Economic Feasibility of Vacant Public Housing Reuse: A Financial Valuation Model for Socially Sustainable Regeneration in Historic Urban Contexts

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Abstract. Since the second half of the 20th century, Venice's historic center has faced a long-term population drop driven by industrial changes and, more recently, by the gentrification effects of overtourism. Beyond the impact of tourist rentals, the available building stock is largely obsolete and high-priced, making the historic center inaccessible to many potential residents. This study investigates the potential to reverse this trend by reusing vacant publicly owned housing, specifically that managed by the Local Public Housing Agency. By analyzing a sample of 49 properties, the paper proposes an economically sustainable model for recovery and management that facilitates low-priced rents. Renovation costs are estimated using a combination of direct site surveys and linear regression analysis, while the financial plan relies on a self-financing mechanism where rental income covers mortgage loan repayments. The project demonstrates strong financial feasibility, with indicators such as Net Present Value and the Annual Debt Service Cover Ratio ensuring viability. Furthermore, the model allows for a rent reduction of nearly 30% below market rates, bringing fees closer to social housing standards. Ultimately, the outcomes indicate that this self-sufficient system can be extended to the city's broader vacant building stock and replicated in different contexts, promoting favorable conditions for long-term repopulation.

Keywords: Public Housing Reuse · Social Housing · Economic Feasibility · Urban Repopulation

1 Introduction and Background Literature

The problem of population loss in the historic center of Venice began in the second half of the 20th century, due to changes in the city's economic landscape. Indeed, especially after WWII, important socio-cultural innovations began in the city [1]: the deindustrialization of the historic center and the industrial conversion of Porto Marghera transformed the historical work landscape. Due to these phenomena, the population had to move to the mainland, especially to Mestre and Marghera, just as it had done in many other historic centers of Italy. There, cars and newer, cheaper houses were able to better meet residents'

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needs. Throughout this period, between the 1950s and the 1970s, a significant drop in the population of the historic center is observed (up to -5.68% per year), while the mainland index rises (up to +6.4% per year) [2].

Alongside the socio-economic changes, building conditions also played a role. It should be pointed out that, according to 1985 data, 58% of the houses in downtown Venice were constructed before the Unification of Italy in 1861, and only 20% were constructed after 1945; between 43% and 48% needed drastic renovations; approximately 48% lacked an adequate heating system; 45% were exposed to significant humidity and approximately the same percentage received only three hours of sunlight a day in winter, due to the intricate labyrinth of small streets [3].

In the 1970s, the situation began to shift: the population was still leaving the historic center, but this time it was also due to the city's growing tourism. The uncontrolled expansion of this phenomenon was fueled by the workers and capital left in the historic center due to its deindustrialization, which could be used in other sectors, particularly tourism. Venice is currently experiencing the effects of gentrification due to overtourism. Throughout its history, the tourism industry has provided significant benefits, including the revaluation of real estate investments and new employment opportunities. However, it has also caused an excessive increase in the cost of living and real estate values, which has led more residents to leave [4]. The need for regulation is highlighted by municipal policies (such as the recently introduced entrance fee) and community voices. Visitors have a significant impact on the quality of life in the historic center, which is particularly problematic. The most significant problem, however, is the housing issue. The residential sector is negatively impacted by the lack of nearby services, as well as by the unavailability of prices and the shortage of homes in adequate condition. For this reason, we need to make improvements to the building stock to meet today's needs without making it economically unsustainable [5].

The purpose of this study is to assess the potential of reusing vacant publicly-owned dwellings to address the housing shortage and reverse depopulation in Venice's historic center. Finding suitable housing is a fundamental factor in choosing where to live and a significant challenge in the Venetian context. By increasing this supply, new residents and families could be attracted, also resulting in increased demand for the services they require.

To date, 17.3% of the city's buildings lack occupants [6], particularly in the historic center. Public entities hold 14.5% of this stock, with the Municipality and the Local Public Housing Agency (ATER) being the main owners. The latter oversees not only the properties constructed by the government specifically meant for low-income families as protected tenancies at social rents, but also additional properties available for regulated tenancies at fair rents, of which 169 are made available for this survey. Among them, a sample of 49 properties is chosen to investigate an economically sustainable model for recovery and management. A feasibility study is conducted by arranging to rent accommodation to teachers, technical staff and research fellows of one of Venice's universities. Better-maintained properties may be available immediately or in a short time. Therefore, the renovation of the remaining properties in the portfolio can be financed through a mortgage loan using the revenues from renting these properties. The project's economic strength is based on the auto-deduction of the rental sum from the university's salary,

which ensures stable and regular payment mechanisms. Over time, the financing of an increasing number of flats should be possible through the revenue from progressively renting the renovated properties.

