

The Need for A Wider Application of the Total Economic Value Theories

A Possible Solution to the Underestimation Issues Related to Some Market Appraisal Methods for Public Goods and Services

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Abstract—The social surplus is constantly influenced by positive and negative externalities, though they generally do not influence market prices of goods/services in a direct way. The internalization of negative factors can never be considered complete, as it can only be accomplished by charging the related costs to those who caused them in the market. Since those costs would always represent only a partial compensation for the damage they caused, the internalization will always be incomplete. A possible solution to this issue is applying the Total Economic Value theories in all the assessment activities that could imply a relevant underestimation of non-use values in the formulation of market prices.

Keywords—Total economic value; willingness to pay; Environmental Economics; economic justice, market value appraisal

I. THE ROLE OF ECONOMIC JUSTICE

The State, in its different structures and articulations, must have a relevant role in the activities related to protection, promotion and conservation of Cultural Heritage, Landscape, Environment, and all those public assets and services that, for their special economic nature, cannot be completely and exhaustively valued and appreciated by the market [1]. Public assets/services (or those having a public relevance) represent, indeed, a category of goods, for which the market is unable to guarantee efficient supply. In this case, the reference to the public connotation is not limited to a specific profile in terms of ownership of goods, which can also be private, but it refers to the specific features of those assets [2]. Public assets are goods to which individuals assign a value, but which may not be efficiently produced and offered on the market, due to the complexity (or impossibility) of attributing a price to them [3].

Public assets usually meet a market failure in the determination of their price, differently from what Mill theorized, and in the management of their continuous and efficient management and supply [4]. In such a situation, markets and price systems do not signify the impact of goods on individual wealth [5]. In similar instances, it is impossible to exclude someone from consuming those goods (the so-called 'impossibility of exception'). For Public goods and services, the excludability principle cannot be applied: this attribute is related only to some limited goods [6], e.g., users pay an entrance fee for museums and exhibitions, or even for churches and some other historical buildings, which can have different limited access policies [7].

The problem of understanding how different public resources work and including them in a single definition does not reduce the issue, as they can be all assimilated to Public assets/services, even when they behave like intermediate goods [8]. This last group is in between of the two extreme classes, i.e., privately owned consumer goods, which are exclusively appropriable, and genuine public goods, for which competition and excludability are not able to prevent individuals from using and consuming them [9]. In addition to non-excludability and unrivalled consumption, another feature that makes Public assets/services unique and unmanageable from markets is that they can produce several positive effects, for which beneficiaries do not have to bear any costs [10].

These effects, which influence the role of externalities, can be benefits (positive) or costs (negative) related to an economic asset, for which there is no explicit market compensation [11]. The consequence of externalities and their role in the markets is that private and public costs differ in the way markets are attributing them an efficient value [1], and, therefore, there is a significant underestimating effect in their prices, when they are available. In such instance, Economic theories postulate that consequences of market failures are over-exploitation [12], the impossibility of setting an adequate price and the phenomenon of free riding [1]. Because of the impossibility of setting a price, markets do not produce sufficient non-excludable goods, and, for this reason, public goods are generally supplied collectively by the State and its bodies and paid by individuals through taxes [8, 14].

From a certain point of view, Public resources are typical non-marketable goods. In fact, they have a dual nature [11]. On one hand, they are pure non-excludable goods, as far as non-use values are concerned, on the other hand, they can be considered mixed goods with non-marketable features [12], plus, they fall into the category of goods that have a great importance for positive externalities [9], and that is why public institutions, but also customers and private institutions that aim to improve collective wealth, take significant measures to ensure their production, conservation, and enjoyment [10].

