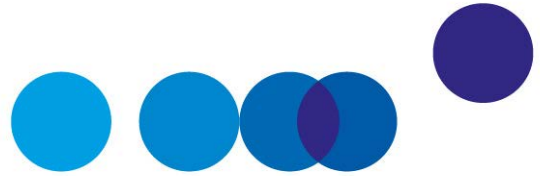


# GUIDE TO SOCIOECONOMIC EVALUATION OF PUBLIC INVESTMENTS IN FRANCE

Drafted under the authority of the Committee of Experts on Methods for Socioeconomic Evaluation of Public Investments, chaired by Roger Guesnerie, professor at the Collège de France and Honorary President of the Paris School of Economics





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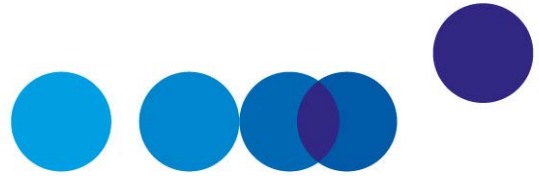


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## PREAMBLE

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### *Why assess the socioeconomic impact of public investments?*

Considering the amount of money at stake, the socioeconomic evaluation of public investments provides information necessary for public decision-makers. The aim of this evaluation is to assess and compare investment costs with the gains it generates for the well-being for the community. In France, as in other developed countries, public investments represent a significant portion of national investments, affecting a wide range of sectors including transport, energy, health, culture, education and justice. These public investments will shape the country for a long time, sometimes for centuries – its growth, the quality of its environment, its ability to face challenges. Since funding is largely derived from precious public resources, decisions about such investments are of high importance. Political decisions to invest must be guided by an objective evaluation of the social value they create for the community.

The Act of 31 December 2012 about Public Finance Planning makes it compulsory for project sponsors to carry out *ex-ante* socioeconomic evaluation of all public civil investments by the State and its public institutions, and for the most important among them, an independent counter-expert assessment.

#### **The compulsory nature of socioeconomic evaluation of public investments**

Performing *ex-ante* socioeconomic assessments of public investments is a legal obligation for public civil investment project sponsors. Article 17 of Act no.2012-1558 of 31 December 2012 imposes the obligation for *ex-ante* socioeconomic evaluation for civil investment projects funded by the State, its public institutions, public health institutions or health cooperation structures, including all sectors. The decree no.2013-1211 of 23 December 2013 specifies that this obligation concerns projects for which funding provided by the State and its public institutions exceeds 20 million euros.

For the largest projects – those for whose funding by the State and its public institutions exceeds 100 million euros – the General secretariat

for investment (GSFI) oversees an independent counter-expert assessment of the *ex-ante* socioeconomic evaluation carried out by the project sponsor. To coordinate this counter-expert assessment, the GSFI mandates a group of independent experts from one to four months; its composition varies depending on the projects in question. The experts concerned have proven professional experience and present sufficient guarantees of independence with respect to the project sponsor.

Moreover, since Act no.82-1153 of 30 December 1982 bearing on guidelines for internal transport, *ex-post* assessment is compulsory in the transport sector five years at the latest after infrastructures have been put into service, in particular for the largest-scale projects, i.e. those whose cost exceeds 83 million euros.

### ***Why draft a guide on socioeconomic evaluation of public investments?***

Socioeconomic evaluation embraces a great diversity of investments, and is based on calculation methods and conventions. Indeed, investments subject to socioeconomic evaluation cover many sectors (transport, energy, health, education, culture, justice, etc.), as well as situations (creation of a new infrastructure, development of new services, implementation of new technologies, modification, optimisation or modernisation of existing infrastructures, etc.). It is essential to use a cross-cutting guide with a presentation of methods and indicators to assess a project. While each sector has its own specificities, the methodology used in evaluation is rooted in certain common principles that this guide is designed to present.

Such a guide must be used to carry out *ex-post* assessments of investments several years after their completion. Technically, *ex-post* assessments are similar to *ex-ante* assessments, though the former measured historical data, not provisional data. Their main purpose is to determine the actual impacts of an investment once completed, to compare these effects to forecasts, and to analyse the differences between forecasts and achievements. *Ex-post* assessments are easier to perform when the *ex-ante* assessment has been properly carried out, documented and archived, and when these assessments have afforded a definition of indicators requiring collection of data throughout the project's lifespan. Apart from the transport sector, in which *ex-post* assessments are compulsory, generalisation to all sectors of such feedback practice, comparing an investment's actual results to its objectives, should be facilitated by the existence of a harmonised guide to socioeconomic evaluation.



### ***Who is this guide for?***

This operational guide is intended for departments in charge of projects within different ministries (transport, health, culture, justice, etc.), and public bodies, the State's public institutions, and health institutions. More generally, this guide is intended for any project sponsor wishing to evaluate the consequences of an investment to better optimise and assess its interest.

### ***What are the aims of this guide?***

This guide presents the guiding principles, concepts, and operational methods used by project sponsors to assess a project. In addition, it can be used to assess programmes composed of several relatively homogeneous and interdependent investment projects. And it enables project sponsors to apply a common analysis framework to all public investments. But it is not meant for the evaluation of more general public policies such as the effectiveness of a regulation, a tax provision, or any public expenditure.

