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ECONOMIC VALUATION OF URBAN HERITAGE  
MODELLING AN INTEGRATIVE FRAMEWORK BASED ON SUSTAINABILITY PRINCIPLES  
SCIENTIFIC SUBJECT REVIEW  
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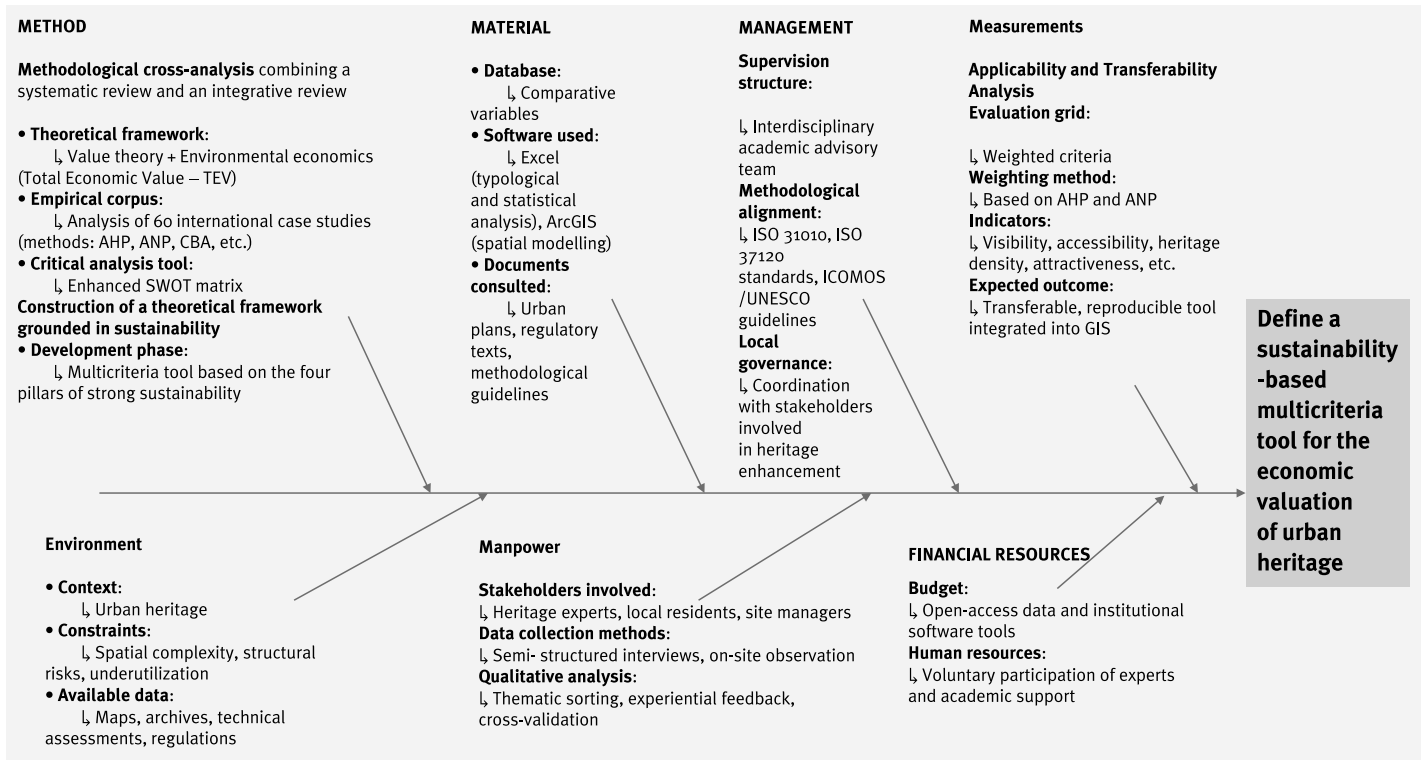


FIG. 1 METHODOLOGICAL FRAMEWORK DIAGRAM (BASED ON THE ISHIKAWA 7M MODEL)



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## ECONOMIC VALUATION OF URBAN HERITAGE MODELLING AN INTEGRATIVE FRAMEWORK BASED ON SUSTAINABILITY PRINCIPLES

ECONOMIC VALUATION  
INTEGRATED MANAGEMENT  
MULTICRITERIA METHODOLOGY  
SUSTAINABILITY  
URBAN HERITAGE

In response to the increasing complexity of urban heritage management, this study proposes an analytical framework that integrates sustainability theory with multicriteria approaches to economic valuation. A systematic and integrative literature review was conducted, drawing on over sixty documented international case studies. These cases reveal dominant methodological trends, their application contexts, and the strengths and limitations of the valuation tools employed. The critical analysis distinguishes classical monetary approaches from more systemic methods that incorporate social, cultural, and environmental

dimensions. The need to move beyond purely economic logics by integrating strong sustainability criteria and often overlooked qualitative indicators is highlighted in the study. Based on this diagnosis, a multicriteria economic valuation method rooted in sustainability is identified as the most appropriate. The research culminates in the development of an analytical grid encompassing both tangible and intangible factors, aimed at supporting informed decision-making in the valorization and planning of urban heritage. The proposed method is characterized by its adaptability to complex heritage urban contexts.

