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The Public–Private Partnership for the Enhancement of Unused Public Buildings: An Experimental Model of Economic Feasibility Project

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Abstract: This article is part of the debate on the economic evaluation of urban regeneration projects to be implemented through partnership forms between public and private subjects. It illustrates the results of the research activity carried out by the authors, aimed at developing innovative tools to verify the economic feasibility and the sustainability of projects for the reuse of unused public buildings. Particularly, the study made it possible to develop an experimental model of economic feasibility project to be used in the. The model aims at verifying if the economic conditions are satisfied, and which ones, if any, are appealing for the private involvement within the realization and/or management of collective utility interventions. Significant points of the model are: (1) The inclusion of real estate re-use projects in the wider context of urban and territorial regeneration; (2) the adoption of criteria to assess costs and revenues remarkably eligible, in the authors' opinion, to understand the effective economic feasibility and/or sustainability of reuse projects, even under the framework of reliable techniques as the 'Cash Flow Analysis' and the 'Discounted Cash Flow Analysis'.

Keywords: economic feasibility; economic sustainability; project feasibility investment profitability; unused public buildings

1. Introduction

Nowadays, the inadequacy of public resources availability for the exploitation of unused public buildings, similarly to what happens to other sectors of the Public Administration, leads to seek for innovative solutions that allow to pursue the economic improvement of those buildings [1]: Following that purpose, some public-private partnerships might be considered useful relevant to those who work in the field of services of architecture and engineering.

Such partnerships, the need to guarantee the economic-financial balance in the processes of valorization of real estate becomes fundamental.

At the moment, the prevailing approach for such questions draws the methodological basis from disciplines dealing with the economic dynamics of companies. This approach allows us to evaluate the expected revenues properly, but it shows some weaknesses in terms of cost estimation, as it will be deepened ahead in the article.

In the last decades, the estimation culture in Italy has contributed significantly to develop methodologies and techniques economic evaluation of the projects, starting from its classical scientific base and enriching it with contributions coming from other related disciplines. It is to this relatively recent disciplinary evolution that this work intends to connect.

This contribution objective is to provide an easy-to-use tool in order to verify the feasibility and the economic sustainability of hypotheses of re-use of buildings unused public, in case it is intended

to involve private subjects for the realization and/or management of the interventions. The model explained below can also be used in the case of important architectural heritage, but it is not intended for residential target or for regeneration initiatives entirely carried out by public bodies [2].

It is to be hoped that this approach can be of help to the decision-making process, from the start-up phase of the planning activity, matching with the technical and the economic feasibility project, under the Italian law.

Part First—Public–Private Partnerships for the Exploitation of Unused Public Buildings

2. The Cooperation between Public and Private Subjects

2.1. The Technical and Economic Feasibility Project

The technical and economic feasibility project as a level of planning was introduced by the Code of public contracts (otherwise known as “Procurement Code”), as regulated by the Legislative Decree 18 April 2016 n. 50 e s.m.i. [3]. It replaces two design levels previously provided for by the legislation, the feasibility study and the preliminary project. Similar tools for verifying the feasibility of projects are also present in the legislation of many OECD countries, such as Canada, Germany and France.

The Article 23—Levels of the project for the procurements—establishes that planning for public works is organized, according to three levels of subsequent technical in-depth analysis: the technical and economic feasibility of the project, the final project, and the executive project.

The technical and economic feasibility project, according to the provisions of paragraph 5 of the art. 23, identifies, among several solutions, the one that presents the best balance between costs and benefits for the community, in relation to the specific needs to be met and the services to be provided.

2.2. The Public-Private Partnership

The cooperation between public and private subjects to realize works and provide public utility services is an old matter. Even at the time of the ancient Roman Republic, it was a common practice to grant private citizens for the provision of public services and, often, for the achievement of works useful to the purpose of the allowance itself [4].

The current legislation on public works, in force as of March 2018, refers to Legislative Decree 18 April 2016 n. 50 “Codice dei contratti di appalto e di concessione delle amministrazioni aggiudicatrici e degli enti aggiudicatori aventi ad oggetto l’acquisizione di servizi, forniture, lavori e opere, nonché i concorsi pubblici di progettazione”, as amended by D. Lgs. 19 April 2017, n. 56.

Article n. 180 of the Code above mentioned regulates, the public–private partnership contract, as defined in art. n. 3: The agreement for pecuniary interest, stipulated in writing, with which one or more contracting stations, grant one or more economic operators, for a fixed period, depending on the duration of the amortization of the investment or the financing methods established, a complex of activities consisting in the realization, transformation, maintenance and operational management of a work, in exchange for its availability, or its economic exploitation, or the provision of a service that is connected to the use of the work itself, with risk-taking according to identified methods in the contract, by the operator.

According to the Department for Regional Affairs of the Presidency of the Council of Ministers, the enhancement of public real estate assets can represent an important opportunity to trigger urban regeneration processes and to promote local development: It must be approached as a logical consequence of the primary declination of an idea of city and territory, that must be well defined in the purposes of public decision makers. In this context, some arguments are hinged that describe administrative revolution, implemented in Italy with the entry into force of law no. 56 of 7 April 2014 (Delrio law) “Provisions on metropolitan cities, on Provinces, on unions and mergers of Municipalities”. It means to consider city and territory, and the enhancement of public real estate assets as a conceptual “unicum”. A coherent idea of the city will also be based on careful development of the public real estate and vice versa a good action of development is certainly part of a coherent idea of a city [5].

2.3. A Classification of Subjects' Nature, Activities and Costs

As previously highlighted, Public Administration searches forms of PPPs with increasing frequency, to satisfy the needs of the local communities, while respecting the growing budget constraints.

The most important distinction, when considering involving private entities into partnership agreements with the Public Administration, is among the characteristics of the expected activities, not among the subjects (Table 1): There are, in fact, numerous cases of the subject with not-for-profit nature, but that carry out economic activities. In such cases, the cost structure between a not-for-profit or profit subject does not change, but the tax regime to which they are subordinate; in addition, of course, the prohibition for not-for-profit organizations to distribute profits [6–8].

Table 1. Nature of entities and of activities.

Nature of Activities	Nature of Managing Subject
Public services	Public
Activities of public interest without economic relevance	Private not-for-profit
Activities of public interest with economic revenues, such to be considered economic activities	Private not-for-profit Private for-profit

Each type of subject identified has different characteristics. In the case of public bodies, it is well known the firmness along with the management phase, due to procedural constraints imposed by the current legislation, which is often associated with the difficulties to acquire the necessary skills. The private for-profit entities normally are characterized by greater operational efficiency, which, however, must match an adequate return on investment, with the risk to overshadow the community's interests, which should be prominent in the case of public interest services management; furthermore, these subjects have a cost structure characterized by high fixed expenses for human resources. The not-for-profit organizations arise from determined values shared by the members: Usually, these subjects carry out volunteer activities without economic relevance, but they also have the opportunity to manage economic activities linked to their objectives. In organizational terms, they are characterized by an intermediate level of efficiency between public entities and private for-profit, due, on the one hand, by the absence of the procedural constraints typical of public bodies, on the other hand by the voluntary nature of members participation, when it comes without economic returns activities (Table 2) [9].

Table 2. Features of managing subjects.

Managing Subject	Features
Public	<ul style="list-style-type: none"> • Management rigidity • Growing budget constraints • Lack of adequate skills • Managerial management logics • Fair flexibility
Private for-profit	<ul style="list-style-type: none"> • Need for adequate revenues • High fixed costs for human resources • Poor attention to public interests • High flexibility
Private not-for-profit	<ul style="list-style-type: none"> • Presence of appropriate skills • Moderate fixed costs of management

Private entities involvement, with the purpose of cultural heritage enhancement, contributes to focus the attention on the economic dimension of these processes, since it entails the need for such subjects to maintain the financial feasibility of businesses and, in the case of for-profit activities, to ensure adequate levels of profit.

The purpose of this paper is precisely to verify the conditions that ensure the economic and financial balance in the enhancement processes in the public-private partnerships, in relation to managing entities with different nature, which are associated with different management models: For that aim, therefore, it is particularly important to understand how the cost structure changes if management models change too, while we can consider invariable the structure of revenues.