The use of this guide does not require any previous knowledge of socioeconomic evaluation. A glossary of terms used in this guide can be found in Appendix 4<sup>1</sup>.

The principles laid out in this guide are intended to be durable. Hence, the purpose of this guide is not to discuss current or past methodological debates among experts. Rather, it is to summarize the principles of socioeconomic evaluation formulated by specialized commissions. Readers who wish to deepen their understanding may refer to the report on the socioeconomic evaluation of public investments published by France Stratégie under the supervision of Émile Quinet<sup>2</sup>.

The guide is accompanied by methodological supplements clarifying technical aspects common to all sectors. Regular updates will be provided by France Stratégie following validation by the Committee of Experts on Methods for Socioeconomic Evaluation of Public Investment<sup>3</sup>.

The adaptation of rules contained in this guide to methodologies pertinent to each sector is included in the sectorial methodological guides drafted by the ministries as economic

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<sup>1</sup> Supplements are published on the France Stratégie website [www.strategie.gouv.fr](http://www.strategie.gouv.fr) as and when they are drafted.

<sup>2</sup> *L'évaluation socioéconomique des investissements publics*, France Stratégie, report published under the supervision of Émile Quinet, 2013.

<sup>3</sup> This committee, set up in January 2017 by the GSFI and France Stratégie (see Appendix 3 "Missions and composition of the Committee of Experts"), specifies the socioeconomic calculation rules for each sector, based on the general methodology presented in this guide. To do this, the Committee of Experts guides discussions on the methodologies of socioeconomic evaluation and their sectorial application, in particular by setting up working groups involving figures from the academic world and stakeholders from the sector in question.

research itself progresses. Necessarily, the different consequences are taken into account and help to determine the evaluation process.

***Who are the authors of this guide?***

This guide was drafted under the authority of the Committee of Experts on Methods for Socioeconomic Evaluation of Public Investment, chaired by Roger Guesnerie, professor at the Collège de France and Honorary President of the Paris School of Economics. Prepared jointly by the Directorate-General of the Treasury and France Stratégie, its publication was shaped by consultation with different technical ministries, a process that improved the final indications by clarifying them and adapting them to user's needs. After this consultation, the guide was validated by the Committee on 10 October 2017.



## CHAPTER 1

# GENERAL APPROACH TO SOCIOECONOMIC EVALUATION OF PUBLIC INVESTMENTS

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Socioeconomic evaluation entails an assessment of an investment's benefits for the community by analysing costs and gains for the community. Its purpose is to understand, measure, and highlight all the anticipated consequences of an investment. These consequences cover a wide field, going beyond mere financial gain to include non-monetary impacts affecting the community's well-being such as the reduction of greenhouse gas emissions, reduction of traffic congestion, improvement of health, and so forth. Ultimately, its purpose is to determine whether on the possibility of investment the gains for the community are greater than the costs paid to achieve them. If this is indeed the case, the investment under consideration creates social wealth, and should, therefore, be made, providing there are no budgetary constraints; otherwise, it would lead to destruction of collective wealth, hence it is to be avoided. However, it should be kept in mind that any investment is a "gamble on the future." By definition, the result of any socioeconomic evaluation carries risks and is fraught with uncertainties to be assessed.

### 1. What is socioeconomic evaluation and what is its purpose?

The purpose of socioeconomic evaluation of public investments is to provide elements of analysis enabling:

- objectification of the impact of an investment on the welfare of all economic agents to assess its ability to meet an identified need, by assessing expected gains compared with the costs. Taking into account all such impacts, the main aim of socioeconomic evaluation is to provide an analysis enabling a decision to be made on the opportunity of carrying out a project;
- optimisation of investment costs conforming to stated aims and facilitating a discussion on the available technical and financial options. Socioeconomic evaluation enables comparison among investment options based on variables like different sizing, technical choices and financial arrangements, as well as different timetables. It may deal with

purely technical alternatives (renovation or reconstruction of a higher education or hospital building, different layout for a transport project, type of technology – for example, an automated metro or a bus, and so forth). And it may deal with funding options among them distribution of funding between taxpayers and users, and typical financial structures such as public works contracting, concessions or partnership agreements. Clearly, the purpose of socioeconomic evaluation is to compare these options to select those generating higher gains on welfare. It is essentially a framework to help optimize investments, and improve the efficiency of public expenditure.

- taking into account risks and uncertainties affecting an investment. Many risks are at play in socioeconomic evaluations of public investments. Such risks may relate to the evaluation method, itself, or to the values of the parameters used for its application ranging from uncertainties inherent in forecasts for underlying macroeconomic variables, to the project itself, those incorrect estimation of costs and timelines set by the project sponsor, or more, to the project's external environment – the simultaneous evolution of competition with completion of similar projects, evolution of the regulatory framework....
- provision of elements enabling a decision to be made between competing projects.