The Italian Project Appraisal tradition recognizes that economic valuations should concern every occurrence, to understand how to administer the Economic Justice [8]: with it we cannot avoid comprehending, in the unquestionable multiplicity of micro-behaviors, the most recurrent and regular ones. This is fundamental to determine a result that is

economically fair, and collectively acceptable, for subjectivity is unacceptable in Appraisal Sciences [4, 5]. This objectivation process in the research about human and social behavior cannot ignore the natural consciousness of the complications related to collecting acceptable datasets, in terms of quantity and quality, dealing with singular and indifferent use choices for similar assets, for they have the same comparable features [8]. For some kinds of assets, e.g., environmental, and cultural heritage, it is almost impossible to identify conditions of perfect equality [4, 5]. Generally speaking, the problem is considerably expanded in its outlines and contents.

II. THE VALUE OF NON-MARKETABLE GOODS

The evaluation of public goods and services is similar to the estimation of the value of an asset that has no market [13], including environmental ones. It is fundamentally based on the concept of 'intrinsic value' of a given asset/service [12], which in turn can be divided into three main components: the existence, the heritage and the bequest value. According to the theories of the Italian traditional Project Appraisal Sciences (called 'Estimo'), the taxonomy of economic values generally attributed to public goods and services includes at least three kinds of value for each of them, that can be summed up in the Total Economic Value or TEV [13]: the actual social use values (be them direct, or indirect), the option values and the non-use values, be them present, or future (called, respectively, 'existence value', 'bequest value' and 'heritage value'). There are several different definitions of the components of the TEV, depending on the kind of assets/services it is estimated for and the specific conditions it is calculated in [14].

As can be deduced from the taxonomy of the economic values ascribed to public goods [13], there are mainly two kinds of values, when we consider the relationship between assets and their reference subject, i.e., values linked to the good as such, and values identified by the relation they have with a given subject [15]. The science that has historically dealt with understanding the relationship between goods and subjects is Economy, which, in general, can be defined as a discipline based mainly on the ability to understand the drives that determine how subjects acting on markets behave and their relations with available resources [11], generally defined as 'Economic goods', which are traditionally described according to their use values.

For the theories of Classical Economy [13], Economic Goods and Services are the main target of evaluation activities, since material resources, defined by certain specific features [12], i.e., *a*) large availability (since an economic asset cannot be inaccessible and, therefore, the relative accessibility and use possibilities must not be limited in absolute terms), and *b*) the chance of defining their right (of using them) for a person (be it single, or collective). There are several classifications of Economic Goods and Services [15], which contemplate different facets of resources themselves, such as materiality, mobility, structure and, above all, the ownership rights, which lead to a fundamental division of economic goods into public and private resources [16].

From the need of measuring the use values of public resources, of assessing the effect of positive or negative externalities, to which they are subject, and of taking them into account in development strategies, two fundamental disciplines were developed, such as Environmental Economy [15] and,

above all, Economic Appraisal Sciences [11]. These last ones deal both with the estimation of the value of natural resources, assessed in terms of use values in a social function [13], and with the impact of human activities on the environment, to assist the competent agencies in the decision-making process [16], aimed at approving, suspending, or modifying projects and/or plans [17]. The topics, that Economic Appraisal Sciences deal with, also include estimation methods and Real Estate evaluations, with specific reference to cultural heritage.

A. *The economic value of public assets*

Public goods and services have a special nature, as for them the principle of exclusion from benefits and competition in consumption does not apply [17], plus, they cannot be exchanged normally within a market, fact that makes it impossible to create a direct monetary reference for them [13]. Nevertheless, they are still considered economic resources, as they are characterized by economic features, such as accessibility and availability in limited quantities [15], in addition to the natural growth rate of demand - which is potentially infinite - considering their supply curve, that is very limited in actual markets [18]. Furthermore, those goods, and the services they generate, satisfy public interests, which are generally available to the society as a whole, free of charge and across the board. In general, therefore, public goods do not have a market-established price, which is due to the impossibility of trading them [15]. Nevertheless, the State sometimes enforces the payment of tolls and taxes, which, unfortunately, have a purely symbolic meaning [19].