2.4. Kinds of Entities and of Activities

Considering different kinds of activities and managing entities, we can suppose the three following models (Table 3):

Table 3. Managing models by type of subject.

Managing Model	Kinds of Entity and Activities
Model P—Profit	For-profit Entity, for-profit activity
Model NP—Not-for-profit	Not-for-profit Entity, not-for-profit activity
Model M—Mixed	Not-for-profit Entity, for-profit activity

The first model does not require an in-depth analysis: It responds to the classical model of business entities, for which the economic and financial balance occurs only if an adequate level of profit is ensured. Given the fixed costs for human resources that characterize it, this model is inapplicable where the business volume is not so significant as to generate substantial revenues.

In the not-for-profit model, the managing entity, carrying out not-for-profit activities, benefits from the volunteer commitment of the members and other parties at no charge except in certain cases, in addition to the reimbursement of any costs incurred. Another significant cost item for human resources, absent in this model, is the management, of the production aspects [10]. Thereby, the fixed cost of human resources is greatly reduced, sometimes transforming this type in variable cost (being occasional performances), significantly reducing the operating costs in the case of limited flows of users (Figure 1). It is a working model when a community considers a given asset particularly important, but its management does not generate sufficient revenues to cover the operating costs for the entity involved.

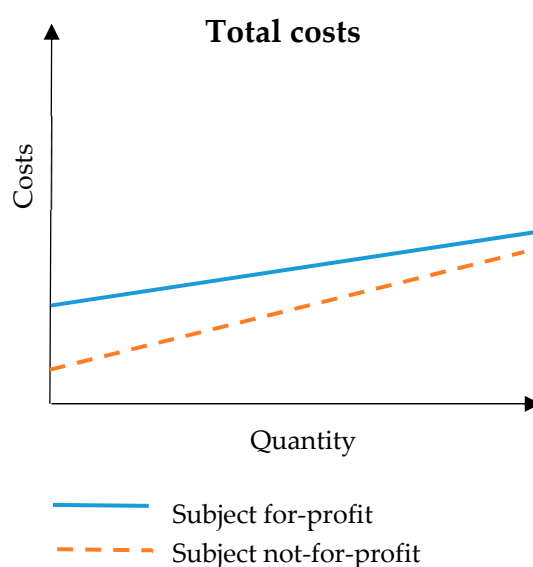


Figure 1. Trend of total costs by type of subject.

In the mixed model, however, the subject not-for-profit, carries on activities with significant revenues. In that case, it can be compared to a for-profit subject, in terms of cost structure, since the involved human resources have to be paid, as established by law, for those particular tasks. The main

differences are: There is not profit, since any surplus is reinvested in the same activity and it cannot be distributed among members; the cost of the managerial duties can be considered, but is not a constant for the model.

It should be noted that the management model for the same asset can change over time. For example, in the start-up phase, a not-for-profit entity undertakes the management as a volunteer activity. Thereafter, if the demand increases adequately, it can turn the activity into business or acting as a start-up with entrepreneurial purposes.

In both cases, the management model choice does not depend exclusively on the economic and financial equilibrium: Even with adequate profits, it is essential to analyze the territory potential which can be positively exploited through the involved subjects. It may happen, for instance, the lack of entrepreneurial stakeholders to manage a specific asset, or political interests may prevail, and that can act in favor of a particular model.

The economic and financial equilibrium assessment of physical asset management, however, allows the decision maker to make weighted choices, thereby reducing the possibility of failure, also bringing more clearness in the decision-making process.

2.5. The Nature of Costs

Firstly, we suggest a distinction among different types of cost that private entities can sustain, with respect to the development of architectural heritage, essentially referable to two macro-categories [11]: Investment costs and management costs.

In fact, the enhancement of real estate requires a starting investment to make the asset working, including the masonry work and the structures fitting with the safety standards, and the equipment and the facilities for its fruition (Figure 2). With respect to the intrinsic characteristics, the condition of preservation and its future use, such investment may be more unbalanced towards the building works or, conversely, toward equipment and furniture [12,13].

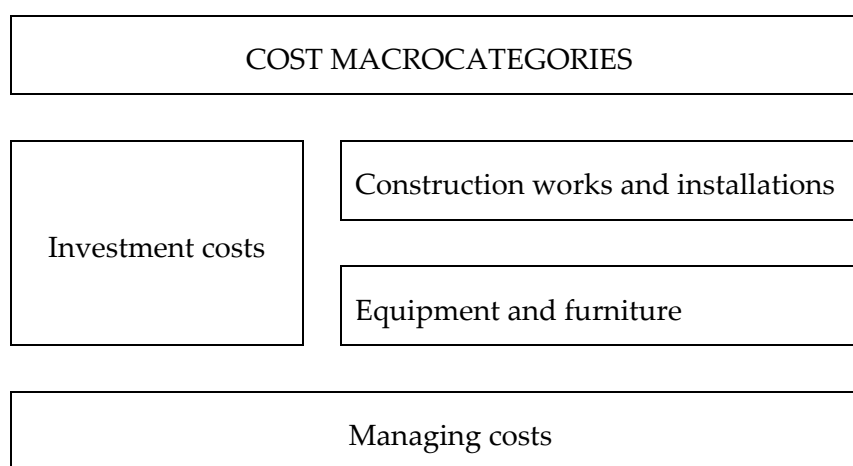


Figure 2. Cost categories for building enhancement.

Once the starting investment is completed, the management phase begins, involving costs, including human resources, utilities, maintenance, depreciation and amortization, and other goods and services [14]. It is to point out that, to assess the economic sustainability of the projects, among the management costs, the depreciation of equipment and furniture and the provisions for extraordinary maintenance, are particularly significant: Following this ratio, the replacement of equipment and furniture and the asset usability over time, are ensured, thus, allowing the sustainability of the initiative.

Operating costs, in turn, can be divided into two categories: Fixed costs and variable costs. Moreover, fixed costs are not related to production volumes, as in the case of the variable costs. Some of

the items listed above are characterized by the presence of a fixed component and a variable, such as utilities or some kinds of human resources.

As seen above, the Human resources item, usually among those with higher incidence, changes significantly following with the different management models: In the case of for-profit activities, for instance, it represents one of the major fixed management costs.

In the case of for-profit subjects, the economic-financial balance occurred only with an adequate level of profit: For this reason, during financial sustainability tests, this item can also be treated as an operating cost and subtracted from revenues.

Part Second—The Economic Evaluation of Feasibility Projects

3. Monetary Evaluations of Projects in the PPP

3.1. The Companies' Balance Sheet: Financial Statement and Cash Flows

The accounting of companies serves to measure exchanges and the relationship with the external environment in monetary and economic terms: The balance sheet represents the summary document.

Information on the accounts has fiscal purposes, but it also serves to assess the company's "state of health" and its activities, reporting any unstable situations.

The Civil Code regulates the accounting report; in particular, the Art. 2423—Drafting the financial statements provides that the managers, annually, must prepare the financial statements, consisting of the balance sheet (art. 2424), the income statement (art. 2425), the cash flow statement and the explanatory note (art. 2427) [15]

The income and the expenses shown in the Cash Flow Statement represent the cash flows actually recorded in the year for the different categories of business of the company. For these reasons, the cash flow report is an analysis of cash flows [16].

We consider cash flows since the economic balance, given by revenues = costs, cannot be achieved daily: While some costs and revenues have a fairly uniform distribution over time, others occur at unpredictable intervals; indeed, some expenses. The flows can be:

- On entry, then we talk about cash inflow;
- Outgoing, then we talk about cash outflow.
- A company's cash flows can be traced back to three categories [17,18]:
- *Operating activity*, which generally includes those operations connected with the purchase, the production, the distribution of goods and the provision of services, even if referable to ancillary operations, as well as other operations not included in the investment and financing activities.
- *Investment activity*, which includes the purchasing and sale transactions of tangible, intangible and financial assets and non-fixed financial assets.
- *Financing activity*, which includes the operations of obtaining and returning cash in the form of risk capital or debt capital.

3.1.1. Operational Activity

Cash flows from operating activities generally comprise the flows coming from the acquisition, the production and the distribution of goods and from the supply services, even if referable to ancillary operations, and the other flows not included in the investment and financing activities.