The paper is organized as follows. Section 2 outlines the method used to calculate the costs of redeveloping the remaining units of the sample without conducting site inspections, and then presents data estimations for costs, revenues, interest rates, and the valuation model. The analyzed sample, the baseline data given by ATER for each of them, and the redevelopment costs derived for 21 of them based on actual site inspections are briefly described in Sect. 3. Ultimately, Sect. 4 presents the findings, while Sect. 5 draws conclusions and outlines further developments.

2 Methods and Data

2.1 Approaches, Methods and Models

To assess the economic feasibility of the entire project, the study is conducted as follows (Fig. 1). Rehabilitation costs are first estimated on a subsample of 20 dwellings based on a detailed survey of deterioration and work needed, before calculating the square meter cost of intervention. Then, statistical techniques are used to determine the costs for all other flats, utilizing information provided by ATER (e.g., last allocation date, last release date). Net revenues from housing leasing are then identified. Once a 10-year phased market entry schedule for all 49 units is established, the sources of project funding, interest rates, and debt service schedule are analyzed. The financial plan is reviewed and verified to ensure its overall feasibility, based on a cost-revenue analysis, viability for lenders, and project feasibility for promoters.

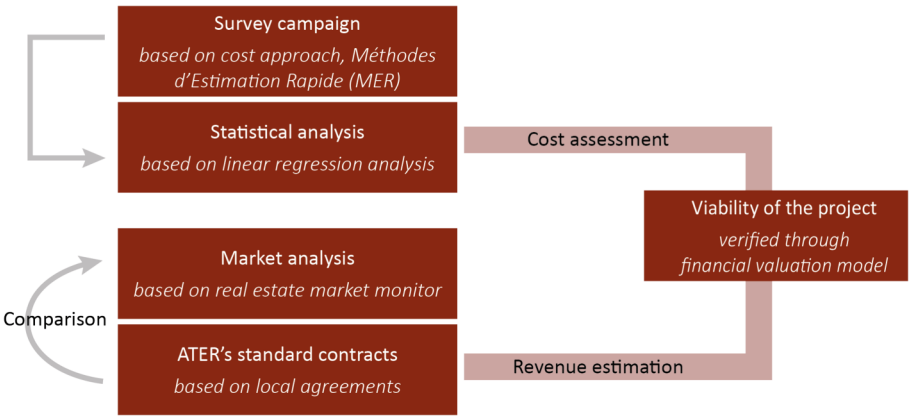

Fig. 1. Approaches used to assess the economic feasibility of the project

2.2 Cost Assessment

To estimate the redevelopment costs, the parametric and total costs for the redevelopment of the first core of 20 apartments are considered, calculated based on the survey conducted during the site inspections. The analysis of these data is done using economic statistical analysis software to compare them to the basic data available for all housing (last allocation date, last release date, floor level, gross and net floor area). Unit costs, total costs, and basic data are used as variables to fit linear regression curves (Fig. 2). The objective is to find a system that can recognize cause-and-effect relationships between them. These early models are examined, but no results of particular interest are found. Thus, a new criterion is assessed that turns out to be highly significant: a dichotomous variable associated with the illegal occupancy of the dwelling. Indeed, the maintenance status of a significant group of properties has been compromised because of that.

This first core of 20 dwellings is then divided into two subgroups based on the presence or absence of untitled occupations. The complementary criterion is the number of years since the last allocation, which is considered the most recent certain date of maintenance activities.