Should there be problems of interference in the use of the same good/service between different consumers, the definitions available in the literature introduced the concept of mixed resources [13], as they retain the main features of public assets, but are not fully usable by the whole of society, free of charge and across the board, as they have a sort of excludability profile [12]. The most cited example of this kind of assets/services is related to the payment of a ticket to access to public transport or museums, or the overcapacity of a natural reserve [15].

It should be noted, however, that the lack of a market price directly determined by the same does not mean that public goods do not have an economic value [13], quite the opposite, as the value ascribed to these assets/services is strongly linked to their utility level, perceived by relevant users, expressed in terms of use value, and generally measured in terms of Willingness to Pay (WTP), or Willingness to Accept (WTA). Public goods can also be appreciated regardless of their use, in fact, the functions that disregard their actual use are more significant [15], as they consider the non-use values, which are divided into three main categories (option, existence and bequest values), which will be discussed in the next paragraphs. In this sense, it is based on the growing interest linked both to the benefits, that public goods provide to communities, and to their increasingly scarce availability.

The most important prerequisite for the economic appreciation of public assets and services can be identified in their use [13], hence the identification of their use values. In addition to that, the perceived utility for consumers in relation to those goods and services is closely linked to their ability of using them, therefore, the use value of a park, a river, a building of high cultural or landscape value or a work of art is

established in the user thoughts during their use activities [15]. This means that public goods are valuable resources not only because of their economic value [10]. Alongside this, in fact, there can be aesthetic values, spiritual values, historical values, symbolic values, which together constitute the so-called cultural value [9].

The fact that public goods have a value does not mean they can have a price, because of their peculiar nature [10]. Meaning, it is generally not possible to rely on market prices, especially for their benefits, but also for their costs, even though to a lesser extent [13]. The distinctiveness of the Economic Appraisal Sciences for public assets is that - differently from any cultural evaluation, which is based on the judgment of critics, professionals, and experts - the derivation of values ascribed to public goods or services is sourced in the individual preferences of citizens, through the WTP/WTA [15].

Economic theories, in fact, presume that collective wealth is determined by the satisfaction of individual preferences [4, 5]. From this point of view, a benefit is defined as anything that increases individual wealth, and a cost is what reduces it [ibidem]. The aim of any economic evaluation is, therefore, assessing the benefits that current or future consumers receive, or will receive, from public goods [15]. Considering that, however, it should be noted that the citizens assessment expresses not only a direct economic utility (the expectation of receiving a monetary benefit, though deferred in time; see 5), but also personal considerations about the social and cultural value of evaluated assets [4]. In other words, the whole range of values that can be attributed to a cultural asset can be considered in economic terms only as result of individual benefits (or costs) that can be appreciated by their users [13]. It is, therefore, natural to recognize that estimating the economic value of public goods and services can be complicated, as it is not related to their use [15].

III. THE TOTAL ECONOMIC VALUE THEORY

The total economic value (VET) includes the explicit value of benefits coming from goods/services use (direct and indirect) and the implicit value of its benefits, independently from the direct consumer use. These last factors correspond to the option and the non-use values, which can be divided into several categories, i.e., the option/quasi-option, or the existence, the heritage, and the bequest value [5]. The VET is, then, the sum of the components of direct use value, indirect use value and non-use values, which include option, existence, bequest, and heritage values in different ways, depending on the kind of asset it is attributed to [15], though some public goods and services may also be used in a private way, depending on their nature and specific features.

The direct use values are related to the use of the public assets and services, as the benefit visitors derive from visiting a park, or a museum, or the utility we get from the quality of the air that we breathe [13]. The direct use values or market actual values come from the chance of actually enjoying a given asset/service to get benefits from it in terms of utility [14]. This kind of values determines market prices, established by the relation and balance between supply and demand [11]. E.g., it includes the chance of benefiting from tangible and intangible services directly provided by natural resources and the environment [15].