## INTRODUCTION

**H**istoric urban centers constitute complex socio-spatial systems whereby architectural, cultural, and economic dimensions converge. Their long-term preservation presents critical issues of governance, particularly regarding the strategic allocation of limited public resources in rapidly evolving urban environments. In this context, economic valuation has gained traction as a key instrument to assess the multifaceted benefits, both tangible and intangible, associated with the safeguarding of historical assets (Licciardi, Amirtahmasebi, 2012; World Bank, 2012a). Beyond conventional indicators such as tourism revenue or land value appreciation, historic city cores are increasingly recognized for their diffuse yet substantial contributions to territorial cohesion, symbolic continuity, and spatial attractiveness (World Bank, 2012b; Kyte, 2012).

Nevertheless, conventional valuation practices often struggle to capture these multidimensional values. Due to its hybrid nature, urban heritage encompasses intertwined economic, cultural, social, and symbolic dimensions (UVSQ, 2012a). Traditional cost-benefit analysis tools frequently prove inadequate for addressing the complexity and non-market positive externalities inherent to heritage systems (Rypkema, Cheong, 2011). This limitation has fostered the emergence of more integrative approaches drawing upon environmental economics and multicriteria decision-making methods (Dalmás et al., 2014).

Among these, the Total Economic Value (TEV) framework (originally developed for ecological assets) has progressively been adapted to cultural heritage. By differentiating direct use values, indirect externalities, and non-use values such as existence or bequest, TEV provides a more comprehensive architecture for economic assessment (Dalmás et al., 2014). However, its operationalization remains fraught with challenges: the monetization of intangible goods, the reliability of stated preference methods, and ethical questions concerning the commodification of heritage all complicate implementation (Pujol-Galindo, 2024).

In response, international institutions have increasingly advocated for the integration of cultural dimensions into sustainable urban development models. The World Bank, for instance, has documented several cases in which heritage rehabilitation contributed to inclusive local growth by combining preservation, economic vitality, and quality of life (World Bank, 2012c). This recognition has encouraged the development of novel evaluation methods blending monetary and non-monetary indicators (UVSQ, 2012b; Dalmás et al., 2014).

The present study aligns with this perspective. It proposes an analytical framework grounded in a multicriteria reading of heritage value, drawing on sustainability indicators and principles from environmental economics (Fig. 2). Particular emphasis is placed on the distinction between heritage capital as stock and heritage services as flows, alongside the concept of strong sustainability, whereby certain cultural assets are considered non-substitutable (Dalmás et al., 2014). The overarching objective is to move beyond strictly monetarist approaches by offering public decision-makers a context-sensitive evaluation tool tailored to the complexity of urban heritage systems.

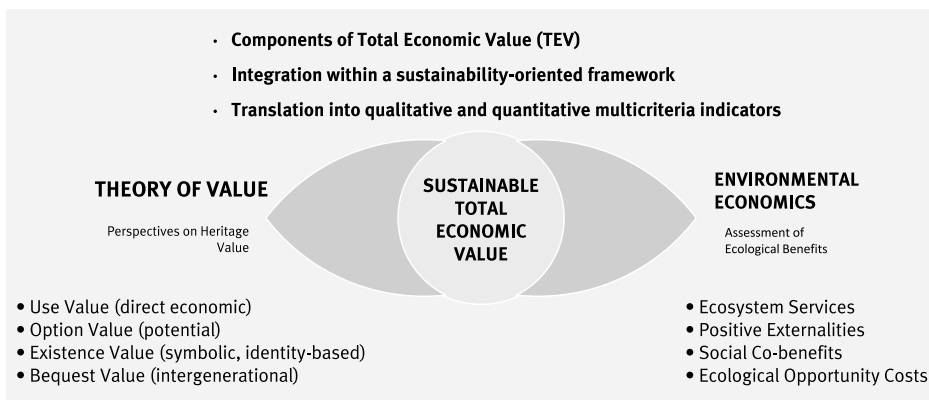
## METHODOLOGY

The methodology adopted in this research follows a rigorous four-step process, building on a theoretical framework rooted in the convergence of Total Economic Value (TEV) theory and environmental economics (Throsby, 2012; Dalmás et al., 2014; World Bank, 2012a). The main objective is to develop a multicriteria tool for the economic valuation of urban heritage, particularly suited to complex contexts such as historic city centers. The methodological framework highlights the paradox of a normative yet fragmented corpus: while dominant approaches demonstrate operational effectiveness, they often fail to integrate the crosscutting imperatives of strong sustainability (Soini, Dessein, 2016).

The emergence of critical approaches that combine qualitative assessment with integrated indicators opens new perspectives for redefining heritage value beyond strictly economic metrics. The methodology, combining value theory, environmental economics, a critical review of existing valuation methods, and the design of a multicriteria grid based on strong sustainability principles, constitutes a robust and multidimensional analytical framework (Fig. 1).

• **Theoretical convergence:** Value theory and environmental economics – The first phase consisted of building a hybrid conceptual framework by merging insights from value theory as applied to heritage (including use values, non-use values, existence and bequest values) with non-market valuation tools from environmental economics (contingent valuation, avoided cost methods, hedonic pricing, etc.). This theoretical convergence allows for a more comprehensive understanding of urban heritage value, extending beyond market-based assessments (Fig. 2).