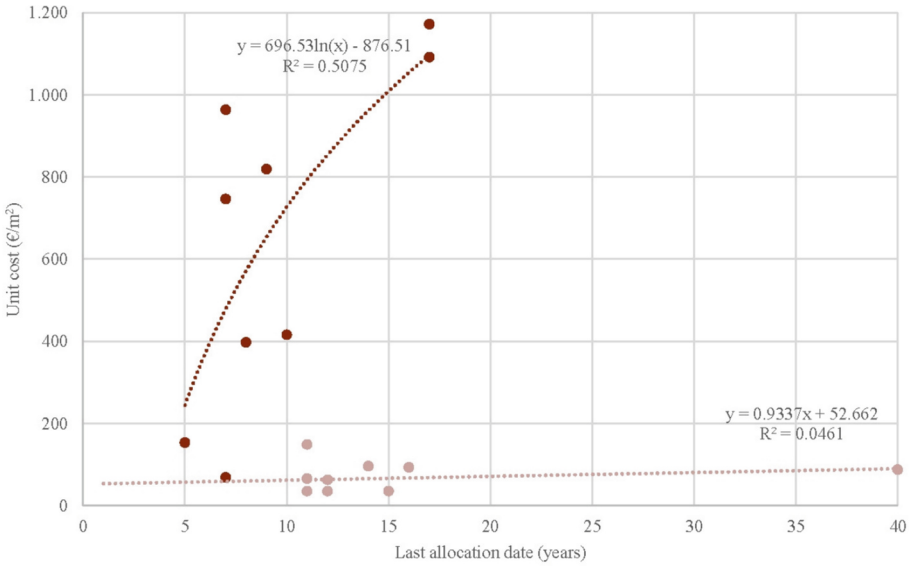

Fig. 2. Graphical linear regression analysis conducted to compare the unit costs of housing redevelopment to the last allocation date.

To determine the costs of renovation for the remaining 29 properties, two values are taken into account. For the first case of unoccupied properties, the median of their unit costs is considered, equal to €62.99. For the second case, the formula obtained from the statistical analysis is used:

$$Rc = 696.53 \ln (La)\text{-}876.51 \quad (1)$$

where *Rc* is the renovation's unit cost, while *La* stands for the number of years since the last allocation.

2.3 Revenue Estimation

Two sources are examined and compared to calculate housing rental fees and gross annual revenues once the first units are introduced to the market: the Real Estate Market Monitor (known in Italy as OMI) of the Italian Revenue Agency [7] and the so-called territorial agreements for the municipality of Venice, which ATER usually refers to sign social rent contracts [8].

OMI categorizes Venice's historic center into ten homogeneous areas based on uniform real estate values. OMI provides twice a year reports on the minimum and maximum market values and rental fees for various building typologies, intended uses, and conditions. The properties under examination will be rented in good condition, almost like new flats, but the same does not hold for the buildings they are in. Therefore, the average value of the rental fees is used in the analysis.

The territorial agreements for Venice's municipality are examined in relation to subsidized tenancies. Several oscillation bands are featured for different homogeneous areas. The fair rents vary within house ranges depending on the maintenance status of the flats and their equipment. Ultimately, the fair rent estimated according to the territorial agreements is approximately 20% lower than the OMI average rent.

The annual net revenues from leases are calculated by subtracting the following deductions, based on appraisal manuals and recent publications, from the gross sums [9–11]: administration costs (3.0%), vacancies and insolvencies (3.0%), maintenance (3.0%) and amortization (1.0%) costs, insurance costs (0.5%), and taxation, considering the tax concessions for these agreements (5.67%); resulting in a total deduction of 16.17%.

2.4 Timeline and Interest Rate

A timeline is established, featuring five groups of building units, distributed over time based on the scale and cost of maintenance (Fig. 3).

The time needed to complete work on the first group of apartments is estimated at roughly six months. The remaining groups are implemented gradually over a 10-year period, which is expected to be sufficient to complete the redevelopment of all 49 dwellings and repay the total debt.

It is assumed that ATER contributes 10.5% of the total funding. This amount can be used to cover the intervention costs for the first two groups of housing and as a guarantee for getting a loan from a lending institution. The latter will cover the remaining 89.5% of the expenses for redeveloping the three remaining groups.

The base interest rate is estimated as the average rate of 10-year fixed-rate mortgage loans, equal to 2.14% [12]. The spread is estimated based on the additional rate applied by the Italian Deposits and Loans Fund to public housing agencies, 1.25% for a 10-year maturity [13], leading to a total rate of 3.39%.

