Concession and lease or sale? A model for the enhancement of public properties in disuse or underutilized

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Abstract: - Although in many European countries the enhancement of public properties constitutes a theme of primary importance in the current economic situation, almost never Public Administrations have appropriate skills to rationally evaluate the best modality of valorization. This paper develops and test an evaluation model to support decisions of Public Administrations involved in the identification of the best modality of enhancement (*concession and lease* or *sale*) of public properties in disuse and/or underutilized. The model can be applied to any type of public property, but this research is focused on religious cultural buildings in disuse, common in Italy both in big cities and in smaller towns. The assumption underlying the model is that, since the properties considered are complex buildings, generally characterized by large dimensions, the form of bilateral monopoly market is always verified. The application of the model to three concrete cases, concerning religious buildings in disuse located in different areas of Southern Italy, shows that the model is a tool of simple use, exportable in any territorial context. The paper must be attributed in equal parts to the authors.

Key-Words: - valorization, religious buildings, public properties, sale, concession and lease, bilateral monopoly, market value.

1 Introduction

The lack of public funding and spending limits imposed by the Stability Pact have been directing the policies of the major European countries towards more careful management of available resources.

In this context, the valorization of public properties in disuse or underutilized - also those characterized by cultural values - is assuming a strategic role. The European Framework Program for Research and Innovation (Horizon 2020) points out the positive effects that may result from the valorization of the public buildings of cultural heritage, as a synthesis of the traditional passive protection of these assets - that is proved unfit as well as financially unsustainable for the Public Administration - and their "productive" use, through modalities compatible with their nature and vocation [1].

Italian legislation provides that the valorization of a public property can take place in two modalities: the alienation of the property or the "direct" valorization [2].

The alienation of the property involves the sale of it, i.e. the transfer of the property to another (public or private) entity. Considered at first as the panacea for reducing the national debt and satisfying the constraints of the European Stability Pact, the alienation of public properties, after the initial enthusiasm, is currently characterized by a deadlock. The flop of numerous auctions, almost desert, has highlighted the difficulties related to the sale of complex properties [3] and characterized by considerable dimensions. The worsening of the economic recession, the credit crunch, the current crisis in the housing market and the fear of a "fire sale" of public assets, as well as the difficulty to assess properties located in a limited market [4] or without comparables [5], have been leading many Governments to assume a waiting attitude and to discuss alternative solutions to the transfer of ownership of public properties [6]. Rather than a passive approach to public assets, the Public Administration in recent years has adopted a strategic attitude of considering these properties as resources to be exploited to achieve certain goals [7, 8].

The "direct" valorization includes instead all modalities of re-use according to which the Public Entity retains the ownership of the public property: for example, the recovery of a public property directly managed by the Public Administration, or

the concession of use to a private operator, in order to produce goods and/or services of collective interest.

The use of models of Public-Private Partnerships (PPPs) can allow to optimize the phases of realization and management of the projects. Although the case studies of the types of partnerships undoubtedly include the financial aspects, PPPs should be considered an opportunity for the public sector to buy a set of services subject to specific terms and conditions [9]. The solution of PPPs responds to the need to find new forms of financing and introduce specialized skills in the operations of efficient development and management of these properties [10, 11].

In most cases, public properties to be enhanced are cultural buildings in disuse, whose potentialities collide with their preservation constraints.

The need of a compromise solution between the public usability and the instances of preservation of cultural heritage has generated a number of policy measures taken at national and international levels.

Furthermore, the increase in the cultural and income levels, the greater availability of leisure time and the improvement of transport and communication services have facilitated a raising in the consumption of cultural heritage [12]. Some authors have analyzed how psychological factors such as entertainment, education, escape from the monotony, the opportunity to spend time with own family, nostalgia, constitute an important motivation for tourists to take advantage of the cultural heritage [13]. In addition to increasing the level of education of an individual and to be a significant component of the recreational activities, cultural tourism is a source of wealth and jobs [14]. The activities related to cultural heritage not only create significant economic flows, but can also be used as a vehicle for the transformation of certain geographic areas, therefore they are part of many strategies for local and regional economic development [15, 16]. Other authors identify the cultural heritage as a lever for creating jobs, and highlight that the results can be used to justify investment in the promotion of cultural heritage [17, 18].

The economic effects generated by the enhancement of public properties in disuse, symbol of a permanent urban backwardness, and of properties currently used for public functions but characterized by an unexpressed income capacity, constitute an essential reference for the allocation of national resources and Community funds, managed by Public Administrations responsible for identifying catalytic investment for local development.

2 Aims of the work

The inventory of public properties is extremely diversified for typology: military barracks, lighthouses, castles, monasteries, churches, chapels, historic buildings, prisons, etc. In most cases these properties have an intended use that does not coincide with their *highest and best use*, i.e. the use capable of maximizing the intrinsic profitability of the property. The change in the intended use involves effects on the urban structure that can constitute a stimulus to the processes of economic and social development of the territory. The decision-making process concerning property requalification must carefully assess any future scenarios as well as consider the costs, benefits and risks of every possible option [19, 20, 21].

Although the enhancement of public properties constitutes a theme of primary importance in the current economic situation, almost never Public Administrations have appropriate skills to rationally evaluate the best modality of valorization.