• **Construction of an empirical corpus** of 60 documented cases – A structured corpus of 60 international case studies was compiled (Table I), covering rehabilitation or enhancement initiatives in historic urban areas, documented both methodologically and contextually. This database was used as the empirical foundation for identifying dominant configurations in economic heritage valuation. Each case was analysed using a matrix of criteria that synthesized the nature of the method applied (monetary, multicriteria, hybrid), the tools mobilized (surveys, modeling, GIS, etc.), the dimensions emphasized (economic, social, cultural, environmental), and the observed effects (territorial attractiveness, social inclusion, identity reinforcement). Through cross-tabulation in Excel, comparative typologies were extracted, enabling the identification of recurring methodological trends. These findings informed the critical stance adopted in the study and guided the construction of a valuation model tailored to the requirements of both urban heritage and sustainability. Data from the 60 international case studies were processed in Excel to classify variables, perform descriptive statistics, and construct comparative matrices. ArcGIS supported the spatial mapping and validation of analytical criteria, reinforcing the empirical consistency of the multicriteria framework. Furthermore, the selected criteria were weighted through the Analytic Hierarchy Process (AHP). This systematic approach allowed for the prioritization of evaluation dimensions and led to the formulation of a coherent and concise set of sustainability indicators within the analytical grid.



• **Critical review** of existing methodologies – A critical evaluation of the approaches identified was conducted using a tailored SWOT analysis, enabling the identification of strengths, weaknesses, opportunities, and limitations across major methodological families:

- Purely monetary approaches provide direct measurement but tend to reduce heritage complexity to financial flows.
- Participatory approaches enrich decision-making but often lack standardization.
- Multicriteria approaches capture qualitative dimensions, but their robustness depends on the weighting of indicators.

The choice of the SWOT framework (Table II-V) lies in its ability to synthesize internal and external factors and to support a comparative analysis. In this study, SWOT (Strengths, Weaknesses, Opportunities, and Threats) served as a strategic decision-making tool for assessing the relative merits and limitations of various heritage valuation methods. Although originally derived from strategic management (Wehrich, 1982), SWOT analysis

FIG. 2 CROSS-CONCEPT MAP: THEORETICAL INTERSECTION BETWEEN VALUE THEORY AND ENVIRONMENTAL ECONOMICS

TABLE I DISTRIBUTION OF CASE STUDIES BY CONTINENT

| Continent | Cases  |
|-----------|--|
| Europe    | “Arab Tower” (Spain); Archaeological Park of Paestum (Italy); British Museum (United Kingdom); Bulgarian Monasteries (Bulgaria); Cartagena (Murcia, Spain); Chartwell, Stourhead, and Upton (England); Four Sites in Castile (Spain); Heritage Buildings (Moldova); Historic Center of Bucharest (Romania); Island of Sant’Erasmo (Venice, Italy); Lincoln Cathedral (United Kingdom); Museums of Stockholm (Sweden); “Napoli Musei Aperti” (Italy); National Museum of Sculpture & Patio Herreriano (Valladolid, Spain); Noto (Sicily, Italy); Old Nice (France); Pergamon (Turkey); Royal Theatre (Denmark); Temple of Poseidon (Greece); Titanic Quarter (Northern Ireland); Tullin Block – Urban Heritage (Oslo, Norway); Various Urban Heritage Sites (Europe). |
| Americas  | Caminito Street (Buenos Aires, Argentina); Fort San Cristóbal (Puerto Rico); Historic Center of Quito (Ecuador); La Plata Museum (Argentina); Machu Picchu (Peru); Victorian House of Lewiston (USA).  |
| Africa    | Historic Center of Saïda (Lebanon, extended North Africa); Lake Tana (Ethiopia); Mar Mikhael District (Beirut, Lebanon – Africa / Middle East region); Medina of Fez (Morocco); Old Residence (Calabar, Nigeria – two cases); Saint-Louis, Historic City (Senegal); Tunis (Tunisia); Morocco (Generic Case).   |
| Asia      | Ankara Castle (Turkey); Changdeokgung Palace (Seoul, South Korea); Fouad Boutros Highway Project (Beirut); FRIM National Heritage Site (Malaysia); Georgetown Waterfront (Penang, Malaysia); Hoi An (Vietnam); Li River (China); My Son Sanctuary (Vietnam); Shat Gombuj Mosque (Bangladesh); Historic Temples (Thailand, ten detailed cases).   |
| Oceania   | Australian Study on Heritage Site Valuation (Australia).   |

TABLE II COST-BENEFIT ANALYSIS (CBA)