The indirect use values refer to benefits/costs that individuals get indirectly from public goods/services, such as economic benefits/costs coming from new public transportation lines and stations [14]. The indirect or non-market actual values come from the (positive/negative) effects that a given asset or service produces to a subject, regardless of whether he or she can actually enjoy it by using it [15]. It can be established also for public goods and services that are necessary for any community [10], but of which we are often unaware. E.g., it includes the chance of benefiting from the indirect services offered by environmental resources (such as landscape and different representations of the environment).

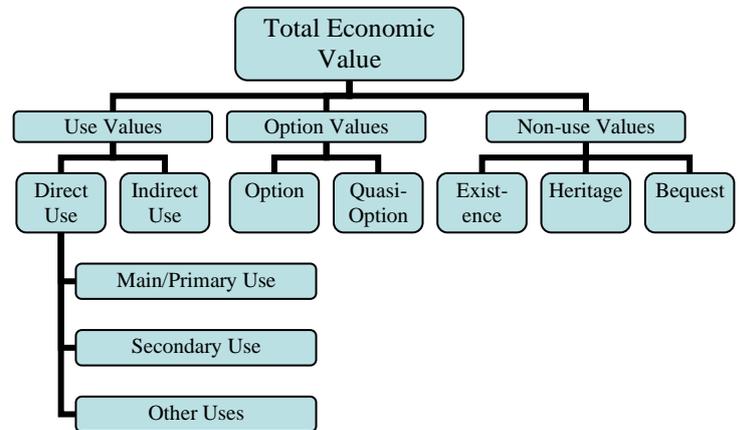


Fig. 1. The Total Economic Value general structure.

A. Option values

The option values refer to the value of ensuring a possible future use of public goods and services [15]. Through a correct management strategy, individuals can take care of the chance of somehow using public goods/services in the future [ibidem]. The option value could be defined as a sort of ‘insurance premium’: it is linked to the users wish to ensure the availability of a good/service in the future. It is traceable to the current use of a given asset/service, that turns out to be in the charge of other individuals compared to the subject to which it refers, highlighting, however, the option for a possible future use by the reference individual or future generations [13]. In this sense, it can be defined as the WTP of the reference subject to ensure the future use of a given resource, which is not reproducible, or whose future availability is uncertain [15].

The option value can also be recognized as the cost that consumers are prepared to pay for to ensure the existence of a good/service, even though it is not possible to take advantage of it today [14]. This category of values refers to goods/services, which have the potential capability to create a future economic benefit to a specific subject [17].

Some authors [11, 13, 16] also combine this category with the so-called ‘quasi-option’ value, identified by other authors also as ‘bequest value’, though this last one should be referred to non-use values, a different group of values, compared to option values, which still refer to a possible use and utility, but differed in the future, or under specific circumstances [15]. It is decidedly close to the sensitivity that has spread after the acquisition, by the general public, of the concept of sustainability [4, 5], since this concept is based on the maintenance of future options in the presence of any factors of

uncertainty and irreversibility, taking advantage of the economic concept of utility, but referring to an uncertain, or partially unknown resource [13].

The option values represent, therefore, the value of preserving the option of using a certain asset/service in the future [4, 5]. This concept is widely used in Cost-Benefit Analysis (BCA), in which it generally represents the value of postponing any decisions under conditions of uncertainty [13], but it can also be used to evaluate the chance of preserving the ecological functions deemed necessary for future generations (obviously, as required by the definition of the concept of sustainability), which, if they fail, would represent a decrease in the use options for future generations themselves [15].

B. Non-use values

Non-use values are completely independent from individual use values ascribed to any public good or service [13]. They can be altruistic, such as the value of heritage and bequest, which come from knowing that others can use the good/service itself, or the value of existence, which consists in attributing a positive value to the existence of a public asset/service, independently from the fact that someone can use it [4, 5]. It is in this category that most of the non-market values fall [15].