Socioeconomic evaluation is not a substitute for a political decision to invest. Rather its aim is underscore its relevance, elucidating the choices among several project options. Socioeconomic evaluation is not a tool that would restrict, or directly determine the political decision to invest or not. It should only provide elements of analysis about investment and allow for comparisons between several projects.

The clear presentation of the results of a socioeconomic evaluation is essential to public decision-makers' understanding of the effects such investment represents, real or potential. Such a written report is an indispensable prerequisite to prudent investment; this report must contain at least the data and models used as well as all elements of calculation.

## 2. How does socioeconomic evaluation differ from other existing analyses?

During appraisal of an investment project or programme, various analyses can be conducted: financial analysis, budgetary forecast, environmental evaluation, evaluation of the completion method, and multi-criteria analysis. Even though socioeconomic evaluation relies on data, together with some results from different studies, it is, itself, separate in a number of ways.

- **The financial analysis** is to measure and predict profitability of an investment for stakeholders, lenders, operators, constructors, among others, by comparing costs and benefits for each of them. Unlike financial evaluation, socioeconomic evaluation:
  - *takes account of the point of view of the community as a whole.* Whether French, European or international, the scope of investment must be justified by the project sponsor. Financial analysis can be conducted for the public or private stakeholder. It may, therefore, be a public authority (State, local authorities) as well as the operation's future

operator such as a hospital for a hospital property investment, the university community for a university property investment, the operator selected to operate a new transport infrastructure and so forth – those in a word expecting to derive a financial benefit directly or indirectly.

For a hospital renovation project – to use this example – enabling outpatient care (i.e. hospital admissions for less than a day not requiring overnight stays at the hospital), a financial analysis will only consider a conceivable reduction in patient care costs. The socioeconomic evaluation will also consider the social security costs as part of a patient's treatment including such factors as home-care nursing, and costs emanating from other treatment elsewhere. Moreover, these projected evaluations may include issues not strictly financial – indeed, factors touching upon collective welfare in the broadest sense.

- *is based on a wider range of influences than financial evaluations.* They include factors not purely financial or market-based which affect collective well-being (reduction of greenhouse gases, for example). If the public sphere decides to invest, it is precisely to benefit from factors on collective welfare in its broadest sense of the word, there are not taken into consideration in financial calculations;
- presents *other specificities* detailed in the methodological supplement. These often concern the discount rate (which is different to the financial discount rate, which must represent the cost of the financial resource), and the pricing system (financial profitability must be calculated in current currency, not in constant currency as is the case for socioeconomic analyses).

However, although financial analyses differ substantially from socioeconomic analyses, a financial analysis should complement all socioeconomic evaluations.<sup>1</sup>

- **The budgetary forecast** for an investment helps determine the cost of the investment, operating costs, depreciation expenses, financial costs and returns over the first few years of the investment's lifespan (generally for three, four or five years) for the ministry or public institution concerned.

Socioeconomic evaluation is different from this type of analysis:

- *It concerns the long, often very long term,* depending on investment lifespans – those over a century for transport infrastructures, or with very long-term objectives such as combatting climate change;
- *presents a “discounted” result.* it reports on the impacts occurring throughout the investment's lifespan at their “discounted” value by using a discount rate, whereas

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<sup>1</sup> See Chapter 4 “Financial analysis of investments”.

budgetary forecast exercises simply present the project's costs and returns on a yearly basis without discounting them (see Section 4.2 of Chapter 3 "Discount system").

- **The environmental evaluation** is to describe all possible environmental impacts of projects and all measures implemented to limit any potential environmental damage.

Socioeconomic evaluation is different:

- *does not only consider an investment's impacts* on the environment (whether relating to carbon dioxide emissions, noise pollution, air pollution, water pollution, soil pollution, etc.);
  - *aims to give monetary value to the various impacts* that have been quantified. Only impacts that have been monetised are included in the cost-benefit analysis; however, all other impacts must be presented in complement, qualitatively and whenever possible quantitatively;
  - *does not aim to describe with the same precision the measures considered* for avoiding, reducing, or compensating for impacts to the environment, their cost and monitoring arrangements, using the same detail as environmental evaluation; however, it does include estimates of resulting expenses and their potential related monetisable impacts.
- **Prior assessment of the completion method (PACM)** – public works contracting, concession or partnership agreement – is compulsory<sup>1</sup> before any decision to use a partnership agreement, whatever the amount of the investment.

Socioeconomic evaluation is different from this type of evaluation as the PACM:

- *only takes into account of the project sponsor's point of view*;
  - *compares completion methods of full cost and timelines*, but does not take account of the investment's externalities as socioeconomic evaluation does;
  - *does not pronounce on the opportunity to invest or on investment options* but only on the completion method to prioritise from a financial point of view (public works contracting, concession or partnership agreement).
- Lastly, **multi-criteria analysis** consists of listing criteria for analysis of an investment, allocating indicators to these criteria, and then – because the criteria search phase usually reveals a large number of criteria – partially aggregating them by assigning weight to them, to finally produce a limited number of "notes" corresponding to aggregated categories of criteria. This type of analysis poses significant risks of double-counting; it can be subjective and lack transparency.