In this paper, a model that the Public Administration can use to identify the best modality of valorization (*concession and lease* or *sale*) of a property in disuse has been developed.

The model can be easily applied to any type of public property to be enhanced, but in this paper the religious buildings in disuse has been specifically taken into account, that are very frequent in Italy, especially in cities of ancient origin. The basic hypothesis of the model is that, for large dimensions that generally characterize the properties in analysis, both in the case of sale as in the concession and lease, there is the form of *bilateral monopoly* market. In this situation the exchange price is not defined a priori, but only a range of values of the equilibrium price can be determined, depending on different characteristics, expression of the contractual capacities of the parties involved.

The algorithm proposed operates through two phases: in the first, the equilibrium price for the two possible (public and private) contracting parties is determined in the hypothesis of sale and in the hypothesis of concession and lease; in the second phase, the best solution between sale and concession and lease is identified, according to the financial needs of the Public Administration and of the private entrepreneur.

The paper is structured as follows. In section 3, normative references and tools for the enhancement of public properties in disuse or underutilized, that have been developed in Italy in recent years, are mentioned. In section 4, the focus is on the religious buildings in disuse, whose the main characteristics are illustrated. In section 5, the hypothesis of the

work are introduced and the model for the identification of the best modality of enhancement of public properties, both in case of sale of the property as in case of concession and lease of the property, is defined. In section 6, the model is applied to three concrete cases, concerning religious buildings in disuse located in different areas of Southern Italy. The results are illustrated. In section 7 the conclusions of the work are discussed.

3 Normative references and enhancement tools

In the area of enhancement of public properties, in recent years there has been a wide normative production throughout Europe.

In Italy, last regulatory actions related to public properties have aimed, on the one hand, to activate a common valorization process of a plurality of public properties, in order to create, in the economic and social context in which the properties are located, elements of stimulation and attraction of additional local development initiatives; on the other hand, to simplify the process that leads to the formalization of the new intended uses.

Among the most recent regulations, aimed at rationalizing the divestment of public properties, the Decree Laws Nos. 112/2008, 85/2010 and 133/2013 must be mentioned.

With the Article 58 of the Decree Law No. 112/2008, the legislature has provided that Regions, Provinces, Municipalities and other local authorities can identify, in the own territory of jurisdiction, public properties no longer instrumental for the performance of official duties, that can be valorized or sold. For these assets, the competent authorities must develop an alienation and valorization plan to be attached, in each year, to the forward estimate.

The Decree Law No. 85/2010 has introduced the concept of "State property federalism", phenomenon accessory to the fiscal federalism: it consists in the transfer of properties owned by the State to local authorities. The Decree Law No. 85/2010 provides for the identification of State properties that can be transferred to Municipalities, Provinces, Metropolitan Cities and Regions, in order to promote the "maximum functional valorization" of these assets. For the transferred properties, processes of alienation can be established by local authorities.

To facilitate the divestment of public properties, through the Decree Law No. 133/2013 the simplified mechanism of direct sales, already provided for assets owned by the State, has been

extended to properties owned by local authorities.

Therefore, the State Property Agency is authorized to sell by private treaty a series of properties belonging to the heritage of the State. The sale generates the abolition of the government, existing concessions and any rights of first refusal which could belong to third parties in the event of resale.

Alongside these rules, the legislature has defined several instruments for the enhancement of public assets, among which the concession of use, Unitary Valorization Programs, Unitary Programs for the Valorization of the Territory, the tools for the management and the valorization of real estate assets and the "Valore Paese Dimore" Project.

Since 2001, by the Article 3-bis of the Decree Law No. 351/2001 (as amended and supplemented), the valorization and the utilization for economic purposes of properties owned by the State has been planned through the concession of use. In summary, the concession is an instrument of PPPs that allows to develop and enhance public properties through the assignment, to market operators, of the right to use them for economic purposes in a certain period of time; the concessionaires, in return, assume responsibility for their rehabilitation, functional conversion and ordinary and extraordinary maintenance. The duration of the concession is commensurate with the payback period of the initiative for the concessionaire, and for a period of time, however, not exceeding 50 years. When the concession expires, the State has again the full availability of the properties, with the acquisition of each transformation, enhancement, addition and accession made to them. Recently, the Law No. 228/2012 has introduced the possibility that, at the end of the concession, the Ministry of Economy and Finance, after verifying the achievement of the purposes of redevelopment and conversion of the properties, can recognize to the concessionaire the right of first refusal to purchase the property at the market price, when there are not requirements for institutional purposes.

The Unitary Valorization Programs (PUV) - pursuant to subsection 262 of Law No. 296/2006 - are aimed at two main objectives: 1) to rationalize and enhance public properties of a territory through operations of exchange, transfer and concession of use; 2) to make available properties owned by the State mainly through the concession of use, for the development of economic activities coherent with European, national and regional strategies of economic planning.

Introduced by Article 27 of Decree Law No. 201/2011, the Unitary Programs for the Valorization

of the Territory (PUVAT) are designed to activate and conclude in certain times, set by the Administrations involved, a "unique" process of valorization of public properties, in line with the recommendations of territorial development and with the economic planning. The aim is to establish, within the economic and social context of reference, an element of stimulation and attraction of initiatives of local sustainable development, as well as to increase local public amenities and social housing.