| Strengths   | Weaknesses   |
|---|--|
| <ul style="list-style-type: none"> <li>Standardized and well-recognized framework: the Machu Picchu case demonstrates that well-structured pricing can sustainably fund conservation.</li> <li>Cross-sector comparability: the Fouad Boutros highway project in Beirut enabled effective comparison with other infrastructure investments.</li> <li>Clear monetary outputs: Machu Picchu's rehabilitation exhibited measurable self-financing through ticket revenues.</li> </ul> | <ul style="list-style-type: none"> <li>Intangible values are often omitted, as in the case of Saïda's historic centre.</li> <li>Non-use values are poorly addressed: for example, significant value of San Cristóbal fortress remains unaccounted.</li> <li>Heavy reliance on speculative counterfactual scenarios.</li> </ul> |
| Opportunities   | Threats  |
| <ul style="list-style-type: none"> <li>Gradual integration of intangible components: Cartagena's evaluation already includes ecosystem services of heritage walls.</li> <li>Potential to incorporate sustainability thresholds into CBAs, as exemplified by Saint Louis, Senegal.</li> </ul>  | <ul style="list-style-type: none"> <li>Risk of reducing heritage assets (e.g., Noto) to short-term profitability.</li> <li>Discounting practices may prioritize immediate gains over patrimonial longevity.</li> </ul>   |
| Revealed Preference Methods (Hedonic Pricing, Travel Cost)  |  |
| Strengths   | Weaknesses   |
| <ul style="list-style-type: none"> <li>Based on observed behaviour: e.g., property premium in Old Nice and recreation surplus at the Poseidon temple.</li> <li>Robust econometric tools.</li> </ul>   | <ul style="list-style-type: none"> <li>Limited to direct use values: attachment to Fès Medina remains unexamined due to lack of market structure.</li> <li>Access to price or visitation data can be challenging, as in pre-cadastre Bucharest.</li> </ul>   |
| Opportunities   | Threats  |
| <ul style="list-style-type: none"> <li>Increasing digitization of real estate and tourism databases; GIS-enhanced calibrations already tested in Pergamon.</li> <li>Potential for designing local heritage taxation (Nice).</li> </ul>  | <ul style="list-style-type: none"> <li>Risk of conflating correlation with causation; e.g., rising rents in Titanic Quarter not solely due to heritage-related prestige.</li> <li>Policy-related and symbolic values may remain hidden.</li> </ul>   |
| Stated Preference Methods (Contingent Valuation, Discrete Choice)   |  |
| Strengths   | Weaknesses   |
| <ul style="list-style-type: none"> <li>Only approach fully capturing non-use values: e.g., expressed attachment to Noto's reconstruction or the Royal Theatre.</li> <li>Flexible design: local surveys (Naples "Musei Aperiti") or international contexts (Changdeokgung).</li> </ul>   | <ul style="list-style-type: none"> <li>Dependent on respondent honesty; strategic bias identified in Sant'Erasmo survey.</li> <li>Scenario abstraction may reduce realism, as occurred in Thai temple studies.</li> </ul>  |
| Opportunities   | Threats  |
| <ul style="list-style-type: none"> <li>Integration with participatory visualisation enhances scenario comprehension.</li> <li>Combined with conjoint analysis; Paestum case revealed marginal values for heritage services.</li> </ul>  | <ul style="list-style-type: none"> <li>Public credibility risk if WTP estimates appear unrealistic (Hoi An case).</li> <li>Results are highly sensitive to survey design.</li> </ul>   |

TABLE III SUSTAINABILITY-BASED MULTICRITERIA APPROACHES (AHP, ANP, GIS GRIDS)

| Strengths   | Weaknesses  |
|---|---|
| <ul style="list-style-type: none"> <li>Holistic perspective: Tunisian study combined economic, social, cultural, and environmental indicators.</li> <li>Broader stakeholder participation: workshops in Saint Louis involved officials, residents, and experts.</li> <li>Consideration of irreversibility: investment thresholds tested patrimonial vulnerability.</li> </ul> | <ul style="list-style-type: none"> <li>Complex parameterisation: successive AHP iterations needed to stabilise weights in Lviv.</li> <li>Translating results into rapid budget decisions can be challenging.</li> </ul> |
| Opportunities   | Threats   |
| <ul style="list-style-type: none"> <li>Alignment with SDGs and support from agencies like UNESCO and World Bank; Quito implementation illustrates compatibility with international funding.</li> <li>Particularly suited to Global South contexts with informal or underdeveloped markets.</li> </ul>   | <ul style="list-style-type: none"> <li>Risk of technocratic rejection if results appear overly complex.</li> <li>Potential political misuse in criteria selection.</li> </ul>   |

has been increasingly adopted in urban and heritage research as a framework for analyzing public policy, stakeholder systems, and methodological approaches (Hill, Westbrook, 1997; Sýkora, Bouzarovski, 2012).

• **SWOT Analysis** of Principal Economic Evaluation Methodologies for Urban Heritage

• **Implications** for the Multicriteria Sustainability Framework:

1. Empirical anchoring:

– Lessons from Saint Louis, Tunis, and Lviv indicate that a multicriteria framework strengthens public decision-making in Southern cities.

– Limitations observed in Nice (HPM) and Sant'Erasmo (CVM) highlights the need to integrate non-market values.

2. Recommended structure:

– Economic axis: includes CBA outcomes and revealed values (HPM, TCM).

– Social axis: derived from survey-based CVM/CE results.

– Environmental axis: focuses on resilience and ecosystem indicators.

– Cultural-identity axis: emphasises historical importance weighted through AHP.

3. Presentation and governance:

– GIS-based mapping (as with Pergamon) ensures intuitive interpretation.

## DISCUSSION

The cross-sectional analysis of the 60 case studies reveals a significant methodological diversity in the economic valuation of urban heritage, reflecting both the richness of the field and the lack of a unified reference framework. While many approaches draw on established paradigms from public economics or tourism economics, few integrate a truly systemic perspective grounded in strong sustainability.