Socioeconomic evaluation, based on cost-benefit analysis, is different from multi-criteria analysis in that it:

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<sup>1</sup> Articles 74 and 147 of Ordinance no 2015-899 of 23 July 2015 bearing on public procurement.

- *requires detailed analysis of all a project's foreseeable consequences, their uncertainties, and of their likely evolution;*
- *includes consequences that can be evaluated in terms of quantity and value, in a cost-benefit calculation, which takes account of the unknown factors specific to any forecast;*
- *indicates which consequences cannot be taken into account for socioeconomic calculations, in order to analyse them, evaluate them and make decision-makers and the public aware of them.*

### 3. During which stages of investment appraisal should socioeconomic evaluation occur?

Socioeconomic evaluation can only be performed when sufficient elements about a project's costs and benefits are available. It should only be completed when the investment project has reached a relatively advanced level.

- Socioeconomic evaluation cannot take place during preliminary studies of investments. The evaluation may immediately follow such studies to better define the investment's technical characteristics and provide a stabilised estimation of its costs (e.g. studies of estimated demand, studies of functional characteristics, etc.)
- Socioeconomic evaluation, however, should not be conducted too long after definition and appraisal of investments: its purpose is to shed light on the opportunities for an investment, and the choice between the various options considered. It must occur before final decisions are made about feasibility of an investment and before options have been selected.
- And it is necessary to analyse the national, territorial, European and international strategies affecting the project. A list the project's original aims and the outlines of the investment will then be formulated.
- Ultimately, socioeconomic evaluation, as presented in this guide, should be performed when the project's degree of maturity (estimation of costs, technical conception, estimation of demand, etc.) is sufficiently advanced to identify more fully several technical options (work plans, technology systems, etc.), and financial structuring options (arrangements for distribution of investment financing between users and taxpayers. When a public inquiry is carried out, enough progress has been made on the project for investment determinants to have been identified and socioeconomic evaluation to have been undertaken. If the investment is declared of public utility, compulsory where expropriation is necessary, the socioeconomic evaluation must be included in the public inquiry file.
- It is essential that the socioeconomic evaluation be prepared as far in advance as possible, even though the final result may only be known once the investment project is sufficiently advanced. Consideration is first given to a potential investment; its aims and costs must be established and its impacts – whether positive or negative – anticipated, according to



stakeholders and type of impact, even though such details may only be defined once the project has taken on a clear form.

Socioeconomic evaluations of public investments should be updated regularly: if ever a major exogenous event (economic crisis, for example) occurs, a change in technical conception by the project owner, or if changes affecting users' behaviour take place after the first evaluations (change in consumption habits, emergence of new competing offers, etc.)

In addition to *ex-ante* socioeconomic assessment, *ex-post* assessments of investments should also be carried out several years after their completion. *Ex-post assessment* should, therefore, enable lessons to be drawn from experiences (as much in terms of demand forecasts, for example, as in terms of evaluation of costs) and their wide dissemination should contribute to improving *ex-ante* socioeconomic assessments for future investments.

#### 4. The systematic stages of socioeconomic evaluation

There are systematic interdependent stages for an *ex-ante* socioeconomic assessment; these are briefly listed below and further detailed in later chapters of this guide.

The socioeconomic evaluation process can be summarised by the following stages<sup>1</sup>:

- determining the investment's context and macroeconomic framework, known as "reference scenario";
- secondly, presenting the baseline option<sup>2</sup>, also called "counterfactual situation", which is the situation which would prevail in the event that the investment under consideration is not carried out;
- presenting the various investment options, including stakeholders affected, technical options and typical financial structuring options;
- identifying all anticipated consequences of the investment throughout its lifetime, dividing them among the different categories of stakeholders;
- from the reference scenario, baseline option, and identification of the impacts of investment options, quantifying the impacts of the various investment options, or, when such impacts are not quantifiable, describe them qualitatively;

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<sup>1</sup> The approach can be schematically described by the seven "W"s: Why (what are the aims)? Who (who are the stakeholders)? What (what are the impacts)? When (on what date)? Where (where will the impact occur)? Which quantity (if measurable)? Which value (if quantifiable)?