With Articles 33 and 33 bis of Decree Law No. 98/2011 new financial vehicles to increase the economic and social value of public properties have been introduced. Article 33 provides for the creation of an integrated system of real estate funds [22], with the aim of increasing the efficiency of the processes of development and enhancement of properties owned by the State and by local communities. Specifically, by Decree of the Minister of Economy and Finance, the constitution of an Asset Management Company has been provided for the establishment and the management of one or more real estate investment funds, that pursue strategic objectives, including the reduction of public debt. In Article 33-bis the activities of valorization and management of public properties are defined that, by using PPPs and the institutional consultation, establish operational models that provide for the direct or indirect involvement of private operators.

The "Valore Paese Dimore" Project, developed by the State Property Agency, is aimed at strengthening the Italian cultural supply and competitiveness, through the leverage of the sustainable tourism. Inspired by the model of the Spanish "Paradores" and Portuguese "Pousadas", the "Valore Paese Dimore" Project aims to create a national network of receptive-cultural buildings, to be realized in public properties in disuse characterized by great historical and artistic values and in environmental and landscaped sites, in order to promote the Italian excellence and enhance the cultural and touristic supply and the development of the territory. The objective is to create a new system of hotel accommodations for demand flows that are more sensitive to the enjoyment of cultural heritage.

4 The religious buildings in disuse

These are properties originally dedicated to religious functions (oratories, churches, chapels, monasteries, sanctuaries, etc.), but that are currently in a state of abandonment. Among the various causes, there are the decrease in religious vocations and the high

costs of management of the buildings - often really huge - intended exclusively for a religious function, so for financially unprofitable activities.

Although many religious buildings in disuse are located in areas far from the cities, in isolated locations, suitable for meditation and prayer, there are frequent cases of churches in disuse located in the center of the cities. In fact, the church was the center of the social life of the city, so that almost all the historical centers in Europe has been developed concentrically with respect to the most important church of the city.

The urban centrality of a religious building was a direct consequence of the uses that were added to the religious function. Not infrequently, for example, the arcade on the ground floor was rented to merchants or notaries which paid expensive rents in order to stay in a prestigious place. In Milan, in the portico of the Basilica of St. Ambrogio, activities related to commerce and politics were stably carried out [23].

The presence of religious buildings in disuse within urban contexts is an element of degradation, which requires to identify new functions for these properties. The effectiveness of redevelopment projects of public properties is achievable satisfying the needs of three stakeholders: the local Public Authorities, responsible for the supervision of the urban regulations; private investors, carriers of *know-how* and financial resources necessary for the implementation of the projects and, on the other hand, interested in the profitability of the projects developed; potential users of the properties valorized, ultimate beneficiaries of the choices of public and private operators. In this sense, the new functions of these properties cannot ignore the territory of reference and the relationship with the local stakeholders.

Although there is interest in the valorization of properties in disuse, private investors show caution to participate financially in the redevelopment of religious buildings in disuse. This attitude is determined both by the high costs associated with the recovery of these properties [24, 25] and by the presence of historical and architectural constraints that require the preservation at the expense of an effective enhancement.

Several Authors have analyzed the effects of the identification of a building as a property characterized by cultural values. The designation of *cultural* property can determine different effects, both negative and positive. A major downside is the limitation of property rights of the ownership. A positive aspect is the possibility to use various forms of tax deduction [26]. The effect of the designation

of *cultural* property depends on the territorial importance recognized to the building: a positive influence is generated by a "national" designation, but a negative effect is produced by a "local" designation [27].

Moreover, religious buildings are also characterized by ecclesiastical restrictions, that require an "eminently social" function of the religious property to be converted. Furthermore, the cogency of the ecclesiastical constraints, that is the recognition of the social utility to the new functions provided in the religious building to be redeveloped, can lead to a dilation of the bureaucratic process required to obtain the planning permission. In cases where public funds are provided for the recovery of these properties, the respect in the timing of the expenditure of the resources allocated can be jeopardized by the artificiality of the authorization procedures of the local Public Administration.

Finally, if there are a lot of concrete cases of religious properties in disuse located in the center of the city that constitute compromise solutions between the objectives of profitability of private investors and the needs of cultural and ecclesiastical preservation, it is not the same for religious buildings located far from the cities. In these cases, the interest of private investors can be activated: 1) by providing highly profitable functions (shopping centers, housing, clubs, etc.), always coherent with the historical matrix of the properties; 2) by inserting the properties in a circuit of social activities (museums, conference halls, cultural centers, educational institutions, etc.), in order to define a financially self-sustaining system of functions.

5 The model

In the current economic situation, characterized by the scarcity of public funds and the need to optimize the allocation of available resources, it is essential to involve private investors in the initiatives of valorization of the territory.

Religious buildings in disuse, especially for large surfaces that generally characterize them, represent assets able to simultaneously have different uses. This peculiarity will be more or less exploitable in relation to the location of the property, the type of construction, the urban regulations, the eventual ecclesiastical and cultural constraints that may limit the uses.

In current literature, definitions of the *highest and best use* agree on the conditions of technical, legal, financial and economic function which is

responsible for the highest transformation of market value [28].