Some examples of cash flows generated or absorbed by operating activities are:

- Collections from the sale of products and from the provision of services;
- Collections from royalties, commissions, fees, insurance reimbursements and other revenues;
- Payments for the purchase of raw materials, semi-finished products, goods and other production factors;
- Payments for the acquisition of services;

- Payments to, and on behalf of, employees;
- Payments and tax refunds;
- Receipts for financial income.

3.1.2. Investment Activity

The cash flow of the investment activity includes the flows that derive from the purchasing and sale of tangible, intangible and financial assets and not-immobilized financial assets.

By way of example, the financial flows generated or absorbed by the investment activity derive from:

- Purchasing or sale of buildings, plants, equipment or other tangible assets (including tangible assets of internal construction);
- Purchasing or sale of intangible assets, such as patents, trademarks, concessions; these payments also include those relating to capitalized multi-year charges;
- Acquisitions or sale of investments in subsidiaries and associated companies;
- Acquisitions or disposals of other investments;
- Acquisitions or sale of other securities, including government bonds and bonds;
- Disbursements of advances and loans made to third parties and proceeds from refunds.

3.1.3. Financing Activities

The financial flows of the financing activity include those flows deriving from obtaining or compensation of liquid assets in the form of risk capital or debt capital.

By way of example, the financial flows generated or absorbed by the financing activity are:

- Collections deriving from the issue of stocks or units belonging to the risk capital;
- Payment of dividends;
- Payments to refund the risk capital, including the form of the purchasing of treasury stocks;
- Collections or payments coming from the issue or redemption of bonds, fixed-income securities, the opening or restitution of mortgages and other short or long-term loans;
- Increasing or decreasing of debts including those ones in the short or medium term, of financial nature.

3.2. Monetary Techniques for the Economic Evaluation of Projects

A project is only a small part of any private subject activity, being profit or non-profit. The assessment of its sustainability or feasibility aims to verify:

- Its economic-financial balance over time (sustainability);
- Its ability to generate wealth for the person who realizes it (feasibility).

In the first case, it is necessary to identify the equilibrium conditions in the current year, in the second one the entire useful life of the project must be taken into consideration.

The techniques used in the two cases, therefore, differ exclusively for the time-based variable. Thus, for the sustainability assessment, the Cash Flow Analysis (CFA) will be used, for the feasibility forecast, instead, the Discounted Cash Flow Analysis (DCFA).

3.2.1. Balance Evaluation of the Project Management Phase: Cash Flows Analysis

In the case of projects for the enhancement of public buildings that provide, as a form of public-private partnership, only the assignment in management, without the need for investments by private parties, it is sufficient to resort to an examination of cash flows (Cash Flow Analysis—CFA) in the running year, using an analysis structure illustrated later, whose result must be equal to or greater than zero.

3.2.2. Evaluation of the Profitability Evaluation of the Project: Discounted Cash Flow Analysis

Discounted cash flow or discounted cash flow is an evaluation method to assess the investment profitability, based on the current value of flows, according to a risk-adjusted rate, generated by the investment.

Usually, a project implementation does not represent an immediate operation:

- Costs and revenues associated with the transformation are articulated over time;
- Values occurring at different time ranges are not homogeneous, it is, therefore, not possible to make an immediate comparison of costs and revenues, both for a single project and among different projects.

It is, therefore, necessary to address two problems:

- Assessing costs and revenues for each year of the project;
- Making homogeneous balances between revenues and costs, under a shared time reference, reporting them up-to-date events.

The discounted cash flow analysis criterion is based on the economic principle of the anticipation. The main indicators to verify the profitability of investments are the Net Present Value (NPV) and the Internal Rate of Return (IRR).

The models that use discounted cash flow are widely consolidated, both in the international literature, relating to the valuation of real estate investments and in the manuals used for the professional practice, and in the Italian literature [19–22] to which we refer for further details.

The DCFA is considered the standard tool used in the valuation of real estate investments. The theory that supports it is shared within the community of scholars and professionals, and its results depend substantially on the quality of the inputs, which in general applies to any economic model.

However, it is characterized by some critical aspects, often underestimated; first of all, the uncertainty of the future scenario, from the decision-making point of view, despite the deterministic nature of the inputs can be corrected through sensitivity analysis and simulation models. In these analyzes, necessary decision-making flexibility is required with respect to the current economic scenarios, characterized by a high level of uncertainty relative to some of the variables of the system, endogenous, but above all exogenous.

4. Evaluation Techniques and Project Profitability

4.1. Feasibility and Sustainability of Projects

According to some authors [23], project feasibility depends on the conditions for effective cooperation between the actors called to implement it.

A project feasibility is ensured when all the subjects involved reach their goals. In particular:

- The public administration manages to regulate the transformation of the city effectively, and to satisfy the needs of citizens;
- The private profit partner gets a normal market profit from the project;
- The private non-profit partner carries out actions consistent with its own social goals.

With reference to Table 4, in the case of projects for the enhancement, in private–public partnership, of unused public buildings, it is possible to find substantially three cases:

- The private partner supports, entirely or partially the investment and project management costs (Band A,) in a context of profit activity;
- The private partner, profit or non-profit, exclusively assumes the management of a recovered and re-used property with public resources (Band B);
- The project is implemented and managed by public entities (Band C).

In the first two cases the economic evaluation of the project aims at verifying:

- In the first case, profitability, that is the ability over time to adequately remunerate the capital invested;
- In the second case, the managerial balance, i.e. the ability to guarantee the mere sustainability over time of the functions envisaged.

To clarify, by now, the term “feasibility” will be used when the need arises to verify the profitability of an investment; instead, the term “sustainability” will be used (referring to its economic dimension), when it will be necessary to verify the balance during the project management phase.

Table 4. Criteria for selecting the type of managing subject.

Type of Managing Subject	Sources of Financing	Criteria for Economic Feasibility and/or Sustainability Verification
Private for-profit (Band A.1)	Investments: Private Management: Private	Revenues must cover management costs and fully and adequately remunerate the capital invested
Private for-profit (Band A.2)	Investments: Private with public co-financing Management: Private	Revenues must cover operating costs and adequately remunerate the quote of equity capital
Private for-profit (Band B.1)	Investments: Public Management: Private for-profit	Revenues must cover operating costs with an adequate profit margin
Private not-for-profit (Band B.2)	Investments: Public Management: Private not-for-profit	Revenues must only cover operating costs
Private not-for-profit (Band B.3)	Investments: Public Management: Private not-for-profit with public co-financing	Revenues must cover a significant portion of management costs
Public (Band C)	Investments: Public Management: Public	The usability of the asset must also be guaranteed in case of limited or zero revenues

4.2. Profitability in the Hypotheses of Re-Use of Unused Public Buildings

Considering the asset capacity to generate revenue, six different conditions of profitability can be assumed [24]:

Band A

Band A.1 High profitability

Band A.2 Medium to high profitability

Band B

Band B.1 Average profitability

Band B.2 Lower-middle profitability

Band B.3 Low profitability

Band C

Band C.1 Insufficient or nothing profitability

The case of insufficient or zero profitability, implies the absence of the minimum conditions for any form of public-private partnership and entrusts the public bodies exclusively, as responsible for making a specific case of asset available. This assumption, however, is quite difficult to be, due essentially to the public sector progressive decline in the delivery of resources [25,26].

Each of the first five of profitability conditions can be associated with five different public-private partnerships procedures, with the related management models (Table 5).

Table 5. Distribution of investment and managing costs between public and private entities.

	Investment Costs	Managing Costs
<i>Band A</i>		
Band A.1 High profitability		
Band A.2 Medium to high profitability	1- μ	μ
<i>Band B</i>		
Band B.1 Average profitability		
Band B.2 Lower-middle profitability		
Band B.3 Low profitability		1- ϵ
<i>Band C</i>		
Band C Insufficient or not profitability		

Legenda: ■: Private for-profit; ■: Private not-for-profit, activities not-for-profit; ■: Public.

4.3. The Choice of the Evaluation Technique

For each of the profitability bands referred to in Table 5, different techniques for verifying the feasibility and economic sustainability of the projects respond to the different purposes of the assessment.