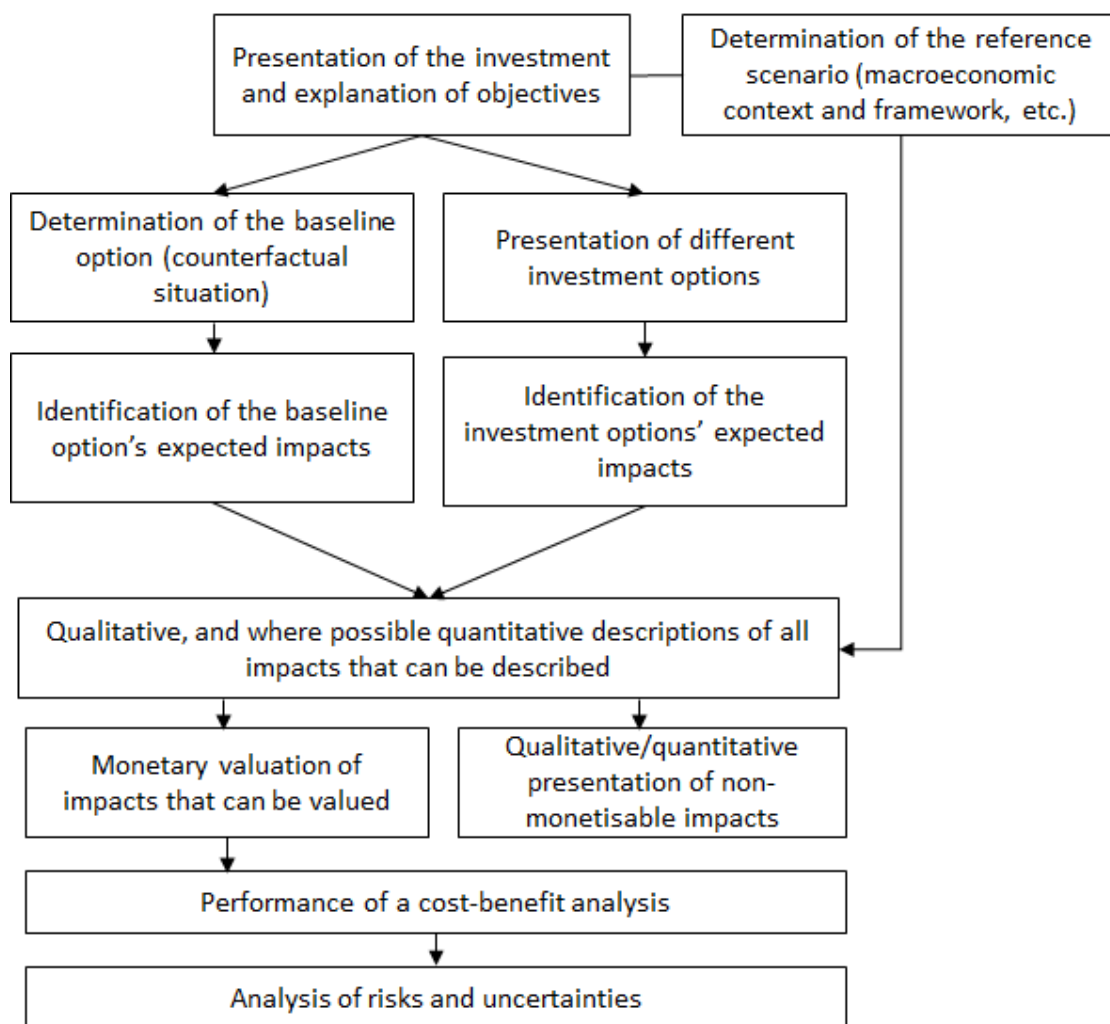
<sup>2</sup> Terms have evolved over time. The former commonly used notion "reference situation" is now divided into two parts: the "reference scenario", which refers to the general framework independent of completion of the investment, and the "baseline option", which refers to the situation that would prevail in the absence of the investment. The term "project scenario" has been replaced by "investment option".



- attributing monetary value to the investment’s quantified impacts by using correlative tables (“official social values”) (see Appendix 1 “List of methodological supplements”);
- from this, undertaking a cost-benefit analysis of the investment’s monetised impacts by examining the impacts whose valuation is based on the methodologies and guiding principles provided (see Appendix 1 “List of methodological supplements”);
- also presenting the investment’s non-monetised impacts by using the method recommended in the dedicated methodological supplement, including its potential territorial impacts;
- lastly, after carrying out a cost-benefit analysis, analysing the risks and uncertainties surrounding the elements of socioeconomic analysis.

Furthermore, a financial analysis should complement the socioeconomic analysis and presenting the investment’s financial interest to determine financial viability.

### The systematic stages of socioeconomic evaluation



The methodology used in conducting the various evaluation stages is detailed in the following chapters.



## CHAPTER 2

# GENERAL FRAMEWORK FOR SOCIOECONOMIC EVALUATION OF PUBLIC INVESTMENTS

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### 1. Presentation of the investment and explanation of its objectives

#### 1.1. Presentation of the project's objectives and strategic analysis

The first stage in socioeconomic evaluation is to provide a detailed picture of the initial aims for investment – responses to the structural issues that the investment seeks to resolve.

For example:

- observation of saturation of various access routes to a given place at specific times can lead to a desire for better traffic management, a change in toll rates, or an alternative access project;
- a lack of cultural offers within a territory can result in increasing the size of existing theatres, organising new shows in existing facilities, or suggesting a project for a new museum or theatre;
- the lack of healthcare offers within a region can prompt an increase in existing healthcare services, recourse to other establishments, or even a new hospital project.

An investment generally falls within larger national and/or local strategies. A full understanding of this wider context is essential to the success of an investment.

Examples of strategies to consider:

- national strategy for energy transition;
- national strategy for higher education;
- local strategy for innovation management;
- local urban development plans;
- regional transport infrastructure plans.