The highest and best use includes the *concession and lease* of the property to be enhanced. The use of PPPs procedures allows the public Entity responsible for the redevelopment of the property, on the one hand, to transfer to a private investor the costs of recovery; on the other hand, to entrust the management of the property enhanced to private entrepreneurs that routinely operate in the sector of reference of the new uses identified and therefore more commercially relevant [29]. The monetary return for the Public Administration owner of the property to be valorized is the annual rent paid by the concessionary and the *reversion value*, that is the market value of the property at the end of the concession period. This modality of valorization of the property is particularly suitable for assets characterized by functions and surfaces that have a high risk of business, such as to make the concession more attractive than the purchase for private investors.

Different types of PPPs have been practiced in worldwide infrastructure development with different results, and a variety of problems has been encountered. A number of factors combines to determine the success or failure of an infrastructure project in terms of its objectives [30].

Generally, PPPs models reported in the literature are characterized by the following conditions [10]: i) the Public Administration transfers a property to the private investor, with or without the payment of a fee for the duration of the agreement between the two; ii) the private investor transforms, expands or upgrades the property; iii) the Public Administration clearly specifies the services provided; iv) the services are provided by the private investor through the management of the property for a specified period of time (usually with restrictions on tariffs and operational standards) until the asset is not transferred back to the Public Administration.

The fixed term sale of the surface rights is a PPPs model widely used in the countries of the Commonwealth. This option provides that the owner of the property (*free holder*) grants to another entity - generally a company – the surface rights through a *head lease* contract. The concessionaire divides the *head lease* in a series of lease contracts, each relating to a portion of the property. The initial contract requires the payment of a "one-off" sum and of a *ground rent*, that is then repeated in the various lease contracts.

Another contractual type of partnership used in practice is the *Build, Operate and Transfer* (BOT), that is a pure concession model, in which the

remuneration of the service offered by the private investor (in place and under the control of the Public Administration) is charged to the end-users. The BOT provides that the private investor builds or valorizes the asset, financing and managing it for a profit and then transfers it back to the Public Administration at the end of the concession [31]. Previous studies have implemented various techniques and methods, mainly suggesting proper organization structure, contracting procedures, methods of project financing, and risk allocation strategies when BOT-contract projects are realized [32, 33, 34].

Several authors have developed stochastic approaches [35], artificial intelligence models [36] or fuzzy logic systems [37, 38], for determining a proper concession period that can ensure the interests of both the government concerned and private investors.

Clarified the benefits of the modality of valorization in PPPs, the present paper aims to develop and test an innovative assessment model, compared to the methodologies implemented so far. These models, indeed, exclude *a priori* the possibility of the sale of the public property, assuming as paradigm the greater convenience of a Public-Private Partnership, and defining quantitative methods – sometimes rather complex – that optimize the process of realization and management of PPPs.

The model developed in this paper, instead, considers the *concession and lease* as well as the *sale* and, by comparing the benefits through a financial approach, allows to identify the best solution for the public Entity and the private entrepreneur involved in the valorization of a building in disuse.

5.1 Assumptions

The assumptions underlying the model are the following:

a) during negotiations for an agreement on the exchange price (both in the sale or in the concession and lease of the property), there is the *bilateral monopoly* market. In fact, a possible equilibrium cannot be derived from an analysis carried out in terms of the marginal-productivity theory, that is through the curves of demand and supply and those of marginal costs and marginal revenues. Since these assets are not reproducible, in these cases these curves would be in a quadrant that has the quantity on the *x*-axis and the price on the *y*-axis, with the quantities infinitely rigid, as vertical rays in opposite directions (the supply upward, starting at

the minimum selling price; the demand downward, starting at the maximum selling price) [39];

b) possible non-economic factors that determine the exchange have been neglected; i.e. a possible psycho-sociological variable that could affect a greater or lesser propensity to the exchange has not been taken into account [40];

c) a perfect symmetry of information has been assumed. Each of the two contracting parties knows the economic capacity of the other and is therefore able to measure the bargaining power, or - more realistically - this information is known to the expert called to value the equilibrium price or to mediate between the contracting parties.

5.2 The model in case of sale of the property

In bilateral monopoly, in which the solution is indeterminate in the first analysis, the only evident statement which can be made concerns the possibility that the exchange will be realized or not. Recalling the scheme of Edgeworth box [41], known the maximum price level that the demand is willing to pay and the minimum price level that the supply is willing to accept, an indispensable condition to activate the negotiations is that the first is greater than the second. Then, the equilibrium price will be determined by non-economic factors, related to the contractual capacities of the parties. The exchange will be the result of negotiation between the parties, when they reach an agreement about the equivalence of the property with a quantity of money. This equivalence should be referred to two different utility functions, that have different measurement scales. The two parties measure the utility derived from the exchange through the "currency" parameter, but each gives to the money a different marginal utility in relation to the own economic capacity.

The unknowns of the problem are initially three: the maximum price that the demand is willing to pay (P_D), the minimum price that the supply is willing to accept (P_S) and the equilibrium price (P).

The maximum price that the demand is willing to pay (P_D) coincides with the selling price of the property which nullifies the Net Present Value (NPV) of the private investment to the corresponding expected rate of return (r_D).