The existence value is, then, linked to the chance of preserving a good/service from possible destruction [4, 5]. It comes from recognizing the intrinsic value of a given asset/service and it exists independently from the reference individual expression of a possible preference [15]. In fact, it is based on two fundamental factors, namely the existence of a resource/service, and the chance of making it 'available' for the future [5]. The existence value is closely linked to ethical and altruistic issues, mainly when the community feels compelled to protect public goods for their intrinsic value and not for the utility that they can produce [9]. An example of this concept is the WTP to ensure the preservation of ecosystems and animal species, regardless of the use that can be made of them.

The altruistic values are very close to the option and quasi-option value [15], mainly in the bequest components. This category, linked to the chance of taking advantage of a certain asset/service by actual (heritage) and future (bequest) generations [4, 5], is based on the awareness that the preservation of a given resource/service can guarantee its use to actual and future generations. That is why, in addition to what is postulated by the concept of sustainability [13], this principle is closely linked to the value of direct and indirect use and the chance of using the good in the future.

IV. MONETARY VALUES FOR PUBLIC GOODS

The problem of assessing the monetary value of an asset finds a first fundamental difference in the need to quantify the value of goods and services [17]: there are two main possible instances, i.e., situations in which the relative set of non-use values is predominant [5], and the categories for which a monetary value cannot be directly identified [4]. In this sense, considering public goods and services, it is important to assess how and how much the different components contribute to the development of the TEV of a given asset/service, since several factors can be measured, such as market demand, resources availability, but also their serviceability, usability, and commutability [9].

As said, one of the methods, that is mostly used to appraise the so-called 'taxonomy' of the economic values of public goods/services, is based on establishing the TEV of a given asset/service and its components, i.e. the total use values, which in turn are divided into real or present and option values, and the intrinsic or non-use values [14]. In other words, the TEV of a public asset or service is the sum of its components in terms of use, option, and non-use values (including, as described above, quasi-option, existence, heritage, and bequest components).

Considering how to establish the VET, many different methods can be identified in the literature for estimating the relative economic value of public goods, based, essentially, on the chance of recreating somehow a certain market situation [4, 5], that leads involved subjects to state and articulate their demand level towards the good/service itself. The literature basically identifies two ways of recreating the relation between public goods/services and their reference market [*ibidem*], using both existing (or surrogate) markets, and hypothetical models. The VET estimation may, therefore, concern both goods/services traded on markets and goods/services for which there is no direct reference to markets [11]: in such instances, considering public goods, it is necessary to refer to a simulation of a possible reference market [4, 5]. Another important factor to ponder is that market values exist out of time and space, but their absolute reference figures, i.e., prices, reflect a specific 'historical condition', representing market environments at a given time and in a specific location [14], differently from estimated values, which, although being referenced and rooted in markets [18], are essentially based on a predictive process, expressed through a value judgement [13].

The problem, then, dodges out of the pure public dimension and spans on a higher quality level, in which some ideal values can be merged with pure economic ones [15]. This is valid also for heritage and environmental goods and services, for which some values can be established following market trends [14]. In an objective situation of concurrent crisis in terms of traditional governance models, the Assessment and Economic Disciplines are still ignoring some of the dynamic and evolutionary features in the management, preservation, and valorization of public goods and services [6].

The preservation and valorization approach to public goods and services should, then, focus on an 'economic rationality', encompassed with a preservation and sustainability attitude [9]. The relations between economic and strategic components of preservation, and valorization of public goods and services could, then, be seen through a new light, considering the non-use values prevailing on market trends. That is why, looking for optimal equilibrium conditions within a highly structured and complex system of relations, it should be contemplated that the solely reference to markets cannot be appropriate and satisfactory anymore, mainly in the actual conditions.

