
Discount rate	7,50%					
Discounted cash flow [€]		−4,370,402.9	−2,823,298.1	−728,483.6	490,099.08	465,024.24
NPV [€]		**1,068,344.07**				
IRR [%]		**9,0%**				

discount rate used for the implementation of the DCFA), the project is financially viable (Table 6).

5 Conclusions

Over the past few decades, the issue of care for the elderly who are not self-sufficient has gained increasing relevance, primarily due to the aging demographic trend of the Italian population. In 2022, in Italy the number of elderly significantly exceeds that of children, with a ratio of over five elderly for every child under six years old. This transformation is evident when compared to 1971, when for every 100 young people under the age of 15, there were only 46 people over the age of 65, whereas today this ratio has risen to 193 [38].

To address this anticipated demographic growth in the coming years, a substantial increase in the number of available beds in residential facilities for the elderly will be necessary. Currently, in Italy, only 1.7% of the elderly population can access such services, a coverage rates much lower than the 4–5% recommended by the European Union. To reach a coverage rate of 5%, it would be necessary to add about 600,000 beds by 2035, doubling the current offer of RHFs [39].

In response to this need, over the past ten years, the healthcare real estate sector in Europe has been characterized by a significant interest from institutional investors [40], transforming from a niche market to a strategic one. In particular, Italy represents one of the countries with the greatest opportunities for investment growth, due to the relevant gap between existing supply and demand, with only 4,000 RHFs and 200,000 beds in the country.

The attractiveness of investments in the sector is amplified by the fact that the return on RHFs is not strongly affected by their geographical location, but rather by the proportion of places agreed with the local health system. However, a regulatory harmonization among the different Italian regions is fundamental, as currently there are divergent rules regarding accreditations, agreements, and prices. This regulatory uniformity could prevent further geographical imbalances between the North and the South. Another positive factor is that this asset class guarantees long-term cash flows and is less influenced by economic fluctuations, as the socio-healthcare activity has a temporal constancy in the need for services from its users, independent of economic cycles, ensuring a low investment risk and providing a positive social impact.

The future of this class of real estate activities will certainly be characterized by strong investment growth, which will have to meet the growing demand linked to the aging of the population.

Note: The current study has been developed within the current research "Resilience and sustainability of urban regeneration initiatives. Methods for assessing the effectiveness of investments on the built environment", Call for Research Projects 2022, Sapienza University of Rome.

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