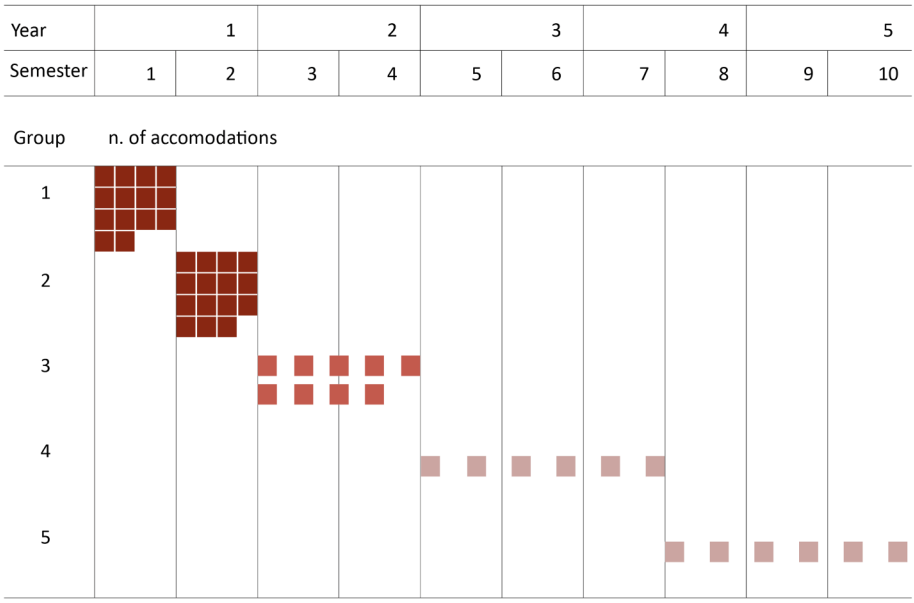

Fig. 3. Graphical diagram representative of the distribution over time of the works related to the groups.

2.5 Evaluation Model

A financial plan (FP) is developed for the analytical assessment of the economic viability of the project (Fig. 4). The initial analysis focused on the overall feasibility expressed by the Net Present Value (NPV). Then, the bankability for the lenders is considered, namely the ability of the project to repay the debt incurred and pay the interest accrued in each period. Lastly, the project's feasibility for the partners is analyzed, meaning the provision of social housing for its community from the University's perspective and asset value preservation from ATER's point of view.

Concerning the debt service, a ten-year amortization plan is created. Installments, paid in arrears and always of the same amount, are calculated according to the formula below:

$$I = D \cdot r / \left[1 - 1/(1+r)^n\right] \tag{2}$$

where: I is equal to the installment, D is the debt principal to be repaid, r is the interest on a half-yearly basis, and n is the number of installments.

Bankability is verified using the Annual Debt Service Cover Ratio (ADSCR), which measures the ratio between the year-by-year cash balance and the corresponding debt service. ADSCR should reach a minimum value of 1.35, as per the guidelines set by the national foundation of accountants association [14].

ATER's interest to ensure that its assets do not lose value over time is verified by setting a target yield (5.39%), which is slightly higher than the inflation rate estimated (2.1%) and includes an additional premium rate for capital immobilization over a ten-year time window (2%) [15, 16].