### ***1.2. Presentation of the current situation and identification of problems to solve***

The description of the current situation – the status of the territory affected by the public investment – is the foundation of the socioeconomic evaluation process. The description comprises an economic aspect (national and regional macroeconomic information and information relating to territorial economy), a social aspect (demography, socio-professional categories, age pyramid, employment and skills, information relating to the population's health, etc.) and an environmental aspect (air quality, groundwater status, etc.). The existing offer that the investment intends to complement (healthcare offer, cultural offer, access to a territory, etc.) is also described. It is also important to describe previous development trends and other investments already accepted, or the implementation decisions already taken.

### ***1.3. Presentation of the investment***

Socioeconomic evaluation goes on to provide a brief presentation of the projected investment – its location, the operations to be carried out, the technical and functional characteristics, general objectives (ensuring access to healthcare in rural territories, opening up a given territory, reducing congestion on certain strategic transport routes, etc.), and overall investment amounts and provisional work schedule.

## **2. Determination of the investment's macroeconomic framework (reference scenario)**

Socioeconomic evaluation is based on a general macroeconomic framework forecast for the duration of the investment, known as the "reference scenario". It covers the economic, social and environmental context of the investment. The economic context comprises hypotheses on evolutions of variables not controlled by the project sponsor and that may influence calculation of the investment's different impacts. Forecasts of demand for an infrastructure generally depend on the macroeconomic and demographic situation as well as on exogenous actions taken by public authorities or other economic stakeholders.

### **2.1. Identification of evaluation parameters**

Estimation of the investment's impacts is determined by using a range of indicators affecting a project's socioeconomic profitability. Among others, these indicators include demand forecasts<sup>1</sup> for which methods of determination are outlined in the sectorial guides.

### **2.2. Identification of contextual variables on which evaluation parameters depend**

The evolution of evaluation parameters depends on the macroeconomic context, beyond the project sponsor's control, on the local, even international level. The hypotheses about the evolution of macroeconomic parameters follow the rules presented in the methodological supplement, together with those for economic determinants and other contextual elements specific to each sector that comply with the recommendations presented in sectorial guides.

#### ***National macroeconomic determinants***

The values of and hypotheses about the development of the national macroeconomic context necessary for consideration are detailed in a specific methodological supplement to be used systematically, whatever of the sector in question<sup>2</sup>. Whether considering an investment to modernise a hospital or renovate a prison, the same national macroeconomic framework should be used. Macroeconomic determinants considered include the GDP growth rate, possible gains in labour productivity, growth rates of household final consumption, population growth, and foreseeable evolutions of the environmental situation.

#### ***Regional and international macroeconomic determinants***

Socioeconomic evaluations of investments with territorial dimensions should include an analysis covering an appropriate perimeter (local, regional, national or even international). For such investments, regional – or international – development trajectories around the geographical perimeter of the investment to be evaluated must be considered. It is important to adapt to the expected provenance of users of the future infrastructure and/or service: for a hospital or an urban transport infrastructure, the characteristics of the surrounding local population, and therefore the local macroeconomic context, must be analysed. Such is also the case for a primary school or local museum, whereas a university or world-class museum requires a much wider perimeter.

The rules of evolution are presented in the methodological supplement on the macroeconomic framework of the reference scenario, which includes provision of the methodology to follow to forecast the regional GDP. When these rules are not set out in the supplement, a specific

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<sup>1</sup> Traffic on a motorway, a museum's visitor rates, energy demand, healthcare demand regarding a clinic or hospital, etc.

<sup>2</sup> See Supplement A1 "Macroeconomic configuration of the reference scenario".

analysis must be carried out, drawing on past trends, using available statistics and analysing foreseeable evolutions.

***Economic determinants specific to each sector or investment***

Socioeconomic evaluation includes hypotheses on variables specific to each sector, or to the investment under consideration. In this respect, estimations should be based on past trends – using available statistical data – and recommendations set out in the sectorial guides referred to. Hypotheses on evolutions of sectorial variables not included in the sectorial guides should be backed up by details of the references, methodology applied and calculations made. Generally, this concerns all variables characterizing the evolution of demand within the sector: mobility demand in the transport sector, evolution of the workforce in the tertiary sector, evolution of the number of detainees related to criminal policies, hospital infrastructure visitor rates, etc.

***Other contextual elements specific to each sector or investment***

The reference scenario also presents local adaptations and developments of the projected investment : the creation of new business parks (which, for example, has an impact on use of local transport), densification of neighbourhoods (which, for example, has an impact on primary school capacity), or other public investments or amenities of the same sort – a project for alternative access to a given destination has an effect on the expected use of a new metro or train line; a major project to open a university has an effect on the attractiveness of another university in the region, and so forth. Here again, the recommendations contained in the sectorial guides should be consulted.

### **3. Presentation of the baseline option (counterfactual situation)**

Socioeconomic evaluation of an investment compares investment options with a baseline option – also called counterfactual situation – which represents the situation which should prevail if the investment does not occur.

The baseline option should correspond to the most likely scenario without the investment, calculated within the estimated timeline. The baseline option is not that in which absolutely nothing is done and in which the infrastructure deteriorates; it is an option that explains the *minimal* investments necessary to maintain the existing infrastructures' functions. It may include renewal and modernisation investments and low-cost investments for existing infrastructures or compulsory expenses for regulatory or safety reasons.