For the determination of the two remaining unknowns (P_S and P), a system of two equations to define the balance of the weighted utilities of the two parties has been used [42]. The two equations have been obtained through two different approaches for the balance of the utilities of the demand and the supply: one *analytical* and the other *graphical*.

The *analytical* approach considers the financial benefits for the two parties in the hypothesis that the sale of the property is realized for a price P in the range $[P_S; P_D]$. The financial benefit of the demand is given by the amount of money saved by the buyer purchasing the property for a price P lower than the maximum willingness to pay P_D. The financial benefit of the supply corresponds to the additional value obtained from the difference between the price P and the economic sacrifice supported in the case the sale is fulfilled; this sacrifice is equal to the sum of the minimum willingness to accept (P_S) and the accumulation of annual costs ($C = \frac{c}{r}$) for the conservation of the property. In Eq. (1) and (2) the financial benefits for the two parties have been reported:

$$Benefit\ of\ the\ demand = P_D - P \qquad (1)$$

$$Benefit\ of\ the\ supply = P - (P_S + C). \qquad (2)$$

In order to compare the utilities of the two contracting parties - measured in terms of financial benefits resulting from the exchange - the respective values of these benefits have been weighted through suitable coefficients (r_D and r_S), that represent the different contractual capacities of the two parties, i.e. rates corresponding to different and subjective opportunity costs of the demand and the supply.

In the *graphical* approach the equilibrium for the demand and the supply has been determined by solving the equation of the intersection point of the respective utility functions, assumed linear and with slopes proportional to the corresponding contractual capacities. The boundary conditions that determine the rules of variation of the utility functions for the two parties have been borrowed from the economic logic underlying the model: i) in the bilateral monopoly, the locus of possible values of the utility functions is defined as the range of the eligible limit prices ($[P_S; P_D]$); ii) the utility of each of the two economic entities is maximized (more accurately, it tends to infinity) where the equilibrium price coincides with the respective expected price; iii) if the two parties have the same contractual capacities ($r_D = r_S$), the transactional activity of the demand is ineffective, then the equilibrium price coincides with the maximum price that the demand is willing to pay ($P = P_D$); iv) if the contractual capacity of the supply is low ($r_S \approx 0$), the equilibrium price coincides with the minimum price that the supply is willing to accept ($P = P_S$). The constraints described above are satisfied if the utility functions are algebraically represented by Eq. (3) and (4):

$$Utility\ of\ the\ demand = \frac{1}{(r_D - r_S)} \cdot (P_D - P) \qquad (3)$$

$$Utility\ of\ the\ supply = \frac{1}{r_S} \cdot (P - P_S) \cdot \qquad (4)$$

Table 1 shows the two equations that represent the balance of the utilities for the two contracting parties, obtained by the analytical and graphical approaches in the case of sale of the property. The meaning of the terms has been explained by definitions given in Table 2.

Analytical approach	$\dfrac{P_D - P}{r_D} = \dfrac{P - (P_S + C)}{r_S}$
Graphical approach	$\dfrac{1}{(r_D - r_S)} \cdot (P_D - P) = \dfrac{1}{r_S} \cdot (P - P_S)$

Table 1 - Equations of utility functions for demand and supply in case of sale of the property

The equilibrium price (P) has been determined by solving the system of two equations of Table 1 with the two unknowns P and P_S:

$$\begin{cases} P = P_D + \left[\dfrac{r_D}{r_S} - \left(\dfrac{r_D}{r_S} \right)^2 \right] \cdot C \\[4mm] P_S = P_D - \left(\dfrac{r_D}{r_S} \right)^2 \cdot C. \end{cases} \qquad (5)$$

P	equilibrium selling price for the demand and the supply
P_D	maximum selling price that the demand is willing to pay
P_S	minimum selling price that the supply is willing to accept
r_D	expected rate of return on the investment for the demand
r_S	expected rate of return on the investment for the supply
c	annual expenses supported by the supply for the preservation of the property
r	accumulation rate of the annual expenses of maintenance

Table 2 - Model parameters in case of sale of the property

When the property belongs to a public Entity (municipality, region, etc.), it is usually accepted

that the contractual capacity of the demand is higher than the capacity of the supply ($r_D > r_S$). Assuming that the relationship between the two economic capacities determines the nullification of the minimum price that the supply is willing to accept $(P_s \cong 0)$, the equilibrium price given by Eq. (6) has been obtained by solving the system of Eq. (5):

$$P = \sqrt{P_D \cdot C} \ . \tag{6}$$

5.3 The model in case of concession and lease of the property

With reference to the analytical approach described above and in the case that the modality of *concession and lease* is preferred to the *sale* of the property, if the utility function of the demand - unless the different meaning of the terms - does not change, the financial benefit of the supply includes, in positive, the appreciation of the value of the property - whose the supply continues to hold the ownership – during the concession period; in negative, the selling price that has been refused following the decision to retain the ownership of the property.

Therefore, in case of concession and lease of the property, the financial benefits in Eq. (1) and (2) have been modified due to: the different meaning of the prices (i.e. *lease* prices); the appreciation of the value of the property, which will be renovated for the new function provided, at the end of the concession period established; the accumulation of the annual expenses of conservation of the property for a "limited" time, equal to the concession period; the sacrifice of the supply related to the decision to hold the ownership of the property, that is equal to the equilibrium selling price P.