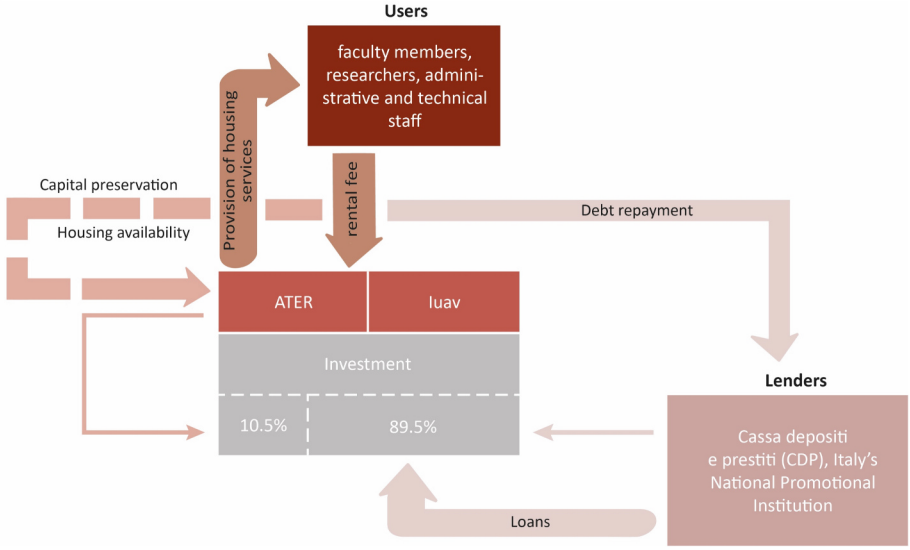

Fig. 4. Graphic representation of the financial plan that depicts the stakeholders involved.

3 Overview of the Property Sample

Following a first agreement signed in 2023 between ATER and the University Iuav of Venice, the public housing agency has provided a list of 169 accommodations spread throughout the historic center, except in the most central districts of San Polo and San Marco (Fig. 5). The 169 dwellings share the following characteristics: they are currently empty, they require renovation works that ATER can hardly afford to finance, and they are not intended for protected tenancies at social rents. Several of these building units are located in the same areas where major public housing construction initiatives took place in the 20th century [17]. Indeed, the buildings were constructed between 1901 and 1934 and have undergone various maintenance and building adaptations over time. However, there is no precise information on the date and type of the most recent maintenance work.

The accommodations differ in their maintenance status, classified as poor, mediocre, and excellent; surface area, ranging from 32 to 118 m2, with an average of 54 m2; and floor level, from ground to fourth, with an average between the first and second floors.

A sample of 49 units is chosen to assess the recovery intervention and its management. The extraction is conducted by increasingly ordering the homes according to three parameters: *La* (i.e., last allocation date) = number of years since the last housing allocation date, prioritizing the most recent ones as the last ones of intervention; *Lr* (i.e., last release date) = length of time since the last release date, which suggests the time since maintenance activities have ceased; *Oc* (i.e., period of occupation) = period of occupation (in months), which has proportionally affected the state of the place. Ordering houses in this manner will increase the likelihood of receiving housing in good condition, allowing the project to begin with lower costs and shorter renovation times. A

sample with better conditions than the overall average emerges, but it is still sufficient to represent the technical characteristics of the whole.

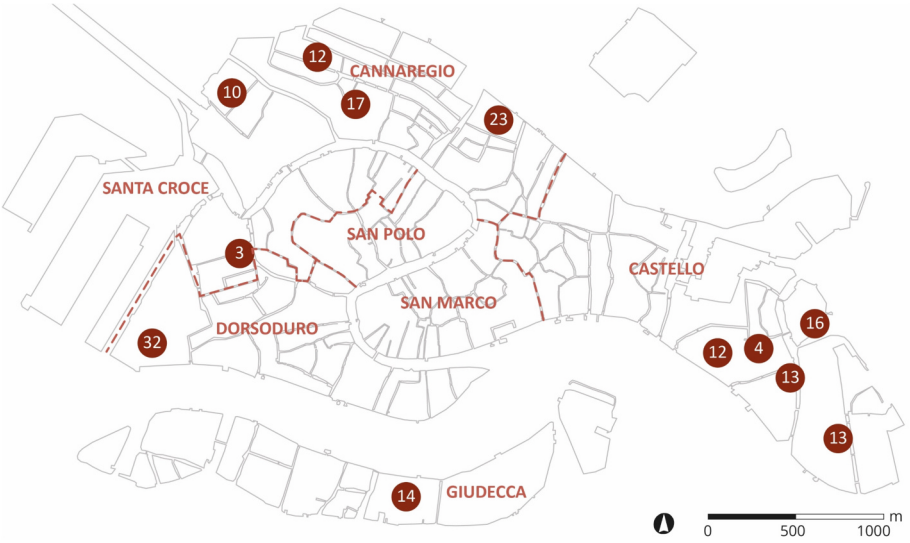

Fig. 5. Number of dwellings in Venice's historic center based on their location.