Band A (high and medium high profitability): In this case, the assessment of the economic feasibility aims at verifying whether the incoming cash flows generated over time by the project, in addition to fully covering the operating costs, also manage to adequately remunerate the risk-sharing of the invested capital. In this case, the financial analysis will be developed for a reasonable period of time, equal to the life cycle of the project; the technique to be used is the Discounted Cash Flow Analysis—DCFA or Discounted Cash Flow Analysis. If the project fails to generate such cash flows, remunerating the initial investment entirely, it is possible to reiterate the evaluation, hypothesizing alternative scenarios, characterized by different relationships between risk capital and public contribution, in order to identify the minimum threshold for the public contribution, for which the project is still economically feasible.

Band B (average, medium-low and low profitability): In this case, the evaluation aims to verify the mere economic sustainability referred to a time period equal to the life cycle of the project. Therefore, the incoming cash flows generated annually by the project must cover the relative management costs [27]. The most suitable valuation technique, in this case, is the Cash Flow Analysis—CFA or Cash Flow Analysis: It differs from DCFA for the time horizon, which, in this case, is equal to 1 and refers to a full year of the project; further differences concern some of the items that are taken into consideration by the two techniques, as will be seen better below. The technique uses a particular form of an income statement, referring to the specific project, whose result must be equal to or greater than zero. It can also be applied repeatedly to alternative scenarios, characterized by subjects of different nature (profit, non-profit) according to the scheme illustrated below.

Band C (Insufficient or no profitability): The evaluation must provide the public decision maker with features to understand the social utility of the project. Frequently, the most used technique is the Cost Benefit Analysis—CBA or Cost Benefit Analysis [28]: The evaluation verifies if the direct and indirect benefits, internal and external, deriving from the project, are higher than the related costs, and therefore, the community benefits from its implementation. One of this technique limits, particularly relevant in this historical phase lacking of public resources, is that, even if the utility of a project is demonstrated, the uncertainty about its economic feasibility: A compared analysis between alternative projects, for instance, could help understanding which of them has the best relationship between the reachable benefits and the costs to be incurred (efficiency measure) or which project could maximize the benefits (measure of effectiveness) [29]. This case can be considered beyond the public-private partnership ratio, and therefore, it will not be further investigated, referring to the copious scientific production on the subject for possible further investigations, including Florio et al., 2003; Pennisi and Scandizzo, 2003 [30,31].

Summary (Table 6):

- Range A (High and Medium High Profitability): Discounted Cash Flow Analysis—DCFA or Discounted Cash Flow Analysis; time horizon: Project life cycle;
- Range B (Average, medium-low and low profitability): Cash Flow Analysis—CFA or Cash Flow Analysis; time horizon: Full year of operation;
- Range C (Insufficient or no profitability): Cost Benefit Analysis—CBA or Cost Benefit Analysis; time horizon: Project life cycle.

Table 6. Aims and techniques of evaluation.

Aim	Technique
Verification of the profitability of an investment (feasibility)	Discounted Cash Flow Analysis—DCFA
Verification of the management balance of a project (economic sustainability)	Cash Flow Analysis—CFA
Verification of the public convenience of a project	Cost-Benefit Analysis—CBA

Whatever the question, the evaluation process is often repeated, in order to evaluate both alternative solutions and scenarios starting from a single solution. The technique to be used is chosen by the evaluator based on his experience, linked to the specific case.

5. The Financial Economic Plan of a Project

5.1. The Financial Economic Plan Structure

A fundamental tool to express a judgment of convenience regarding the feasibility/economic sustainability of a project to be carried out in public-private partnership is the economic financial plan (PEF), which includes the estimate of revenues, investments and management costs assumed by the private subject involved [32].

The PEF can be divided into 4 phases:

- Phase 1. Estimation of Investment Costs
- Phase 2. Estimation of Revenues
- Phase 3. Estimation of management costs
- Phase 4. Validation of economic feasibility and/or sustainability.

The last phase of the PEF, therefore, is the validation of the project feasibility and/or economic sustainability: This can be done by using one of the two kinds of the Cash Flow Analysis, for the full year if we refer to sustainability, or referring to the life cycle of the project to assess the economic feasibility.

Phase 1. Investment costs appraisal

The investment appraisal is divided into three parts, corresponding to different types of expenditure:

- Part I—recovery and re-functionalization of buildings investments;
- Part II—building practicability investments;
- Part III—communication and marketing investments.

The required investment to recover and possibly redefine the property can be estimated by drawing up an economic framework, in accordance with the provisions of art. 16 of the D.P.R. 5 October 2010, n. 207, Regulation for the execution and implementation of the Code of public contracts, and € equivalent to the estimate of Production Cost [33,34].

As already mentioned above, economic and financial plan prevailing approach draws the methodological bases from the disciplines dealing with the companies' economic dynamics.

However, if we take into consideration, for example, the authoritative guide published by the UVAL, number 30/2014 of its own series [Materials] [35], such approach leads to some uncertainty: It is enough to note, only to highlight an aspect between the many, how the costs for labor are treated in the estimate of the investment costs of table III.5, page 23 of the guide, shown below, in clear contrast to all the coded methods of calculating costs in the building process (Table 7).

Table 7. Investment costs according to UVAL.

5	Investment Costs	Euro
+	Civil works	6.000.000
+	Systems and equipment	3.000.000
+	Expropriations (<20% of eligible expenses)	1.000.000
+	Manpower	500.000
+	Design	100.000
+	Other (general expenses)	500.000
=	Sub-total initial investment	11.100.000
	Unforeseen events (percentage share 5–10%)	7%
+	Unforeseen events	777.000
+	Investment not eligible for public grant	100.000
+	Extraordinary maintenance during exercise	200.000
=	Total investment cost	12.177.000
	of which Eligible costs	11.877.000

Source: UVAL/DPS–IRPET application.

The cost of works evaluation, or construction cost, will take place through synthetic-comparative procedures, since it is developed within a preliminary phase of design choices definition, through the use of parametric, or mixed, appraisals for functional elements or significant samples.

It is also possible to identify the various items of the works, possibly subdivided by macro-category of works (consolidations, masonry works, installations, external arrangements, parking lots, etc.).

It is clear that, in this case, since these are public owned properties, the costs for their acquisition are zero. However, if the administration intends to use a property potentially important for the community, such as a building of historical value, but still privately owned, the acquisition-related costs should be assessed since the beginning, according to the provisions of the Consolidation Act on expropriations for public utility [36].

As regards the need to make the buildings usable, it will be required to estimate the furnishings and equipment, hardware and software costs, with the related value-added tax, if not recoverable by the investor. Similarly, depending on the function, the communication and marketing initial investments have to be estimated.

This phase ends with the formulation the investment capital composition, subdividing it into a share of the private investor's own capital, the share of debt capital and any share of public co-financing, in the form of capital grants.

Phase 2. Revenues appraisal

The revenue assessment phase is divided into sub-categories:

- Identification of goods to be produced or services to be provided;
- Estimation of their unit sales price;
- Identification of the target reference environment;
- Demand to be satisfied according to the referring target;
- Revenues appraisal.

Clearly, revenues generated by projects depends on the demand, which in turn depends on a series of factors [37], such as:

- The potential user pool (an asset located in a big city with strong tourist attendance, for example, has a higher potential pool than one located in a small town with a low visitors attendance);
- The asset planned use and the related functions it brings with;
- The existence of similar assets and/or functions in its proximity;
- The intrinsic attractiveness of the considered asset;
- The communication and marketing strategies effectiveness and the availability of resources to be allocated for these activities.

Phase 3. management costs appraisal

The management cost appraisal phase implies the management model definition, and manager identification. This makes it possible to identify the human resources essential for the project management analytically, and to assess the annual costs related. In addition to workers costs. Then, other management costs occur in the fully operational year, such as consumables, services, etc.

Particularly interesting is the cost items evaluation, in order to figure out the analysis to be carried out subsequently, whether annual (CFA) or multi-year (DCFA): As already said before in the two cases, cost items are treated differently, such as provisions for extraordinary maintenance and financial charges.

Phase 4. feasibility and/or economic sustainability check

The PEF last section consists of the cash flows analysis; as seen, this activity can be aimed at verifying:

- The feasibility of the investment, through the evaluation of its profitability, through the use of the Discounted Cash Flow Analysis—DCFA or Discounted Cash Flow Analysis;
- The project management sustainability, through the check of the budget balance in the fully operational year, through the Cash Flow Analysis.