Finally, in case of concession and lease of the property, the financial benefits of the two parties have been represented by Eq. (7) and (8):

Benefit of the demand $= P_{lease,D} - P_{lease}$ (7)

Benefit of the supply $= G + P_{lease} - (P_{lease,S} + C_{lease} + P)$. (8)

The meaning of the new terms of Eq. (7) and (8) has been synthesized in the definitions of Table 3.

Starting from the Eq. (7) and (8) and tracing the development of the analytical approach, the system (5) has been modified in Eq. (9):

$$\begin{cases} \mathsf{P}_{lease} = P_{lease,D} + \left[\dfrac{r_D}{r_S} - \left(\dfrac{r_D}{r_S} \right)^2 \right] \cdot (P + C_{lease} - G) \\[4mm] P_{lease,S} = P_{lease,D} - \left(\dfrac{r_D}{r_S} \right)^2 \cdot (P + C_{lease} - G) . \end{cases} \tag{9}$$

The maximum concession price that the demand is willing to pay ($P_{lease,D}$) coincides with the accumulation of the annual rents that nullifies the NPV of the private investment for the corresponding expected rate of return (r_D), taking into account the items of cost and revenue in case of concession and lease of the property.

$P_{lease,D}$	maximum price that the demand is willing to pay in case of concession and lease of the property
P_{lease}	equilibrium price for the demand and the supply in case of concession and lease of the property
$P_{lease,S}$	minimum price that the supply is willing to accept in case of concession and lease of the property
$G = (P + Cv) \cdot \left[\dfrac{(1 + r_g)^n}{(1 + r)^n} - 1 \right]$	appreciation of the value of the property to be enhanced at the end of the concession period
Cv	cost of valorization of the property
$C_{lease} = c \cdot \dfrac{q^n - 1}{r \cdot q^n}$	minimum maintenance cost of the property to be supported during a time equal to the concession period, if it was preserved in the present conditions
r_g	appreciation rate of the property
n	concession period

Table 3 - Additional parameters of the model in case of concession and lease of the property

Eq. (9) is a system of two equation in two unknowns P_{lease} and $P_{lease,S}$. The equilibrium selling price P is determined by the system (5).

If the owner of the property is a public Entity $(P_{lease,s} \cong 0)$, the equilibrium concession price is given by Eq. (10):

$$P_{lease} = \sqrt{P_{lease,D} \cdot (P + C_{lease} - G)} , \tag{10}$$

with P determined through Eq. (6).

In the case the ownership of the property is represented by a Public Administration, Eq. (10) must be used to determine the equilibrium concession price. Then, estimated the parameters required for the application of the model, it is possible to identify the most convenient modality of valorization of the property - *concession and lease* or *sale* - for both contracting parties. This result is achieved by comparing, for the supply, the values $P_{lease} + G$ and P; for the demand, the values P_{lease} and P.

Therefore, there can be the following four cases.

Case 1

$$\begin{cases} P_{lease} + G > P \\ P_{lease} < P \end{cases}. \tag{11}$$

This case occurs when the *concession and lease* is the best modality of valorization for the supply and the demand. Indeed, for the supply the sum between the equilibrium price in case of *concession and lease* and the appreciation of the property value is higher than the equilibrium selling price; for the demand, the equilibrium concession price is less than the equilibrium selling price.

Case 2

$$\begin{cases} P_{lease} + G > P \\ P_{lease} > P \end{cases}. \tag{12}$$

In this case, if for the supply the *concession and lease* is still the most profitable modality of valorization, the demand prefers the *sale*, being the equilibrium selling price less than the equilibrium concession price. In this situation, the supply must compare the difference $P_{lease} - P$ with the value G.

If $P_{lease} - P < G$, then the demand will accept the *concession and the lease* only if the concession price P_{lease} is set equal to the selling price P.

However, if $P_{lease} - P > G$, the supply should agree on the *sale*, but at the same time it could try to negotiate the selling price with the demand according to the results obtained through the model developed.

Case 3

$$\begin{cases} P_{lease} + G < P \\ P_{lease} > P \end{cases}. \tag{13}$$

This condition only occurs if G is negative (i.e. $r_g < r$). For both parties the *sale* of the property is the most convenient solution.

Case 4

$$\begin{cases} P_{lease} + G < P \\ P_{lease} < P \end{cases}. \tag{14}$$

This is the reverse situation of Case 2: the supply should sell, the demand should acquire the concession of the property. This condition can occur when the demand is characterized by a high expected rate of return (r_D) on the investment and G is negative ($r_g < r$) or characterized by a very small value $(r_g \cong r)$. As in Case 2, the supply could use the results of the model to negotiate the concession price.

Finally, the model proposed in (10) has a plausible solution if:

$$P + C_{lease} - G > 0, \tag{15}$$

that is

$$P + C_{lease} > G. \tag{16}$$

In fact, if this condition is not verified - for example, due to costs of valorization of the property too high compared to the other items of the equation - the supply would obtain a substantial financial return even from the *free concession* of the property to be enhanced. In this situation, the supply would take greater advantage from the *concession* respect to the *sale*, whatever is the concession price established.