A survey campaign is carried out in 20 flats using a point survey sheet based on similar studies conducted in the 1970s and 1980s (Table 1, Table 2, Fig. 6). Depending on the extent of deterioration, the survey sheet assigns a score (from 1 to 4) to each building element and installation. The score is associated with the marginal restoration cost, expressed in €/m^2 for gross floor areas. By calculating the points assigned to each accommodation, we are able to determine the renovation cost per m^2, which in turn leads to the total maintenance costs. Related insights into cost estimation can be found in a recent dedicated publication [18].

Table 1. Excerpt of the survey sheet for the assessment of the deterioration: scores assigned during the survey (source: [18]).

Element	Score			
	Very good condition	Somewhat good condition	Somewhat poor condition	Very poor condition
	4	3	2	1
1. Internal wall cladding		X		
2. Independent heating system	X			

Table 2. Excerpt of the survey sheet for the assessment of the deterioration: the relationships between levels of deterioration and scores (source: [18]).

Element	Score	Description
Internal wall cladding	4	Excellent condition – no works needed
	3	Complete painting
	2	Partial renovation of plaster (up to 10%) and complete painting
	1	Complete renovation of plaster and painting
Independent heating system	4	Norm-compliant and excellent condition – no works needed works needed
	3	Boiler replacement
	2	Replacement of boiler and radiators
	1	Complete replacement of the heating system



Fig. 6. Images captured during the survey campaign. From left to right, the accommodations are classified as excellent, mediocre, and poor (source: authors' survey).

4 Results and Discussion

The model tested on the remaining 29 dwellings in the sample yields the following results. Table 3 displays the renovation costs obtained through statistical analysis and the rental fees. The renovation cost of the 49 apartments is expected to be close to one million euros, while their annual rent revenues will be approximately 0.3 million euros.

The cost estimation method used here lends itself to some additional remarks. The developed cost analysis model does not exhibit strong statistical significance, primarily due to the limited sample size of 20 apartments and the low R2 index associated with the curve fitted to the available data. Nevertheless, the results obtained are considered meaningful and provide relevant insights for the purposes of this study. The cost to restore a property that has never been unlawfully occupied since its last release is expected to be relatively low, ranging from 30 €/m^2 to 150 €/m^2, regardless of the last date of housing allocation. Indeed, this accommodation is considered to have remained closed and unused without undergoing any kind of significant degradation. Instead, the cost to refurbish a property that has been unlawfully occupied will be substantially higher, reaching up to 1,200 €/m^2, with an increase depending on the last allocation date.

According to the FP, the project has a high level of sustainability. From the beginning, the income generated by the rent payments is well beyond the repayment installment. This led to two thoughts. First, it is possible to maintain sustainability even in the event of delays. Even if the investment schedule drags out over time and subsequent housing groups delay in generating revenue, debt service can still be paid off due to the high degree of project feasibility. If this does not happen, then the project can be extended to the remaining 120 properties in the initial sample within a short period of time. Second, it is possible to decrease the rent. The project's economic viability is also confirmed by adopting a rent benchmark below average market rents, namely, agreed or fair rents.

The second observation is particularly important toward the goal of repopulating the historic center of the city, which is the main objective of this project. By accepting a small decrease in the bankability, which does not negatively impact the project's overall feasibility, rental fees can be decreased up to 28,5%. This change is significant because it reduces the average rental rate to nearly 8,50 €/m^2 monthly, which is closer to the social housing policies in Italy. The FP that comes from this choice can be seen in Table 4.

Table 3. Renovation costs obtained through statistical analysis and the annual revenues discovered. Data refers to 2024.

Ref	Unlawful occupation	UA	Unit cost (Eq. 1)	Gross floor area	Total cost	Area	Annual revenues
	(yes/no)	(years)	(€/m^2)	(m^2)	(€)		(€/y)
1	1	5	153.32	61	9,320	Castello east	5,436
2	0	6	62.99	46	2,918	Castello east	4,143
3	1	7	963.92	72	69,836	Dorsoduro	6,479
4	1	7	68.444	47	3,227	Cannaregio south	5,013
5	1	7	478.87	67	31,940	Castello east	5,964
6	1	8	397.33	83	32,899	Cannaregio north	7,404
7	1	7	746.29	84	62,650	Cannaregio north	7,507
8	1	7	478.87	56	26,692	Castello east	4,984
9	1	8	571.88	57	32,554	Cannaregio south	6,052
10	1	9	819.10	71	58,401	Cannaregio north	6,376
11	1	10	727.31	68	49,347	Castello east	6,067
12	1	10	415.68	79	32,983	Cannaregio north	7,096
13	0	11	35.46	68	2,405	Dorsoduro	6,067
14	0	11	35.46	63	2,242	Cannaregio north	5,656
15	0	11	35.46	61	2,161	Dorsoduro	5,450
16	0	11	62.99	43	2,680	Castello east	3,805
17	0	11	149.11	84	12,517	Castello east	7,507
18	0	11	66.02	63	4,175	Dorsoduro	5,656
19	0	11	62.99	53	3,324	Giudecca	4,719
20	0	11	62.99	68	4,273	Castello east	6,067
21	0	11	62.99	49	3,097	Giudecca	4,397
22	0	12	35.46	47	1,671	Cannaregio south	5,013
23	0	12	62.99	48	3,042	Cannaregio north	4,319