The comparative matrix (Table V) underscores the limits of conventional methods (CBA, HPM, TCM) which, despite their economic precision, overlook intangible, social, and cultural dimensions. Stated preference tools (CVM, DCE) better address non-market values but remain data-intensive and context-sensitive. In contrast, multicriteria and sustainability-based approaches offer more holistic integration by combining quantitative and qualitative indicators. They align with strong sustainability principles, although they require careful indicator design and participatory calibration. Overall, hybrid and context-adapted tools appear most suited for valuing the complex nature of urban heritage.

The sector diagram (Fig. 3) reveals a pronounced methodological asymmetry in the study corpus. Stated preference techniques dominate, with the Contingent Valuation Method (CVM) alone accounting for just over half of all applications (52%). This hegemony confirms the discipline's long-standing reliance on willingness-to-pay surveys to cap-

TABLE IV CROSS-METHOD SUMMARY

|             | Strengths  | Weaknesses  | Opportunities  | Threats  |
|-------------|--|---|--|--|
| All Methods | Solid academic foundations, encompassing well-established methodologies such as Cost-Benefit Analysis (CBA), Contingent Valuation Method (CVM), Hedonic Pricing Method (HPM), and Analytic Hierarchy Process (AHP).<br>Existence of international normative frameworks and methodological guidance issued by institutions like UNESCO, OECD, and ICOMOS.<br>A broad spectrum of empirical applications, ranging from emblematic cases such as Machu Picchu to urban rehabilitation experiences in Cartagena. | Persistent reliance on monetary valuation tools, which often struggle to capture intangible cultural and symbolic values.<br>Tendency to overlook or inadequately reflect local specificities, as observed in heritage sites like the Casbah of Algiers or various North African medinas. | Growing societal demand for sustainability, social inclusion, and participatory heritage governance provides fertile ground for methodological innovation.<br>Promising integration with Geographic Information Systems (GIS), spatial modelling techniques, and circular economy principles to enhance contextual relevance and decision-making accuracy. | Excessive standardisation risks erasing territorial diversity and reducing heritage valuation to technocratic checklists.<br>Risk of heritage appropriation by institutional elites, marginalising local stakeholders and limiting democratic engagement.<br>Ongoing tensions between heritage preservation objectives and increasing land pressure in urban contexts. |

TABLE V COMPARATIVE ASSESSMENT OF ECONOMIC VALUATION METHODS IN URBAN HERITAGE CONTEXTS

| Method                                   | Economic Accuracy | Integration of Social/Cultural Value | Institutional Accuracy | Environmental Coverage | Required Data                      | Ease of Communication                       | References                                       |
|--|-------------------|--------------------------------------|------------------------|------------------------|------------------------------------|---|--|
| <b>Cost-Benefit Analysis</b>             | High              | Low                                  | High                   | Low                    | Reliable monetary data             | High  | Tajani et al. (2016)<br>Tisma et al. (2021)      |
| <b>Revealed Preferences</b>              |                   |                                      |                        |                        |                                    |   |  |
| <b>Hedonic Pricing Method (HPM)</b>      | Medium            | Low to medium                        | Low                    | Low to medium          | Market data                        | Medium                                      | Rosen (1974)<br>Freeman (2003)                   |
| <b>Travel Cost Method (TCM)</b>          | Medium            | Low to medium                        | Low                    | Low to medium          | Market data                        | Medium                                      | Clawson, Knetsch (1966)<br>Freeman (2003)        |
| <b>Stated Preferences</b>                |                   |                                      |                        |                        |                                    |   |  |
| <b>Contingent Valuation Method (CVM)</b> | Medium            | Medium to high                       | Medium                 | Medium                 | Extensive survey-based data        | Low to medium                               | Mitchell, Carson (1989)<br>Bateman et al. (2002) |
| <b>Discrete Choice Experiments</b>       | Medium            | Medium to high                       | Medium                 | Medium                 | Extensive survey-based data        | Low to medium                               | Bateman et al. (2002)<br>Hanley et al. (2001)    |
| <b>Multicriteria Analysis</b>            | Medium to high    | Medium to high                       | High                   | High                   | Mixed (quantitative + qualitative) | Medium to low (depending on simplification) | Pujol et al. (2024)                              |
| <b>Sustainability-Based Approach</b>     | Medium to high    | High                                 | High                   | High                   | Mixed (quantitative + qualitative) | Medium to low (depending on simplification) | Dalmas et al. (2014)                             |

ture non-market values, but it also signals a potential vulnerability: over dependence on data intensive instruments that are sensitive to survey design and respondent bias.

Travel Cost Method (TCM) occupies a distant second position (15%), highlighting the weight still given to recreational use values derived from observable behaviour. The modest share held by Hedonic Pricing (3%) and pure Cost-Benefit Analysis (3%) suggests that property-market signals and conventional public-economics tools remain ancillary rather than central in recent heritage research.