On the other hand, the demand will have to carefully assess the solution and the prices that ensure a good return on investment.

6 Applications of the model

In order to verify the reliability of the model developed, three concrete cases for its application have been considered. These are three religious buildings in disuse located in different cities of Southern Italy (Palermo, Naples and Trani); for each of them, the local Authorities have identified new functions (cinema, four-star hotel, nursing home), compatible with the ecclesiastical and/or cultural constraints of the properties. Although these properties are characterized by cultural values, the sale to private investors is possible. The new functions identified maximize the public convenience (the highest economic impacts), both in

the case of sale and in the case of concession and lease of the properties.

In Table 4 the technical and economic characteristics of each religious property in disuse considered have reported.

The religious building in Palermo consists in a church with a sacristy, in a state of abandonment, realized in the nineteenth century, for which the functional conversion in a cinema with two hundred seats, bar and wardrobe service is provided. The investment costs take into account the recovery of the property and its transformation for the new function. In particular, the expenditure items that define the investment costs, equal to € 1,064,000, are: costs of structural recovery and restoration of the architectural values of the property; costs for the construction of electrical, sanitary and air conditioning systems; costs for the construction of the coatings of the cinema room; costs for furniture, screens, video-projectors and armchairs.

The property in Naples is a church and annexed convent of the eighteenth century. The highest and best use identified by the Public Administration, in consultation with the various local stakeholders, is a four-star hotel with twenty-seven rooms, bar and meeting room. The investment costs, equal to € 2,150,000, involve the renovation of the complex with the realization of finishes and services related to a four-star hotel and the purchase of furniture.

The property in Trani is also a church and annexed convent of the eighteenth century, to be used as a nursing home with fifty inpatient beds. The sum of costs of rehabilitation of the compendium and the purchase of furniture is equal to €1,900,000.

Revenues and operating costs have been derived from studies of Associations - SIAE (Italian Society of Authors and Editors) for the cinema in Palermo; AICA Observatory (Italian Association of Hotel Companies) for the hotel in Napoli; AUSER (Self-Management Services) Report and "Health for All" data from ISTAT (Italian Institute of Statistics) for the nursing home in Trani - and from the surveys carried out on the competitors operating on site. Therefore, for the cinema in Palermo, revenues at full capacity (€ 254,400) have been determined assuming 20,000 visitors a year, the price of the ticket at the box office equal to € 6.36 and other revenues (100%) from bar, wardrobe services, advertising services, sponsorships, filming and public and private funds; operating costs (€ 85,120) include the costs of the employees, SIAE license, utilities, supplies for the bar, the amortization of machinery and financial charges.

For the four-star hotel in Naples, revenues at full capacity (€ 875,000) have been estimated through an average room price of € 110 per day, an occupancy rate of 65% per annum, to which other revenues (25%) resulting from the bar service and the renting of the meeting room must be added; operating costs (€ 430,000) are related to the employees, promotional activities, supplies for the bar, utilities, ordinary maintenance, amortizations and financial charges.

For the nursing home in Trani, revenues at full capacity (€ 780,000) have been estimated considering an average price of an inpatient bed equal to € 50 per day and an occupancy rate of 85.57%; operating costs (€ 410,000) concern employees, utilities, purchase of diagnostic and sanitary products, medicines, supplies for catering, external consultants, medical services and transportation costs.

	Palermo	Naples	Trani
Gross floor area (m^2)	1,000	2,000	2,450
New function	Cinema	Four-star Hotel	Nursing home
Investment costs (€)	1,064,000	2,150,000	1,900,000
Revenues (€)	254,400	875,000	780,000
Operating costs (€)	85,120	430,000	410,000

Table 4 - Technical and economic characteristics of the case studies analyzed

In Table 5 the amounts of the parameters required for the implementation of the model have been reported. Assuming "2014" as the year "zero" for the evaluation, for the three case studies a concession period (n) equal to 20 years has been considered.

	Palermo	Naples	Trani
n		20	
r		1.23%	
r_g		2%	
c	2,000	3,000	5,000
r_D	8.5%	7.5%	8%

Table 5 - parameter values for the three case studies analyzed

The accumulation rate r has been assumed to be equal to the average rate of return of twenty-year Italian Treasury Bonds (3.23%), adjusted for the expected inflation rate (2%). The appreciation rate r_g has been assumed to be equal to 2%: although forecasts [43] have not been positive for the real estate market in 2014, the adoption of a minimum appreciation rate allows to justify, from a financial point of view, the possible public preference for the *concession and lease* respect to the *sale* of the property, in the case the equilibrium concession price is significantly lower than the equilibrium selling price. Considering that the properties in analysis are in complete abandonment, the annual costs for their preservation (c) are low and equal to €2,000 for the property in Palermo, €3,000 for the complex in Naples and €5,000 for the compendium in Trani. The expected rate of return for the private investor (r_D) has been estimated according to the specific conditions of the local market of reference for each property, the size and the intended uses provided (8.5% for the property in Palermo, 7.5% for the complex in Naples and 8% for the compendium in Trani).