5.2. The Cash Flow Analysis for the Projects Economic Evaluation

To be able to proceed with the project feasibility and/or economic sustainability evaluation, it is necessary to build a cash flow analysis structure that is simultaneously consistent with the purpose of the assessment and with the indications of national and international accounting principles, regarding financial reporting previously mentioned (OIC 10 and IAS 7). Below are two diagrams, one for the Cash-Flow Analysis—CFA, the other for the Discounted Cash-Flow Analysis—DCFA meeting these requirements.

5.2.1. Project Equilibrium Evaluation in the Management Phase: The Cash-Flow Analysis

Considering a project for the public buildings improvement, through a public-private partnership that provide the private assignment of the management phase, without any investments from them: To evaluate the project equilibrium, the cash flows (Cash Flow Analysis) in the full year is sufficient, and the result must be equal to or greater than zero (Table 8).

The difference between income and revenues, in the case of for-profit activities, provides the result before taxes, while in the case of non-profit activities, it provides a management surplus, to be used in following years for purposes consistent with the management entity purposes.

Table 8. Scheme of Cash Flow Analysis.

A) Inflows:	
1) revenue from sales and project performance	
2) other revenue and income (government grants for management, fundraising, membership fees, other private contributions, etc.)	
	Total A
B) Outflows:	
3) for raw materials, ancillary materials, consumables and goods	
4) for services (utilities; repairs; cleaning; other routine maintenance services)	
5) for the use of third-party assets	
6) for human resources:	
(a) wages and salaries; (b) social security contributions; (c) severance pay; (d) retirement and similar treatment; (e) other costs;	
7) for setting up a contingency fund	
8) other management charges	
9) Investments planned for replacement of tangible fixed assets (equipment and furnishings)	
10) Investments planned for replacement or renewal of intangible assets	
11) Establishment of a fund for extraordinary property maintenance	
	Total B
Difference between inflows and outflows (A–B)	
Result before taxes on the project's operating income (profit activities)	
Management surplus to be used for purposes consistent with the purposes of the managing entity (non-profit)	

5.2.2. Profitability Evaluation of a Project: The Discounted Cash-Flow Analysis—DCFA

In the case of projects for the enhancement of public buildings that provide the private entities involvement, with money investment, the DCFA is used. To this purpose, it is possible to hypothesize the following scheme for the Analysis of Discounted Cash Flow (Table 9):

Table 9. Scheme of Discounted Cash Flow Analysis.

	Years					TOT
	0 (Investim)	1	2	3 (Regime)	n	
A) Inflows:						
1) Revenues from sales						
2a) Other revenue and income: Investment: Public co-financing quota—capital contribution						
2b) Other revenue and income: The terminal value of the building						
Total A—Inflows						
B) Outflows:						
3) for raw materials, ancillary materials, consumables and goods						
4) for services (utilities; repairs; cleaning; other routine maintenance services)						
5) for the use of third-party assets						
6) for human resources: (a) wages and salaries; (b) social security contributions; (c) severance pay; (d) retirement and similar treatment; (e) other costs;						
7) for setting up a contingency fund						
8) other management charges						
9) Investments planned for replacement of tangible fixed assets (equipment and furnishings)						
10) Investments planned for replacement or renewal of intangible assets						
11) Investments planned for extraordinary property maintenance						
12) Initial investments (equity ratio)						
13) Financing activities: Mortgage interest and other financial charges						
Total B—Outflows						
C) Difference between inflows and outflows—Result before taxes on the project's operating-income (A–B)						
14) taxes on gross profits						
15) net profit (loss) of the project in the year						
15b) actualized net profit (loss) of the project in the year (NPV)						
						IRR

5.3. Cash Flows Detection Criteria

In order to use the diagrams shown above, some in-depth details are needed:

2) Other revenues and income

With respect revenues, the most important aspect concerns the investment residual value at the end of the project life cycle: This value must be considered in the case of application of the DCFA, by inserting it in the item (2) Other revenue and income, for the evaluation of the investment profitability and it might vary, in relation to the possible provision of extraordinary maintenance interventions, during the life cycle or not.

A further aspect to be considered for an investment profitability evaluation is the inclusion of other revenues and income, again in item (2), of any public co-financing quota: This item must be considered in those cases where revenues do not allow to fully recover the capital invested (Profitability class A.2).

The case of the project operational sustainability evaluation, under item (2): Other revenues and income can be added to any other public contributions for management reasons or from fundraising activities (membership fees, fundraising, other voluntary contributions private individuals, etc.).

4) Costs for services

Within this cost item, in particular, exits for utilities (electricity, gas, telephone, etc.) and exits for routine maintenance must be considered, starting first of all from cleaning costs.

There are different definitions of maintenance.

The definition of maintenance as it appears in the UNI EN 13306 [38] standard, for example, defines maintenance interventions as those characterized by the “combination of all technical, administrative and management actions, foreseen during the life cycle of an entity, intended to maintain it or bring it back to a state in which it can perform the required function”.

The most relevant distinction, according to the authors, to be stressed, is that between ordinary and extraordinary maintenance.

The D.P.R. 380/2001—Consolidated text for buildings [39], in art. 3, defines “ordinary maintenance interventions”, the building interventions that concern the works of repair, renovation and replacement of the finishes of the buildings and those necessary to integrate or maintain the existing technological systems.

From an economic point of view, ordinary maintenance has a recurring nature (for example cleaning, painting, repair, replacement of parts damaged by use) and it is carried out to keep tangible assets in good working order through interventions that aim to guarantee their life expected profit, as well as the original capacity and productivity; it also includes repairs, and can also be attributed to fixed assets.

According to the national accounting principles issued by the Italian Accounting Body—OIC, in particular, the principle OIC 16 [40], ordinary maintenance costs are those incurred by the company to preserve the efficiency of the asset. The asset to be improved, therefore, has to keep its useful life and the original productive capacity unchanged. This category includes the costs incurred to repair faults, for the replacement of consumables, painting, cleaning, etc. The purchase of consumables, therefore, unlike the others, must be attributed to item 3).

6) Workers costs

As specified in the first part, the manager can also affect the costs of human resources.

In some cases, indeed, the activities planned do not produce sufficient income to cover all management costs, including those for human resources involved.

In such cases, a community, considering the value of those initiatives for the entire society involved, may decide to take charge of their performance anyway, through not-for-profit organizations, carrying out no-profit activities. Acting like this, there will be significant cost reductions, even if some member might still be paid, if the conditions are met.

9), 10) Planned investments for the replacement of tangible and intangible fixed assets

A balance of economic activity is guaranteed over time if it generates incomes to restore the capital assets value over time, even for the purpose of replacing them [41].

It is, therefore, advisable to consider a periodic investment intended to replace the furnishings, equipment and intangible assets; together with the establishment of a fund for the extraordinary maintenance of the buildings, point 11), that becomes crucial to maintain the usability purpose of the building and its services over time.

11) Scheduled investments or establishment of a fund for the buildings extraordinary maintenance

In order to guarantee the sustainability of the activities over time, in the case of the management balance assessment through the cash flows analysis, considering the year of operation, a fund that allows periodic interventions of extraordinary maintenance must be established in advance f.

On the contrary, in the case of an investment profitability evaluation through the DCFA application, the prevision of sums for extraordinary maintenance interventions is discretionary and depends on the time range taken into consideration: Considering a life cycle of 10 years, for example, such sums may not be envisaged; conversely, if they are considered, they will positively affect the residual asset value at the end of the measured life cycle.

From an economic point of view, extraordinary maintenance costs are expenditures for the growth, upgrading or improvement of the structural asset elements, translating into a significant and measurable increase:

1. Capacity;
2. Productivity;
3. Security;
4. Useful life;
5. Asset compliance with the expected purposes [42].

The above-mentioned art. Three of the Consolidated Law on Building, on the other hand, defines as “extraordinary maintenance interventions”, the works and the modifications necessary to renew and replace even structural parts of buildings, as well as to create and integrate hygienic-sanitary and technological services, maintaining volumes and surfaces of the single real estate unit and not involving changes of use.

12) Initial investments (equity ratio)

For the investment profitability evaluation through the DCFA, it is necessary to add the share of private capital, belonging to the initial investment, among the outgoing cash flows, considering the time of implementation. This amount also includes any capital obtained from the private entity through the use of credit (mortgages etc.).