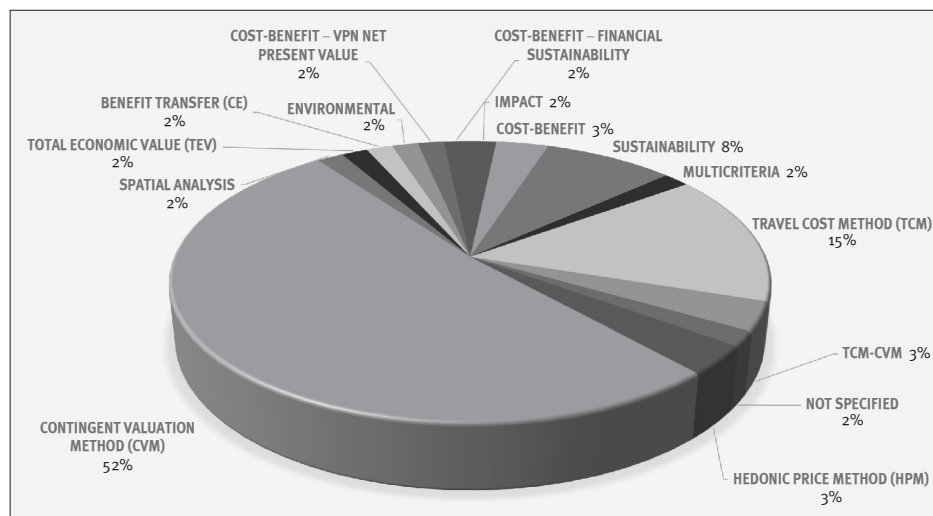
Notably, approaches explicitly framed by strong sustainability (multicriteria models and dedicated sustainability metrics), collectively reach only 10% (8% + 2%), indicating that holistic, cross-pillar evaluations are still emerging rather than mainstream. Equally under-represented are spatial analyses, TEV extensions, and benefit-transfer studies (each 2%), all of which could enhance transferability and contextual nuance.

The corpus is skewed toward monetised, stated-preference techniques, signalling a

need to diversify toward integrative, sustainability-focused approaches.

While most existing studies remain concentrated within Euro-Mediterranean contexts, this research adopts a broader perspective by incorporating case studies from all continents. This global coverage – encompassing

FIG. 3 SECTOR DIAGRAM SHOWING THE DISTRIBUTION OF ECONOMIC VALUATION METHODS WITHIN THE STUDY CORPUS



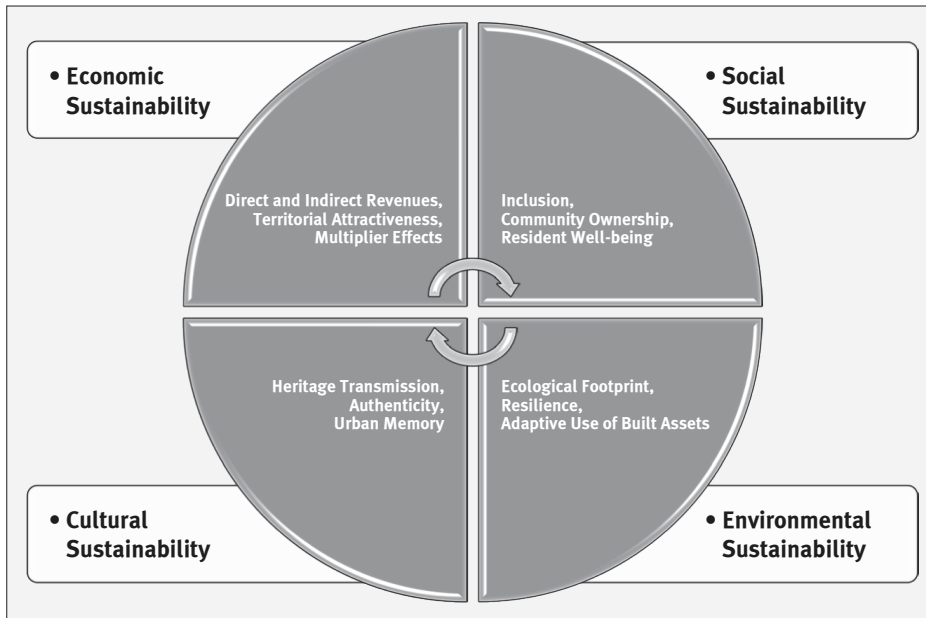


FIG. 4 THE FOUR KEY DIMENSIONS OF STRONG SUSTAINABILITY

Europe, Americas, Africa, Asia, and Oceania – helps overcome the commonly observed geographical bias and enables the assessment of indicator relevance across diverse heritage and socio-spatial contexts.

The critical meta-analysis of economic valuation methods highlights that no single approach (monetary or otherwise is sufficient to account for the complexity of urban heritage). Traditional techniques: cost-benefit analysis, hedonic pricing, contingent valuation, each offer useful insights into specific aspects of heritage value (financial flows, implicit preferences, public attachment). Yet, they tend to isolate one dimension at the expense of a holistic reading. Hence the need to combine them within a more comprehensive framework, capable of capturing the multidimensional nature of historic sites.

The multicriteria approach based on strong sustainability meets this ambition by aligning economic, social, cultural, and environmental criteria with the pillars of sustainable development. It ensures that the preservation of heritage capital is central to valuation processes. Although still emerging in heritage economics (Pujol-Galindo et al., 2024 qualify it as a “new research frontier” in the field), this approach has shown promise in pilot studies (participatory multicriteria assessments conducted in Cartagena, Murcia) and is increasingly endorsed by international institutions.