It must be recognized, therefore, that the market is only a system, that can essentially link goals to means [4, 5]: the market alone cannot formulate goals on its own, nor it is able to establish any judgments on their relative value [*ibidem*]. At the same time, it is difficult to fulfill, in every event, the need for wealth of a given community, without being able to depend only on the chance of using public resources, which have become increasingly scarce [15]. In similar instances, the

definition of new strategies is fundamental. On one side, new adapted market conditions should be encouraged, in order to include other values and prices, referring to an enlarged sustainable economic logic (which involves also non-use values). On the other hand, two primary needs must be met, both reflecting the two main categories of the VET: preservation of public goods and services and socio-economic progress and development [4]. All in the light of a wider application of the principles of Economic Justice and Location Equity, through a careful analysis of price figures and an equitable prediction of their effects [5].

A new enlarged approach requires transparent knowledge of the relations between private, mixed, and public goods and services, excluding any use of implicit value judgments [13], as it requires new models to explain any changes in utility functions [14]. The only way of interpreting collective mindsets towards public goods and services use, management, and preservation can be, then, investigated through datasets [15], coming directly from the elicitation of preferences and behaviors [4, 5].

This is even more important considering that the implementation of any investment project does not represent an immediate economic operation [7], in fact, in most cases, costs and revenues associated with the achievement of any goals are distributed over a predetermined period [15]. Financial performances that occur at different times are not, of course, homogeneous, therefore, it is not possible to simply sum costs and revenues algebraically, without previously making their quantification consistent from a temporal point of view [16]. In this sense, the cost-revenue analysis aims, precisely, at estimating costs and revenues of an investment, for each homogeneous period related to it, making its annual balances consistent with respect to a common temporal reference, generally bringing them all back to current events [17]. These purely economic and financial performances cannot provide, unfortunately, a wider appreciation of non-use and option values, reflecting a more urgent need of enlarging common market views, when public goods and services are involved.

V. A NEW APPROACH TO THE ECONOMIC EVALUATION FOR PUBLIC GOODS AND SERVICES

Measuring the TEV means meeting the goal of obtaining an expression of individuals preferences about goods and services, which generally are not exchanged in markets (as compared to all the relative possible values in the corresponding economic taxonomy), trying to quantify the relation between wealth and utility, that subjects get from them. The most effective method of measuring the economic value of an asset/service, in terms of preferences of individuals involved in its market, is related to the identification of the Willingness to Pay (WTP) for a given quantity of goods/services, or the Willingness to Accept (WTA) a compensation for not being given it [15]. According to some authors [4, 5], there are four main methods for assessing users benefits and costs related to public goods, i.e., techniques depending on the concept of Hedonic Prices (HPM), the Travel Cost Method (TCM), the Contingent Valuation Method (CVM), and the benefit transfer method (BTM).

In addition, according to the literature (e.g. see 15), there are two main methods of monetary evaluation in the public field (as opposed to non-monetary methods, which include

quantitative and qualitative multicriteria techniques or descriptive statistics methodologies): on one side, there are methods that assess the value of a good/service using specific demand curves and the concept of consumer surplus (more interesting and consistent from the point of view of microeconomic theory; see 13), on the other side, we meet techniques that refer to actual markets and traditional estimation approaches [11]. The first category includes measures without a demand curve, which are based on the dose response approach, requiring the existence of datasets linking human, vegetal or animal physical reaction to pollution stress [15], but also the replacement cost technique, which considers the cost of replacing or restoring a damaged asset and uses this as a measure of the benefit of restoration [20], the behavior in terms of prevention expenditure, and the opportunity-cost approach, which does not directly measure environmental benefits, but estimates the benefits of the environment and ecosystems degradation from the point of view of activities that caused it [15].