In this way, it will be possible to verify the actual trend of the cash flows and to estimate even more correctly any financial charges.

If the difference between all the discounted incoming and outgoing cash flows is positive or not, it will be possible to check if the revenues produced by the project will cover all the outflows and if they will allow the initially invested risk capital recovery, remunerating it adequately.

13) Interest and other financial charges;

This output item can be considered optional. Indeed, according to some authors, any financial charges fall within the subjective convenience judgment that the private entity expresses when decides to enter a partnership agreement with a public body.

This study, however, looks at the public decision-maker perspective, who must decide whether, and under what conditions, to entrust private subjects to build and manage a development project: Thus, the assessment has to consider any payable interest, which may be one of the variables within

alternative forecast scenarios, aimed at verifying the conditions of convenience in the long run, considering different compositions of the capital investment.

Of course, interests on debt capital must be calculated to check the investment profitability. Nevertheless, this item is difficult to quantify, since it depends on variables external to the project (company financial capacity, cost of money, etc.); hence, an ordinary assessment has to be delivered, considering the specific space-time conditions in which the project will be carried out.

As a first step, the composition of the capital should be identified for initial investments, distinguishing it between the capital owned by investors and the debt capital, which will cause the interest expense charges.

On the other hand, no financial burdens must be borne by the private partner in the case of the mere management balance check.

14) Income taxes for the year;

In the case of profitability investment evaluation, the taxes on the gross profits generated by the project must also be considered; the net profits, once the taxes have been paid, represent the remuneration of the invested capital and the corresponding risks, i.e. the investment profitability.

Moreover, in this case, the appraisal of taxes implies significant margins of uncertainty, since the real amount paid depends on the other variables of the company's balance sheet, and as before, an ordinary assessment is mandatory considering all the other variable as nil, therefore, as if the company paid taxes exclusively for the gross profit deriving from the project.

Part Third—An Experimental Model of “Project of Economic Feasibility for the Enhancement of Unused Public Buildings in the Strategic Planning and the Integrated Projects”

6. The SOSTEC Model

The Laboratory LaborEst and the spin-off Urban Lab, both active at the Mediterranean University of Reggio Calabria, have developed an experimental model of “economic feasibility project for the development of unused public buildings” called SOSTEC; this model can be used when the public decision maker intends to verify whether the economic conditions exist for the use of private–public partnership agreements to implement and/or to manage a project.

The model is aimed at verifying the feasibility/economic sustainability of reuse hypotheses of unused public buildings, which is consistent with, and derived from, an overall idea of territorial development. The model, which can also be used in the case of buildings with a certain cultural value, is divided into three sections (Table 10):

- Section A—cognitive surveys
- Section B—reuse hypothesis
- Section C—financial economic plan.

The model structure allows to derive the reuse hypotheses from the knowledge of the territory dynamics and to verify the feasibility/sustainability of the formulated hypotheses.

Indeed, the model internalizes not only the usual socio-economic surveys (demographic trend, labor market, infrastructure and mobility system, cultural and environmental heritage, etc.), but also the stakeholders' point of view and this information, which derives from the programs in progress or already finished.

Particularly, as far as the programming is concerned, the references are assumed for the strategy and the objectives already identified by the local community, to develop coherent hypotheses, and the other programmed actions, with which eventually operate in synergy [43]. This cognitive framework should not be taken as a constraint, but as an element of awareness: The re-use of the specific building can also follow a different direction compared to the framework of the interventions already planned with other tools, but a similar choice should be motivated and conscious [44,45].

From the design point of view, (Section B—reuse hypothesis) choices to implement the model are synthetic: It is sufficient a functional program, equipped with the physical quantities of spaces intended for the different functions: These hypotheses allow to verify, at first glance, the coherence between the intrinsic characteristics of the building and the hypotheses of reuse formulated.

From the economic point of view (Section C—financial economic plan), the model provides for the preliminary evaluation of investment costs (Works for the recovery and re-functionalization of buildings; Furniture, hardware and software equipment for the usability of buildings; communication and marketing; etc.) followed by the economic dynamics analysis of the management phase. These dynamics are influenced, among others, by the type of manager entrusted to manage the asset, that can be a profit or not-for-profit subject: This hypothesis also determines economic implications, as explained later in the article.

The main purpose of the model, as mentioned, is the verification of the economic feasibility/sustainability of public-private partnership hypotheses: It serves, in other words, to verify the existence of sufficient conditions of convenience for private subjects, in the project realization and/or management in compliance with the expected public objectives, from which the work itself originates.

The term “feasibility”, used in this article, applies to verify the profitability of an investment; instead, the term “sustainability” is used (making exclusive reference to its economic dimension), with the attempt to verify the balance during the management phase of a project.

The financial economic plan, therefore, will have the purpose of verifying the feasibility/sustainability of the reuse hypotheses and, consequently, identifying the economic conditions that can be placed at the basis of the partnership agreement.

Table 10. Structure of the SOSTEC Model.

SECTION A	➔	COGNITIVE SURVEYS	➔	<ul style="list-style-type: none"> A.1 Territorial framework A.2 The territorial context A.3 Census of tangible and intangible cultural heritage A.4 The infrastructure and mobility system A.5 Existing programming A.6 Description of the asset to be enhanced A.7 Recognition of already completed projects A.8 Stakeholders’ point of view A.9 Best Practices Identification A.10 Problems and vocations identification
SECTION B	➔	REUSE HYPOTHESIS	➔	<ul style="list-style-type: none"> B.1 Idea-force of the project B.2 Objectives of the project B.3 Intervention hypothesis B.4 Functional schemes and substance
SECTION C	➔	FINANCIAL ECONOMIC PLAN	➔	<ul style="list-style-type: none"> C.1 Estimation of investment costs C.2 Estimation of revenues C.3 Estimation of management costs C.4 Verification of economic feasibility and/or sustainability of the project

6.1. Section A—Cognitive Surveys

The first section is divided into a series of sub-sections:

A.1 Territorial framework

The territory of the Municipality to which the cognitive investigation refers is described highlighting its position on a provincial and regional scale, associated with the description of graphic representations on appropriate cartography.

A.2 The territorial context

Economic and social aspects, productive fabric, etc. of the territory considered are analyzed. Specifically, data relating to population, employment (main sectors), agriculture and local production, number of companies by category, accommodation services, places of culture, non-profit associations, tourist flows (attendances and arrivals) are reported.

A.3 Census of tangible and intangible cultural heritage

In this section, material and immaterial cultural heritage of the Municipality considered are listed and mapped. Specifically, the following are identified: Material heritage archaeological areas, defensive architecture, religious architecture, noble palaces, historical centers, rural architecture, national and regional parks, S.I.C. (Sites of Community Importance), Z.P.S. (Special Protection Areas), geo-sites. Intangible heritage: Oral traditions, particular languages, social and ritual practices, artisan skills and the spaces associated with them, peculiar productions (including food and wine) part of that specific cultural identity.

A.4 The infrastructure and mobility system

This sub-section is devoted to the infrastructural and mobility systems, identifying, also on maps, the main hubs: Airports; railroad; ports; network of roads; mobility by public transport.

A.5 Existing programming

Through this sub-section it is possible to carry out a survey of existing or recently concluded programs, to develop strategies already in the territory, the needs, the objectives and any solutions already identified previously.

In the following phases it will be possible to select project coherent with this framework, but also to decide to change the priorities, the needs, the objectives and the solutions, in consistency with the analysis conducted.

A.6 Description of the asset to be enhanced

At this point, the cognitive investigation focuses attention on the asset to be valued, starting from a brief description. Then, the main identification data are reported: Name; type of asset; year of construction; the presence of constraints; public or private property; location; photos; level of decay; usability; reachability by public transport; availability of information (in the case of cultural heritage).

A.7 Recognition of already completed projects

In this sub-section there is a recognition of the projects already carried out on the asset considered for the redevelopment initiative, but also the general program to which the enhancement project must be coherent and, hopefully, helpful to achieve its objectives.