• **Development of a Multicriteria Grid Based on Strong Sustainability** – Building on the previous findings, a multicriteria analytical grid was developed, structured around the

four key dimensions of strong sustainability (Dalmás et al., 2014; Throsby, 2001; Fig. 4):

- Economic sustainability (direct and indirect revenues, territorial attractiveness, multiplier effects).
- Social sustainability (inclusion, community ownership, resident well-being).
- Cultural sustainability (heritage transmission, authenticity, urban memory).
- Environmental sustainability (ecological footprint, resilience, adaptive use of built assets).

Each axis was operationalized through a combination of qualitative and quantitative indicators, selected from international best practices (World Bank, 2012d; UNESCO, 2011) and adapted to Mediterranean contexts. Indicator weighting was tested using the Analytic Hierarchy Process (AHP), with the aim of applying the framework to complex historic sites.

Data collection relied on a triangulation strategy combining semi-structured interviews with local stakeholders and experts, analysis of policy documents and technical reports, and spatial data processing using GIS. A pilot zone was selected to test the framework, with the intention of ensuring future scalability and transferability to other heritage contexts.

The resulting grid integrates tools rarely combined in earlier studies, and provides a means to assess the economic value of heritage beyond market uses. It captures intangible aspects such as symbolic anchorage, social regeneration potential, and leverage effects on sustainable urban transitions. In this way, the grid reflects the logic of strong sustainability, where each dimension must maintain its critical integrity and cannot be sacrificed for gains in another.

• **Operational Steps and Analytical Tools** – The implementation of the grid followed a structured process encompassing four main phases. The first phase consisted of defining the sustainability dimensions and associated indicators. Drawing from the framework proposed by Vernières et al. (UVSQ, 2012c) for urban heritage, the analysis identified four interdependent dimensions:

- (a) Economic (e.g., income-generating activities, local employment, conservation costs).
- (b) Social (e.g., living conditions, equity, social cohesion, community appropriation).
- (c) Cultural (e.g., authenticity, identity, intangible heritage, transmission of know-how);
- (d) Environmental (e.g., condition of built fabric, urban landscape, ecological impact of interventions).

For each dimension, a set of relevant indicators was selected with a strong emphasis on

the principles of strong sustainability. For instance, built environment indicators included structural stability indices or risk-of-collapse thresholds, while cultural sustainability incorporated an index of cultural vitality (e.g., number of traditional craft practices still active, degree of intergenerational transmission). Social sustainability was assessed through indicators such as community engagement rates or socio-functional diversity indexes. The economic dimension, beyond classic financial indicators, included local viability metrics (e.g., share of local firms involved in rehabilitation, use of local materials and labour).

Each indicator was linked to a clear objective or threshold (maintaining housing vacancy rates below a specific percentage, or ensuring the continued activity of a minimum number of traditional artisans). This threshold logic reflects the non-substitutability premise of strong sustainability, wherein no dimension should fall below its critical minimum.

The second phase focused on data collection and methodological tools. It combined:

- Documentary and historical analysis to understand the site’s evolution, legal status, and prior interventions.
- Fieldwork and interviews with residents, users, and experts to gather qualitative insights into social and cultural dynamics.
- Geographic Information Systems (GIS), such as ArcGIS, to spatially map heritage conditions, accessibility, and risk zones.
- Data processing tools, including Excel for score compilation, and where applicable, multicriteria decision-making software (e.g., ELECTRE, PROMETHEE, or simplified scoring matrices).

An essential feature of this phase was the participatory component: local workshops were organized to validate indicator selection and collect qualitative inputs. This approach aimed to foster ownership of the framework by local actors and to ensure its contextual relevance and legitimacy.

• **Multicriteria Evaluation, Scenario Simulation, and Sustainability Diagnostics** – Once the indicators were populated, the third phase consisted of a multicriteria evaluation of the heritage site and a sustainability diagnosis. A synthetic dashboard or radar diagram was constructed, whereby each axis represented one sustainability dimension (economic, social, cultural, environmental), and the value of each indicator was plotted against its target threshold (the “outer radius” of the diagram).

This graphic representation helped identify areas requiring immediate intervention. For

instance, a site could approach critical thresholds in the “built environment” dimension (numerous buildings at risk of collapse), suffer from economic underperformance (low tourist revenues, insufficient funding), but still display strong social and cultural vitality (active community networks, living traditions). Such a profile reveals unbalanced sustainability and signals where priority actions should be focused.

Crucially, strong sustainability requires that all dimensions meet a minimum standard, excellence in one cannot compensate for deficiencies in another. A site with serious physical deterioration, even if economically profitable, would still be considered unsustainable from a heritage standpoint.

For each, projected values indicators were entered into the grid. The results revealed trade-offs: for example, a tourism-focused strategy might enhance the economic score but jeopardize authenticity or community well-being. In such a case, the scenario would be rejected if it fell below critical thresholds in cultural or social dimensions. The multicriteria tool thus enabled a comparative and balanced assessment of strategies, aligned with strong sustainability principles.

The practical implementation of the proposed framework may face several challenges, including limited data availability, institutional constraints, and the costs associated with collecting qualitative information. However, these obstacles do not undermine the relevance of the multicriteria grid; rather, they highlight the need for contextual adaptations and pilot applications. In this regard, the proposed approach should be viewed as a flexible decision-support tool, designed to progressively integrate economic, social, cultural, and environmental dimensions into heritage evaluation processes.