(*continued*)

Table 3. (*continued*)

Ref	Unlawful occupation	UA	Unit cost (Eq. 1)	Gross floor area	Total cost	Area	Annual revenues
	(yes/no)	(years)	(€/m^2)	(m^2)	(€)		(€/y)
24	0	12	62.99	60	3,766	Giudecca	5,347
25	0	14	95.98	72	6,953	Castello east	6,479
26	0	14	62.99	72	4,563	Castello east	6,479
27	1	14	961.67	37	35,389	Castello east	3,291
28	0	15	62.99	84	5,287	Castello east	7,507
29	0	16	62.99	46	2,897	Cannaregio south	4,891
30	0	16	62.99	47	2,951	Giudecca	4,191
31	0	15	62.99	74	4,636	Cannaregio north	6,581
32	0	15	62.99	52	3,259	Castello east	4,628
33	0	16	62.99	90	5,650	Cannaregio north	8,021
34	0	15	62.99	70	4,418	Cannaregio north	6,273
35	0	15	62.99	70	4,418	Cannaregio north	6,273
36	0	16	62.99	68	4,273	Cannaregio north	6,067
37	0	15	35.46	68	2,405	Castello east	6,067
38	0	16	62.99	53	3,332	Cannaregio south	5,624
39	0	16	93.26	71	6,649	Cannaregio north	6,376
40	1	17	1096.91	39	42,889	Castello east	3,496
41	1	17	1096.91	70	76,948	Castello east	6,273
42	1	17	1172.13	46	53,918	Dorsoduro	4,113
43	0	17	62.99	43	2,680	Castello east	3,805
44	0	16	62.99	72	4,563	Castello east	6,479
45	0	16	62.99	66	4,128	Cannaregio south	6,969
46	1	18	1136.72	54	61,439	Cannaregio north	4,833
47	1	17	1091.86	51	55,248	Castello east	4,525

(*continued*)

Table 3. (*continued*)

Ref	Unlawful occupation	UA	Unit cost (Eq. 1)	Gross floor area	Total cost	Area	Annual revenues
	(yes/no)	(years)	(€/m^2)	(m^2)	(€)		(€/y)
48	1	18	1136.72	63	71,897	Dorsoduro	5,656
49	0	40	87.77	47	4,138	Cannaregio south	5,013

Table 4. Financial plan developed for the analytical assessment of the economic viability of the project.

	Items	Units of measures	Values
	CAPITAL EXPENDITURE		
	Total redevelopment costs	€	979,260
	Total revenues	€	281,165
	TIMEFRAME		
ETC	Estimated Time of Completion	years	15
E	Equity	pct.	10.5%
D	Debt	pct.	89.5%
CoC	Cost of Capital		
ke	Cost of equity	pct.	5,39%
kd	Cost of debt	pct.	3,39%
wacc	Weighted cost of capital	pct.	3,60%
I	Instalment	€/semester	52,049
NPV	Net Present Value	€	1,570,231

5 Conclusion and Further Developments

The project is well-balanced, providing both economic and social benefits for all the involved stakeholders. By distributing the costs required for the redevelopment of the sample of 49 dwellings over time, the costs themselves can be covered by the revenue from housing entering the rental market. A system with economic self-sufficiency can be created. Therefore, the study presented demonstrates the project's economic sustainability and confirms its financial feasibility. Furthermore, it introduces the possibility of setting rent rates that are accessible to the majority of households, which addresses one of the primary causes of Venice's depopulation. This outcome aligns with the project's initial social objectives, which focus on promoting policy regeneration for the repopulation of the historic center.