In this sense, the evaluation methods using the concept of consumer surplus, referring to the division between actual and hypothetical reference markets, can be divided in two large groups of TEV estimation methods, i.e. direct and indirect approaches [4, 5]. The first category includes several techniques, such as Market Choices, Voting Choices, Opinion Polls and the Travel Costs Method, which are the result of observable behaviors. These methods have the advantage of relying on the measurement of real behaviors, but generally provide an assessment limited to the use values [4, 5]. In the second set of methods, there are several other successful techniques, such as the Protection Costs Method, the Compensation Costs Method, the Market Values Method, the Contingent Valuation Method (CVM) and procedures based on the concept of Hedonic Prices (HPM). In hypothetical contexts, the researcher tries to calculate how much the individual (or the community) would be willing to pay if a given public good or service is offered. The hypotheticality concerns, therefore, the preference of a good/service that is not available yet, being, then, uncertain in its market availability, and depending on the behavior of others, whose actual financing is postponed to a subsequent decision [15].

The basis of each of the abovementioned techniques is the hypothesis that it is possible to appraise market values for public goods and services, which may be perfectly the same as those which would be generated in the corresponding market with pure and perfect competition conditions for that good/service, although it is not possible to establish such a condition in practice [15]. Essentially, in speculative terms, these methods are practically interchangeable [4], although there are specific conditions under which it is advisable to apply each technical specification. In fact, according to any of the different approached available [5], the different evaluation methods can be divided into the two abovementioned main categories (direct and indirect systems). On one side, consumer behavior is estimated by directly asking for his or her likely conduct in relation to a hypothetical market [15], on the other side, this attitude is inferred in relation to other existing markets [4, 5], therefore, the first group applies an *ex-ante* approach, which is not defining use values for a given asset/service, but its option and existence values, the second

group is aimed at establishing the different use values through an *ex-post* approach that is based on the choices made by respondents [15].

Plus, there are two ways of dividing evaluation methods based on how they elicit preferences. The first one infers individual economic assessments directly from the statements of respondents, the second one indirectly deduces them from their behavior. Considering this principle, direct and indirect methods can be identified, also usually referred as stated and revealed preference methods [15].

Combining these two standards in the possible kinds of methods [4, 5], four different sets of approaches can be identified: direct methods in hypothetical environments (including most of the Contingent Valuation applications), indirect methods in real environments (such as TCM and HPM), direct methods in real environments (such as referendums and simulated markets), and indirect methods in hypothetical environments.

In conclusion, the economic interest in public goods and services is increasing and, in the actual conditions of unstable markets and lack of reliable data references, it seems reasonable that traditional and common methodologies, used in normal conditions, can be adapted to changing contexts in a period of instability. In a context that cannot ignore the economic importance of public good and services, it is often inevitable that the issue of evaluation methods should be expanded to include new comprehensive approaches [4, 5]. The complexity of non-use values cannot be explained without considering actual and possible uses, including the understanding of needs and preferences related to the reference community. All of these factors cannot be left to the solely market trends and tendencies, for, as we have seen in the previous paragraphs, the market is and always will be unable to include (totally, or partially) option and non-use values in its typical appreciation approaches.