• **Strategic Recommendations, Transferability, and Final Considerations** – Based on the diagnostic results, the multicriteria grid supported the formulation of balanced recommendations. For example, if the analysis revealed structural fragility in the built environment, the priority would be to reinforce or restore key buildings before pursuing tourism development. If cultural vitality appeared threatened (due to declining artisanal activity), measures to support knowledge transmission and local craftsmanship would be proposed. Similarly, if infrastructure expansion projects (such as parking facilities) posed risks to visual integrity or authenticity, the grid allowed for the objectification of trade-offs between accessibility and preservation.

Visual tools (such as sustainability radar diagrams or weighted scoreboards) were used

## GLOSSARY OF KEY CONCEPTS

**Economic Valuation:** The process of estimating the total monetary value of cultural heritage assets, including both market and non-market benefits. It demonstrates how heritage contributes to collective welfare and sustainable development beyond economic profitability.

**Multifaceted Benefits** (tangible and intangible): Heritage generates tangible benefits such as tourism and employment, and intangible ones such as identity, memory, and social cohesion. These interlinked dimensions sustain cultural vitality and community resilience.

**Cost-Benefit Analysis** (CBA): A quantitative method comparing the overall benefits and costs of a heritage project to determine its social efficiency. However, traditional CBA often fails to include intangible cultural and social values.

**Positive Externalities:** Positive impacts produced by heritage that are not reflected in market transactions, such as cultural pride, educational value, or aesthetic enrichment. These social benefits justify public support for heritage conservation.

**Total Economic Value** (TEV): A comprehensive framework that encompasses direct use, indirect use, and non-use values (existence and bequest). TEV reflects both tangible and intangible motivations for heritage preservation.

**Conventional Valuation Methods** (CBA, HPM, TCM): Traditional approaches, including Cost-Benefit Analysis (CBA), Hedonic Pricing Method (HPM), and Travel Cost Method (TCM), use market data to infer value. Despite their precision, they overlook social and cultural dimensions.

**Stated Preference Methods** (CVM, DCE): Survey-based techniques such as Contingent Valuation (CVM) and Discrete Choice Experiments (DCE), which elicit individual's willingness to pay for heritage preservation. They are particularly suited to measuring non-market and intangible values.

to communicate findings to both decision-makers and the general public. These synthetic representations facilitated a holistic understanding of the evaluation, reinforcing the idea that heritage must be approached as a living system, not a static asset. They also emphasized that heritage governance should seek a balance between dimensions, not the maximization of any single indicator.

By adopting this approach, urban heritage sites are no longer reduced to financial burdens or tourist assets, but are understood as complex, dynamic systems where material conservation, local livelihoods, economic viability, and cultural transmission are jointly addressed. This model aligns with the growing consensus among international institutions and heritage scholars advocating for a stronger integration of cultural, social, and environmental values in heritage planning (Getty, 2021; UNESCO, 2011).

More specifically, it echoes the Historic Urban Landscape (HUL) approach promoted by UNESCO, which encourages a shift from isolated conservation interventions to integrated, participatory, and context-sensitive frameworks. The multicriteria tool proposed here offers an operational embodiment of these principles. It helps ensure that future decisions do not sacrifice one dimension of heritage (e.g., authenticity or social cohesion) for gains in another (e.g., economic profit), a constraint explicitly embedded in the logic of strong sustainability.

In conclusion, the multicriteria grid grounded in strong sustainability offers a novel and comprehensive approach to heritage valuation. By bridging environmental economics with holistic value theory, it enables the assessment and governance of urban heritage sites in a manner that is both rigorous and adaptable. This tool equips policymakers with a forward-looking framework that respects cultural non-substitutability while optimizing heritage contributions to current and future urban well-being. In this sense, it provides the conditions for fully embedding heritage conservation within the paradigm of sustainable development.

## CONCLUSION

This study offers a critical reassessment of economic valuation methods applied to urban heritage, emphasizing the need to move beyond conventional monetary approaches toward more inclusive and sustainable analytical frameworks. By integrating the principles of strong sustainability into a multicriteria evaluation process, a structured assessment grid was developed to better capture the multifaceted value of heritage in diverse urban contexts.

The results demonstrate the effectiveness of this method in guiding trade-offs between conservation, enhancement, and spatial planning, while maintaining cultural, social, and environmental balances. Far from being a static model, the proposed tool offers a flexible foundation for supporting public decision-making and fostering the co-construction of heritage strategies tailored to local specificities.

By combining analytical robustness with contextual adaptability, this research contributes to the development of renewed methodological standards that can support the evolving trajectories of historic cities toward more equitable, sustainable, and intelligently governed models.

Ultimately, this work seeks to open a space for dialogue between researchers, practitioners, and policymakers by proposing a method that is reproducible, adaptable, and grounded in objective, place-based, and forward-looking criteria. It calls for a broader recognition of heritage as a strategic lever for urban transition and social cohesion.

Finally, further development is needed to test the grid's operational robustness and transferability through its application in urban redevelopment, cultural planning, and heritage management projects. Such extensions could consolidate its role as a decision-support tool and a catalyst for sustainable heritage-led urban transitions.

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- SOURCES OF ILLUSTRATIONS AND TABLES
- FIGS. 1-3 Authors, 2025
- FIG. 4 Authors, 2025, from: DALMAS et al., 2014; THROSBY, 2001
- TABLES I-VI Authors, 2025

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