The plan is capable of handling any adverse scenarios, such as lower-than-expected revenues, higher costs, and redevelopment times, as confirmed by the key indicators (ADSCR and NPV). This study suggests that the proposed plan can be applied positively to the entire property sample. It is feasible despite the advanced state of disrepair in some of them, which can lead to significant expenses when compared to the revenue generated.

Future developments are mainly focused on two strands. The research does not take into account measures aimed at improving the energy efficiency of the building units. Although higher costs may be introduced in the initial phase of work, they can still bring financial benefits to the property owner and tenants. Secondly, the accessibility issue is worthy of further investigation, as the dwellings require additional work to be made functional and suitable for various users, and especially for disabled people.

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Disclosure of Interest. The authors have no competing interests to declare.

References

1. Zannini, A.: Il Turismo a Venezia Dal Secondo Dopoguerra Ad Oggi. Lab. Ital., 191–199 (2014). https://doi.org/10.4000/laboratoireitalien.848
2. Istat Popolazione Venezia 1871–2023 Available online: istat.it. Accessed on 1 Apr 2024
3. Pacione, M.: Venice, Cities 2, 290–296(1985) . https://doi.org/10.1016/0264-2751(85)90083-6.
4. Fregolent, L.: Cambiamenti Demografici e Socio-Economici Nella Venezia Contemporanea. In: La rivista di Engramma, vol. 155, pp. 163–174. Edizioniengramma (2018)
5. Basso, M., Di Croce, N.: Venezia: Casa, Spopolamento e Dinamiche Turistiche. In: Venezia città sostenibile, pp. 41–49. Anteferma Edizioni, Conegliano (2020)
6. Istat Censimento Della Popolazione e Delle Abitazioni Available online: istat.it. Accessed on 1 Sept. 2024
7. OMI Quotazioni Immobiliari Available online: agenziaentrate.gov.it. Accessed on 1 Nov 2024
8. Organizzazioni sindacali; Associazioni degli Inquilini e dei Proprietari Patti Territoriali 2018 Available online: comune.venezia.it. Accessed on 1 Nov 2024
9. Forte, C.; De' Rossi, B.: Principi Di Economia Ed Estimo, Milano, Etas (1979)
10. Orefice, M.: Estimo: UTET libreria: Torino, Vol. II, Estimo civile (1995)
11. Manuale Operativo Delle Stime Immobiliari. Agenzia del Territorio, Ed. Franco Angeli (2011)
12. Osservatorio Il Sole 24 Ore EURIRS. Available online: mutuionline.24oreborsaonline.ilsole24ore.com. Accessed on 5 Dec 2024
13. Cassa depositi e prestiti Condizioni Economiche Sintetiche Vigenti. Available online: cdp.it. Accessed on 5 Dec 2024
14. De Luca, R.; Lucido, N. Linee Guida per La Redazione Del Piano Economico-Finanziario Nelle Procedure Di Partenariato Pubblico-Privato: Aggiornamenti in Base al Nuovo Codice e Alla Prassi Recente Available online: fondazionenazionalecommercialisti.it. Accessed on 1 Dec 2024
15. Dipartimento del Tesoro Rendimenti All'emissione - 3° Trimestre (2024). Available online: dt.mef.gov.it. Accessed on 1 Dec 2024
16. Hoesli, M.; Morri, G. L'investimento Immobiliare. Mercato, Valutazioni, Rischio e Portafoglio, Milano, Hoepli (2010)

17. Ferrighi, A.lessandra:. Venezia e La Casa Salubre : Dai Piani per La Città Alle Abitazioni a Premio (1891–1925); Steinhaüser Verlag, Wuppertal (2020). ISBN 9783924774820
18. Bonifaci, P.; Donati, E.; Zelbi, I.; Copiello, S. Social Re-Housing in Venice. A Case Study on the Empty Dwellings of the Local Public Housing Agency. In: Oppio, A., Bottero, M., Stanghellini, S., Rossitti, M., (eds). Local Economic Systems and Housing Real Estate Markets in University Towns, pp. 17–32. Springer, Cham (2025)