A.8 The stakeholders' point of view

Every investment has an impact beyond the finalized goods or services produced. Therefore, stakeholders have a specific role, and also interests, in the project implementation, helping future scenarios. The model foresees interviews with institutional stakeholders, such as local administrators, but also entrepreneurs, professionals, municipal technicians, associations. Interviews are useful to analyze perceptions and expectations from all categories of stakeholders involved. Following some examples:

- What are the main problems of the territory?
- What are the territory strengths and resources? Which hypothesis of reuse of the building can be strategically functional to improve its value? Why?

- What are the weak points, the critical points, the limits within the urban and rural territory that can hinder the development, and the hypothesis of re-use of the building? How can they be overcome?
- Can there be private profit or non-profit entities interested in building enhancement? If yes, which ones?

A.9 Identification of Best Practices

Once the cultural object of the simulation has been chosen, it can be useful to identify and describe a best practice, or an experience of success comparable to similar assets, in order to highlight those positive elements that allowed to obtain the best result, with respect to the contexts and the set objectives, taking into account previous cases of enhancement projects and projects to improve accessibility. It can also be useful to analyze management models and kinds of PPPs.

The best practices analysis not always provide the expected results: Solutions and models are often designed for completely different contexts and situations, not always useful for specific projects. In any case, the knowledge of how similar cases could provide some useful indications, as long as there is awareness of the limits of this methodology.

A.10 Identification of problems and vocations

The cognitive analysis conducted allows the identification of main issues, but also the territory vocation and the assets to be enhanced.

6.2. Section B—Reuse Hypothesis

B.1 Project strong-point

In this first sub-section the idea that the project intends to pursue according to the resources of the territory, the economic fabric, etc., must be briefly described.

B.2 Project objectives

In detail, a strong idea of the project should be explained, describing the specific objectives, specifying which needs the project intends to satisfy through the asset development project.

B.3 Intervention hypothesis

Considering the cognitive investigations carried out, and the outcomes analyzed the first hypothesis of intervention can be drawn, referring to those activities to be localized, and the subjects to be involved (profit and not-for-profit, private individuals, institutions, etc.).

B.4 Functional schemes and consistency

The meta-design idea drawn by the intervention hypothesis must be graphically depicted through plan diagrams, on adequate scales, describing the functions to be added, by attaching a legend to match the assigned surfaces with the given functions.

6.3. Section C—Financial Economic Plan (FEP)

As already explained above, the FEP is divided into 4 phases:

Phase C.1. Investment costs assessment (Works for the recovery and re-functionalization of buildings; Hardware and software furniture and equipment for the usability of buildings; communication and marketing; etc.).

Phase C.2. Revenues assessment (Identification of goods to be produced or services to be provided; estimate of their unitary sale price; identification of the target audience; demand assessment revenues assessment).

Phase C.3. management costs assessment (management model and manager description; human resources plan, management costs appraisal, such as consumables, services, workers, etc.).

Phase C.4. Project economic feasibility and/or sustainability.

6.3.1. Phase C.1. Investment Costs Assessment

Preliminarily, it is necessary to identify all the investment items, possibly subdivided by macro-category of works (masonry, consolidation, parking, etc.) and by type (furnishings, equipment, software, technical expenses). The estimate will be made through the synthetic procedures for the estimation of the construction/production cost, as concern the building works, and the equipment and furnishings too, that will have to be carried out according to the building re-use hypothesis, with respect the different rooms it is composed by.

Then, the capital composition has to be analyzed, establish public and private investment shares; as concern the private share, it the equity the debt share has to be established, to calculate a possible annual loan installment, to be added to the Discounted cash flow analysis.

At the end of this phase, it is necessary to hypothesize the residual value of the building at the end of the life cycle, that will be added among the revenues, in the case of the profit management entity, jointly to the public investment shares.

6.3.2. Phase C.2. Revenues Assessment

After the investment costs assessment, the private subject has to be established, if profit or not-for-profit entity of management, to proceed with the subsequent f costs and revenues assessments.

The revenues appraisal requires, first of all, the identification of goods to be produced, or the services to be provided, and the estimate of their unity sale price.

Then, it is possible to figure out the demand, through the definition of the reference target of the proposed project.

Among the revenues, in the case of no-profit management entity, membership fees have to be considered; other private contributions and fundraising; any government grants for management.

6.3.3. Phase C.3. Management Costs Assessment

To assess management costs, the management model has to be established in advance. In order to identify the optimum management model for the proposed project, its sustainability has to be verified, both with a private for-profit entity and a not-for-profit one, also specifying the additional subjects eventually involved in the management phase. The management model is based on the use of an organization chart to list the activities, the foreseen functions and the role assigned to each human resource involved, specifying the taken legal form (consortium, partnership agreement, etc.)

Consistently with the management model, the different items of management costs (consumables, services, maintenance etc.) are evaluated, identified through synthetic procedures and surveys, clarifying the reference sources (national labor contracts, best practices, etc.).

6.3.4. Phase C.4. Project Economic Feasibility and/or Sustainability

Basing on the revenues and costs assessments, the economic sustainability of the intervention can be verified in the management phase (non-profit subject), or the investment feasibility in terms of profitability (profit subject) by alternatively drawing up one of the two economic accounts exposed before (Scheme of Cash Flow Analysis and Scheme of Discounted Cash Flow Analysis).

7. Conclusions

The SOSTEC model was conceived as a tool. Even though it was still experimental in character, it was intended for public administrations needs to re-develop unused real estate, not for residential use, with the involvement of private entities.

The model, can be helpful for existing buildings enhancement, also of historical and architectural value, and suitable for development projects of areas susceptible to transformation, and allows to:

- Identify destinations of use that meet the needs of the territory, local development policies and the intrinsic characteristics of the asset to be enhanced;
- Identify the possible ways of private subjects involvement: If there are those real conditions, such as sufficient profitability, for their involvement in the investment or rather providing support for the management phase;
- Determine the economic conditions base of the partnership: Discerning the need for, public participation, by co-financing or by managing the investment or if, instead, the revenues generated by the project are sufficient to guarantee its feasibility, (with private investments), or its sustainability, (with private management).

The identification of the type of private entity involvement, through the SOSTEC model, takes place by reiterating the evaluation, in order to identify feasible and/or sustainable solutions and to exclude those that do not possess these requirements.

One of the SOSTEC model objectives is also the homogenization of those items included within the different cash flow analysis methods: In detail, the article aimed at highlighting the main differences introduced by the cash flow analysis scheme, updated or not, focused to assess the urban projects feasibility and sustainability, in compliance with the company accounting, such as the Balance Sheet.

Therefore, the model will be conveniently tested through the case studies application.

Moreover, by these tests, it is expected:

- To verify the model completeness as concern the fact-finding phase;
- To understand the different item effects on the final results, in input and output, introduced by the cash flow analysis, discounted and not discounted, usually different from those within the Balance Sheet.

The research activity will also continue toward the integration of monetary techniques, used in the model described above, with qualitative criteria that improve the capacity of the hypothesized solutions in order to respond to the citizens' real needs and the territories socio-economic dynamics.

Author Contributions: 1. Introduction, 3. Monetary evaluations of projects in the PPP, and 7. Conclusions, L.D.S.; 2. The cooperation between public and private subjects, 4. Evaluation techniques and project profitability, and 5. The Financial Economic Plan of a project, F.C.; 6. The SOSTEC model, F.C. and L.D.S.

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References

1. Donolo, C. Dalle politiche pubbliche alle pratiche sociali nella produzione di beni pubblici? Osservazioni su una nuova generazione di policies. *Stato Mercato* **2005**, *25*, 33–66.
2. Calabrò, F.; Della Spina, L. Il Partenariato Pubblico Privato per la valorizzazione degli immobili pubblici inutilizzati. *LaborEst* **2018**, *16 IS*, 3–4.
3. Decreto Legislativo 18 Aprile 2016, n. 50 e s.m.i., Codice dei Contratti di Appalto e di Concessione Delle Amministrazioni Aggiudicatrici e Degli enti Aggiudicatori Aveni ad Oggetto L'acquisizione di Servizi, Forniture, Lavori e Opere, Nonchè i Concorsi Pubblici di Progettazione. 2016.
4. Merola, G.D. *Autonomia Locale e Governo Imperiale: Fiscalità e Amministrazione Nelle Province Asiatiche*; Edipuglia: Bari, Italy, 2001.
5. Studio—Linee Guida "Strategie e strumenti per la valorizzazione del patrimonio immobiliare pubblico" a cura di "Studiare Sviluppo", società in house del Ministero dell'Economia e Finanze, per conto del Dipartimento per gli Affari regionali, le Autonome e lo Sport (DARAS) della Presidenza del Consiglio dei Ministri. 2016.
6. Bilancia, P. (Ed.) *La Valorizzazione dei Beni Culturali. Modelli Giuridici di Gestione Integrata*; FrancoAngeli: Milano, Italy, 2006; Volume 642.
7. Propersi, A. *Il Sistema di Rendicontazione Negli Enti non Profit. Dal Bilancio D'esercizio al Bilancio di Missione*; Vita e Pensiero: Milano, Italy, 2004.