For example, if an investment concerns construction of a transport infrastructure to improving a saturation of the network (a new tramway line to decongest a saturated metro line), the performance of operations that partially improve the situation may prove necessary (work to modernise the saturated metro line to increase its use or the capacity of its trains) even without the investment project. Similarly, if an investment concerns the modernisation of a building (a school, university, hospital, prison, etc.), it is possible that, failing such investment, the establishment may be forced to provide a deteriorated service, or even shut down – for safety issues. The operating costs and major maintenance and repair expenses reach much higher than regular maintenance expenses.

The methodological supplements provide information and examples to define the baseline option correctly.

To determine the most likely situation, and justify the choice, all possible baseline options are to be reviewed, and described in the evaluation's final presentation. Even if several baseline options seem foreseeable, the project sponsor should only choose one, and explain as much as possible, the reason for his/her choice, even in light of other options compared with the baseline option.

Defining the baseline option must be done carefully, since it strongly affects the results of the investment's socioeconomic evaluation. All evolutions of the context from other investments already accepted or likely to occur, evolutions in demand or recurrent expenditure, investments (renewal investments, or necessary investments to meet standards or for safety reasons) considered as completed on the evaluation horizon, anticipated evolutions in regulations, etc., must be specified.

## 4. Presentation of investment options

The various investment options enabling achievement of objectives are also presented in the socioeconomic evaluation, with their technical characteristics and contractual and financial structure.

### 4.1. Technical options

- Specifying all the investment's technical and functional characteristics, investment records and anticipated recurrent expenditure:
  - the main investment (tangible and intangible infrastructure investments such as software, advertising, marketing and communication expenses), and additional investments and expenses involved in the realisation of the project.

Renewal investments and maintenance-servicing and operating expenses are regarded as additional investments or expenses, as is road construction, and the implementation of public transport to access a new clinic.

Investments already paid for are not included, only optional expenses are considered.

- investments and expenditures avoided by the investment options, operating investments and expenditures described in the baseline option but which are no longer necessary with the investment.

An example would be maintenance expenses for an infrastructure replaced by a new infrastructure.

- to present the program for implementation of the investment and to establish a clear timetable for its completion. For an investment made up of several phases, it is essential to evaluate the implementation development through the different phases.

#### ***4.2. Typical structure options for completion***

For every technical option identified for the project, different typical contractual and financial structures for the investment should be detailed, including:

- public works contracting, in which public administrations finance the construction and operation of the work;
- public works and/or services concession, in which the State transfers construction and/or operation of a work to a private operator, which finances it using its own funds or loans secured by the revenues or tolls it receives over a contractual period, after which the work and its operation revert to the State;
- partnership agreements, where a public administration delegates the construction, pre-financing and operation of a work to a private operator in return for payment of annual rent for the duration of the contract.

Each possible structure should be the subject of a separate investment option, and therefore, of a separate socioeconomic analysis.

Differences in completion patterns can be explained by distribution of the investment's financing between users and taxpayers, as well as costs, completion times, and the amount of public expenditure dedicated to investments. Such patterns can have a significant effect on a project's socioeconomic profitability as well as the distribution of the investment's costs and benefits among stakeholders, including users and taxpayers.

For example, high user charges can have an incidence on the infrastructure's volume of traffic.





## CHAPTER 3

# THE SOCIOECONOMIC EVALUATION PROCESS

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Socioeconomic evaluation is an analytic process with several separate stages. The first stage consists of identifying the impacts associated with completion of an investment and the categories of stakeholders. Socioeconomic evaluation then goes on to quantifying all quantifiable impacts. The next stage assigns an economic value to impacts which can be monetised by using official social values. Non-market impacts should be given monetary value by using the official social values provided in the dedicated methodological supplement. In the event of no reference value being provided, a study of the monetisation of such impacts may be carried out, but it must be the subject of a presentation separate from the initial socioeconomic analysis.

### 1. Inventory of the different impacts of investment options

As a first step, it is important to identify the stakeholders affected by the investment, in particular: *(i)* the public authority (the State, local authorities, European public institutions, etc.) that co-funds the investment and collects taxes and duties; *(ii)* companies concerned by the investment (in particular, the project company, the project owner, the infrastructure operator, competing companies, etc.); *(iii)* users; *(iv)* local inhabitants who do not use the project; *(v)* the national population; and lastly, *(vi)* where applicable, the international population. The different categories of stakeholders that may be taken into account for socioeconomic analysis are detailed in the dedicated methodological supplement.

As a second step, it is important to make a quantitative estimation of a demand for the investment. Such estimation is extremely important, since it is precisely this demand that the investment intends to satisfy and which will shape the investment, i.e. the infrastructure to build or services to implement. The demand estimation usually depends on the pricing system implemented, as well as on offers competing with the investment under consideration (for example: adjustment of the pricing policy or services provided by other operators), which are key factors in the evaluation.