The assessment of the maximum selling price that the demand is willing to pay (P_D) has been performed, for the three case studies, through the following assumptions: an analysis period of the investment equal to 20 years; revenues at full capacity from the fifth year of the analysis period, while in the first four years growth rate of revenues respectively equal to 0 in the first year, 0.40 in the second year, 0.60 in the third year and 0.80 in the fourth year; a residual value at the twentieth year equal to the initial costs of investment depreciated by 25%.

In Table 6, for the three case studies analyzed, the maximum prices that the demand is willing to pay in case of *sale* (P_D) and *concession and lease* ($P_{lease,D}$), the minimum maintenance cost sustained by the public Authority in the case of preservation of the property in the present conditions (C), the equilibrium prices P and P_{lease} and the appreciation of the value of the property valorized (G) have been reported.

The comparison of the results highlights that, for the properties in Palermo and Trani, the *concession and lease* is the best modality of valorization for both contracting parties. Indeed, in both cases, for the supply, the sum $P_{lease} + G$ - equal to €336,400 for the property in Palermo and €880,425 for the property in Trani - is higher than the corresponding equilibrium selling price P (respectively equal to €247,050 for the property in Palermo and €660,440

for the property in Trani); for the demand, the equilibrium concession price P_{lease}, equal to €121,900 for the property in Palermo and €598,235 for the property in Trani, is less than the equilibrium selling price P (Case 1).

	Palermo	Naples	Trani
P_D	375,350	1,635,130	1,073,019
$P_{lease,D}$	219,250	1,255,520	767,290
C_{lease}	35,270	52,900	88,170
P	247,050	631,510	660,440
P_{lease}	121,900	714,800	598,235
G	214,540	277,450	282,190
Modality of valorization	Concession and lease (Case 1)	Concession and lease with $P_{lease} = P$ (Case 2)	Concession and lease (Case 1)

Table 6 - results of the application of the model for the three case studies

However, for the property in disuse in Naples, if the sum $P_{lease} + G$, equal to €992,250, is still higher than the equilibrium selling price P, equal to €631,510, i.e. the *concession and lease* remains the most convenient modality of valorization for the supply, the demand prefers to purchase the property, being $P_{lease} = 714,800 > P$ (Case 2). In this situation, in order to activate the valorization of the property, for the public Entity is more convenient to accept a concession price equal to the equilibrium selling price ($P_{lease} = P$).

7 Conclusions

The economic slowdown determined by the current crisis requires European countries to reduce their public debt and to enact reforms in order to favor a rapid economic recovery.

In Italy, in the last few years several laws have been promulgated that are aimed, at the same time, to valorize cultural public buildings in conditions of current neglect and to attract private investments in the management of public properties.

With particular reference to religious buildings in disuse, located in many historical centers, in this paper the causes (costs of recovery, cultural constraints, ecclesiastical restrictions) that can

decelerate the process of renovation of a generic public property have been described and the procedural phases that lead to the identification of the optimal function to assign to public properties have been outlined. Considering two modalities of valorization (*concession and lease* and *sale*) of the public property, a decision support model that identifies the solution capable to maximize the convenience for both the supply (Public Entity) and the demand (private investor) has been developed.

The algorithm has been applied to three concrete cases, concerning religious buildings in disuse located in three cities in Southern Italy (Palermo, Naples and Trani). The analysis carried out has highlighted in all three cases the preferability of the *concession and lease* as the optimal solution of valorization for the demand (private investor) and for the supply (Public Administration).

Indeed, for the cases analyzed, the real internal rate of return (IRR_{real}) generated by the investment for the private entrepreneur, determined by considering the actual concession price obtained by the model, is higher than the expected rate of return for the demand: 9.66% (>8.5%) for Palermo, 10.19% (>7.5%) for Naples and 9% (>8%) for Trani; the Public Administration achieves instead, from a financial point of view, a fair payment for the concession of the property and the likely appreciation of the value of the property enhanced at the end of the concession period; from the point of view of the collectivity, the public Entity obtains the reactivation of a public property in disuse that, in the absence of private funds, would be in a state of permanent abandonment, precluding the direct and indirect benefits that may result.

Furthermore, in order to effectively allocate European funds, the model developed allows to identify those cultural attractions financially "hot", i.e. public properties to be valorized through new uses for which the considerable positive difference between IRR_{real} and r_D can justify a direct performance of the enhancement through public funds. Therefore, in these cases, the management of the property valorized will be entrusted to the private entrepreneur to a concession price more profitable than the equilibrium concession price obtained by the application of the algorithm.

The model does not consider the positive externalities for the collectivity generated by the valorization of the cultural property, but it only takes into account the financial effects related to the recovery and the management of the building. However, the flexibility of the algorithm allows to broaden the horizon of the evaluation, by simply integrating the variable G through any additional economic effects.

The model is characterized by a simple and immediate use and can be used for any type of public property that deserves adequate enhancement.

Further studies will derive certainly from the application of the model to several public properties in disuse of the same typology and geographical context. In this case, if a statistically significant sample is defined, the assumptions underlying the model, as well as the degree of confidence by which the results achieved through the model can be inferred to the whole population of the properties to be enhanced, can be verified using the appropriate statistical tests (e.g. X-Square test, t-student test).

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