8. Francesconi, A. *Comunicare il Valore Dell'azienda non Profit*; Wolters Kluwer: Milano, Italia, 2007.
9. Fiorentini, G.; Preite, D. *Azienda Pubblica e Azienda non Profit: Il Ruolo del Bilancio Sociale Nel Decentramento*; Azienda pubblica: Parma, Italy, 2000.
10. Fazzi, L.; Giorgetti, G. *Il Bilancio Sociale Per le Organizzazioni non Profit: Teoria e Pratica*; Guerini e Associati: Milano, Italy, 2005.
11. Pelfrey, S. Cost categories, behavior patterns, and break-even analysis. *J. Nurs. Adm.* **1990**, *20*, 10–14. [[CrossRef](#)] [[PubMed](#)]
12. Carbonara, S.; Cerasa, D.; Sclocco, T.; Spacone, E. A preliminary estimate of the rebuilding costs for the towns of the Abruzzo Region affected by the April 2009 earthquake: An alternate approach to current legislative procedures. In *International Conference on Computational Science and Its Applications*; Springer: Cham, Switzerland, 2015; pp. 269–283. [[CrossRef](#)]
13. Scrivo, R.; Rugolo, A. Sostenibilità e fattibilità nella programmazione delle opera pubbliche. Metodologie e strumenti per un centro regionale di controllo dei costi negli appalti pubblici. *LaborEst* **2016**. [[CrossRef](#)]
14. Baraldi, S.; Cifalinò, A.; Sacco, P. *I Sistemi di Programmazione e Controllo*; Giappicheddi: Torino, Italy, 2011; pp. 15–29.
15. Codice Civile italiano, Artt. 2423–2427.
16. Del Pozzo, A. *Controllo Finanziario e Rischio di Default*; FrancoAngeli: Milano, Italy, 2011.
17. Organismo Italiano di Contabilità—OIC. *Principio Contabile OIC 10*; OIC: Rome, Italy.
18. International Accounting Standards IAS 7.
19. Realfonzo, A. *Teoria e Metodo Dell'estimo Urbano*; Nuova Italia Scientifica: Rome, Italy, 1994.
20. Prizzon, F. *Gli Investimenti Immobiliari*; Celid: Torino, Italy, 1995.
21. *Conferenza Delle Regioni e Delle Province Autonome, Linee Guida per la Redazione di Studi di Fattibilità*; ITACA: Rome, Italy, 2013.
22. Morano, P.; Tajani, F. The Break-Even Analysis applied to urban renewal investments: A model to evaluate the share of social housing financially sustainable for private investors. *Habitat Int.* **2017**, *59*, 10–20. [[CrossRef](#)]
23. Roscelli, R. *Manuale di Estimo*; UTET Università: Novara, Italy, 2014.
24. Tramontana, C.; Calabrò, F.; Cassalia, G.; Rizzuto, M.C. Economic sustainability in the management of archaeological areas: The case of Bova Marina (Reggio Calabria, Italy). In *New Metropolitan Perspectives*; Calabrò, F., Della Spina, L., Bevilacqua, C., Eds.; Springer: Cham, Switzerland, 2019; Volume 101, pp. 288–297. [[CrossRef](#)]
25. Aas, C.; Ladkin, A.; Fletcher, J. Stakeholder collaboration and heritage management. *Ann. Tour. Res.* **2005**, *32*, 28–48. [[CrossRef](#)]
26. Franch, M. Le frontiere manageriali per la valorizzazione della cultura e dell'arte. *Sinergie Ital. J. Manag.* **2010**, *82*, 95–107.
27. Kaplan, R.S.; Atkinson, A.A.; Morris, D.J. *Advanced Management Accounting*; Prentice Hall: Upper Saddle River, NJ, USA, 1998; Volume 3.
28. Mollica, E. *Principi e Metodi di Valutazione Economica dei Progetti di Recupero*; Rubbettino: Soveria Mannelli, Italy, 1995.
29. Nesticò, A.; Macchiaroli, M.; Pipolo, O. Costs and benefits in the recovery of historic buildings: The application of an economic model. *Sustainability* **2015**, *7*, 14661–14676. [[CrossRef](#)]
30. Florio, M.; Finzi, U.; Genco, M.; Levarlet, F.; Maffii, S.; Tracogna, A.; Vignetti, S. *Guida All'analisi Costi-Benefici dei Progetti di Investimento*; Fondi Strutturali, Fondo di Coesione e ISPA: Roma, Italy, 2003.
31. Pennisi, G.; Scandizzo, P. *Valutare L'incertezza: L'analisi Costi-Benefici nel 21. Secolo*; Giappichelli: Torino, Italy, 2003.
32. CIPE—Unità Tecnica Finanza di Progetto. *La Valutazione Della Convenienza Economico-Finanziaria Nella Realizzazione e Gestione Degli Investimenti Pubblici con il Ricorso Alla Finanza Privata*. 2002.
33. Decreto del Presidente Della Repubblica del 5 Ottobre 2010, n. 207, Regolamento di Esecuzione ed Attuazione del Decreto Legislativo 12 Aprile 2006, n. 163, Recante Codice dei Contratti Pubblici Relativi a Lavori, Servizi e Forniture in Attuazione Delle Direttive 2004/17/CE e 2004/18/CE. 2010.
34. Calabrò, F.; Della Spina, L. Processo edilizio e stima dei costi. *LaborEst* **2015**. [[CrossRef](#)]
35. Gori, G.; Lattarulo, P.; Maiolo, S.; Petrina, F.; Rosignoli, S.; Rubino, P. Lo studio di fattibilità nei progetti locali realizzati in forma partenariale: Una guida e uno strumento. *Mater. UVAL* **2014**, *30*, 47–62.
36. Decreto del Presidente Della Repubblica dell'8 Giugno 2001, n. 327, Testo Unico Sulle Espropriazioni per Pubblica Utilità. 2001.

37. Cochrane, J.; Tapper, R. Tourism's contribution to world heritage site management. In *Managing World Heritage Sites*; Routledge: Abingdon-on-Thames, UK, 2006; pp. 97–109.
38. Norma UNI EN 13306. Manutenzione—Terminologia di manutenzione.
39. Decreto del Presidente Della Repubblica del 6 Giugno 2001, n. 380—Testo Unico Edilizia, Art. 3. 2001.
40. Principio OIC 16.
41. Ziani, L. Voce: "Ammortamento", *Dizionario di Economia e Finanza*; Treccani: Roma, Italy, 2012.
42. Cherubini, D. Le Spese di Manutenzione—Trattamento Civilistico e Fiscale. 2007. Available online: <http://www.blustring.it>.
43. Della Spina, L.; Calabrò, F. Decision Support Model for Conservation, Reuse and Valorization of the Historic Cultural Heritage. In *Computational Science and Its Applications—ICCSA 2018*; ICCSA 2018. Lecture Notes in Computer Science; Gervasi, O., Ed.; Springer: Cham, Switzerland, 2018; Volume 10962. [CrossRef]
44. Giuffrida, S.; Napoli, G.; Trovato, M.R. Industrial Areas and the City. Equalization and Compensation in a Value-Oriented Allocation Pattern. In *International Conference on Computational Science and Its Applications*; Springer International Publishing: Berlin, Germany, 2016; pp. 79–94.
45. Guarini, M.R. Self-renovation in Rome: Ex ante, in itinere and ex post evaluation. In *Computational Science and Its Applications—ICCSA 2016*; ICCSA 2016. Lecture Notes in Computer Science; Gervasi, O., Ed.; Springer: Cham, Switzerland, 2016; Volume 9789, pp. 204–218. [CrossRef]



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