REFERENCES

- [1] F. Della Puppa, "Dal valore economico al valore sociale", in La Rivista di Engramma, Issue 166, June 2019, ISBN 9788894840858.
- [2] A. Pandolfi, P. Campi, and L. Terlizzi, "GIS and landscape analysis," in PEOPLE: International Journal of Social Sciences, Special Issue Volume 3 Issue 1, pp. 629-643, DOI: <https://dx.doi.org/10.20319/pijss.2017.s31.629643>.
- [3] L. Gabrielli, I. Lami, and P. Lombardi, Il valore di mercato: note di lavoro per la stima di un immobile urbano, Torino, Celid, 2011, ISBN: 9788876618987.
- [4] S. Mattia, A. Oppio, and A. Pandolfi, "Testing the use of Contingent Valuation Method in Real Estate Market: first results of an experiment in the city of Milan", in Aestimium, August 2, 2013, pp. 721-734, DOI: <https://doi.org/10.13128/Aestimium-13174>.
- [5] S. Mattia, A. Oppio, and A. Pandolfi, "Contingent Valuation Method and Market Value: Applying Stated preference methods in Real Estate Market", in Proceedings of the 17th ERES Conference, June 2010. DOI: https://doi.org/10.15396/eres2010_083.
- [6] M. Bravi, and E. Fregonara, Promozione e sviluppo immobiliare - Analisi dei processi e tecniche di valutazione, Torino, Celid, 2004, ISBN: 9788876616136.
- [7] R. Capello, S. Cerisola, and G. Perucca, "Cultural Heritage, Creativity, and Local Development: A Scientific Research Program", in The regeneration of the built environment from a circular economy perspective, edited by S. Della Torre, S. Cattaneo, C. Lenzi, and A. Zanelli, Springer, pp. 11-20, ISBN: 9783030332563.
- [8] A. Amato, edited by, Modelli econometrici e problematiche valutative, Milano, Franco Angeli, 2006, ISBN: 978846475461.
- [9] A. Oppio, "Conflicting values in designing adaptive reuse for cultural heritage. A case study of social multicriteria evaluation", in Computational Science and Its Applications - ICCSA 2017, PT III, edited by G. Boruso, A. Cuzzocrea, B.O. Apduhan, A.M.A.C. Rocha, D. Taniar, S. Misra, O. Gervasi, C. M. Torre, E. Stankova, B. Murgante, Springer, 2020, ISBN: 9783319623979.
- [10] F. Salvo, M. Dell'Ovo, D. Tavano, and L. Sdino, "Valuation Approaches to Assess the Cultural Heritage", in New Metropolitan Perspectives. Knowledge Dynamics and Innovation-driven Policies Towards Urban and Regional Transition, Volume 2, Springer Nature, 2020, pp. 1746-1754, ISBN: 9783030482794.
- [11] G. Brusa, Metodo e prassi estimativa, Maggioli, Collana Politecnica, 2007, EAN 9788838741067.
- [12] A. Pandolfi, "The Importance of Including the Value of Soil in Metropolitan Planning Strategies", in International Journal of Engineering and Technical Research, issue 8, volume 12, pp. 664-669, DOI: <https://doi.org/10.17577/IJERTV8IS120359>.
- [13] A. Lughini, La valutazione immobiliare. Criteri e strumenti operativi per operare in Italia e all'estero, Milano, Etas libri, 2003, ISBN: 97884530597X.
- [14] M. Michieli, and G. B. Cipolotti, Trattato di estimo. Generale, immobiliare, agrario, forestale, ambientale, legale, Edagricole, Bologna, 2018, ISBN: 9788850655274.
- [15] D.W. Pearce, R.K. Turner, and I. Bateman, Environmental Economics: an Elementary Introduction, New York, Harvester Wheatsheaf, 1994, ISBN: 970745010830.
- [16] E. Jowsey, Real Estate concepts: a handbook, Routledge, 2015, ISBN: 9780415857420.
- [17] Bentivegna V., and Miccoli S., edited by, Valutazione Progettazione Urbanistica - Metodologia e applicazioni, Roma, DEI, 2011, ISBN: 9788849604016.
- [18] W. B. Brueggeman, and J. D. Fisher, Real Estate Finance & Investments, 14th edition, McGraw-Hill, New York NY, 2010, ISBN: 9780073377339.
- [19] G. Hawawini, and C. Viallet, Finance for Executives. Managing for Value Creation, 6th Edition, South-Western, 2019, ISBN: 9781473749245.
- [20] S. Mattia, A. Oppio, A. Pandolfi, and A. Poletti, "Modelling and Evaluating an Environmental Damage Scenario: Discussing an Assessment Model Predicted Through a Geographical Information System Procedure", in Chemical Engineering Transactions, Volume 28, pp. 241-246, DOI: <http://dx.doi.org/10.3303/CET1228041>.