On this basis, performing a socioeconomic evaluation requires a detailed list of all an investment's expected consequences to be made for each category of stakeholders

identified, and which distinguishes between market impacts, non-market impacts and externalities.

- *The market impacts* of an investment are financial flows that affect the various stakeholders, such as investment costs and operating costs and revenues.

One example of a market impact is a railway operator who observes an evolution in its revenues based on the prices in effect after making an investment.

- *Non-market impacts* of an investment are impacts that do not result in financial flows, such as effects on the environment or health. These impacts do not correspond to a monetary transaction, but still have value for the community. Situations in which impacts are not market-based are frequent – and are also one of the major reasons for intervention on the part of the public authorities.

Improvements in safety, health or education.

A project's direct non-market impacts concern stakeholders directly involved in the project, users in particular.

An example of such impacts would be time saved by users of a new motorway infrastructure.

- The notion of *external impact or externality* is different, for it concerns gains or costs produced by a stakeholder directly involved in the project for other stakeholders, in particular residents.

An example is motorway where traffic causes local sound pollution affecting residents and road congestion creating delays for all motorists.

Details about the differences between market impacts, non-market impacts and externalities are provided in a methodological supplement; information on impacts may be found according to sector in the sectorial guides.

For impacts that should be included in the evaluation, the purpose of socioeconomic analysis is to explain all impacts related to the services provided by the investment likely to increase or decrease collective well-being over a long time.

For a transport project, this could mean gains in time, comfort and safety, environmental effects and public health effects, and various externalities such as agglomeration externalities, etc.

The impacts under consideration must be analysed and quantified compared with the baseline option.

However, some impacts cannot be included in a cost-benefit analysis, particularly, the impacts expected from an investment in activity or employment:

- on the one hand, in the long-term, the accounting of potential jobs created by an investment entails double-counting with attention to the abovementioned impacts;
- on the other hand, in the short-term, job creation opportunities belong more to analysis of macroeconomic policies about opportunities to increase public investment in the short term, all the more so since it is difficult to differentiate the employment content of a given investment compared with another.

Hence, impacts related to employment content of the worksite and its operation, as well as employment, affecting the rest of the economy because of the increase in activity generated, should not be included<sup>1</sup>.

## 2. Objectification of non-market impacts: qualitative and quantitative analysis

Once all the different non-market impacts of the investment options have been listed, the evaluation must provide quantitative assessments of these effects, compared with the baseline option, supported by specific studies and surveys. Here quantified indicators are used.

For environmental externalities, investments can result in a decrease in the number of tons of pollutants emitted each year, the number of tons of CO<sub>2</sub> emitted each year, noise levels emitted, or number of hectares of “artificialized” land.

For health externalities, investments can contribute to an increase in the number of diseases cured or in life expectancy.

Not all impacts can be easily measured and quantified; impacts resistant to quantitative evaluation should be detailed qualitatively.

The most appropriate indicators and the recommended approach to qualitative description of non-quantifiable impacts of investments are provided in the methodological supplements and sectorial guides.

<sup>1</sup> In economic theory, this is called multiplier and accelerator effects.

### 3. Monetary valuation of investment impacts

Monetisation of an investment's costs and benefits serves to express the investment in terms of monetary value (euros) and to facilitate their comparison.

#### 3.1. Monetisation of market impacts

Market prices are an initial reference for valuation of investments' market costs and benefits. An investment's market costs – construction costs, maintenance costs, servicing costs and operating costs – and market benefits – notably, revenue from users and sale of real estate or infrastructures – used in socioeconomic evaluation are usually based on prices observed and their foreseeable evolution, without inflation. Prices of goods excluding VAT and subsidies must be part of the socioeconomic evaluation<sup>1</sup>. The different expected subsidies together with variations in taxes and duties incurred for the State for the investment should also be included, and the opportunity cost of public funds should be applied to the algebraic sum of financial flows to and from the State<sup>2</sup> for every euro of public expenditure and revenue in the overall socioeconomic evaluation.

There are situations in which the market price does not reflect the socioeconomic value of the observed transaction, and should therefore not be used as it is. For example, if a market is subject to significant taxes or subsidies, market prices do not reflect the actual value for the community and adjustments are therefore necessary.

Hence, if a producer receives aid, in farming for approximately 40% of the price of his/her product, such aid should be added to the price of the product to obtain the actual production cost; in other words, the socioeconomic value of the good to be used in the cost-benefit analysis.

Similarly, if a sector is subject to administered prices – for instance, the health sector – observed prices need to be adjusted to reflect the actual socioeconomic value of the goods.

The methodological supplement on valuing market impacts details how direct market impacts should be evaluated.

<sup>1</sup> In theory, in order to know the actual cost of production, the price of all taxes paid by the company marketing the product should be deducted and all public subsidies added.

<sup>2</sup> See Section 4.3 of Chapter 3 and the methodological supplement dedicated to the opportunity cost of public funds.

### 3.2. Monetisation of non-market impacts

For non-market impacts, socioeconomic evaluation uses official social values corresponding to a fictitious price enabling valuation of such impacts. Official social values are presented in a methodological guide.

Examples of official social values include time saving, decrease in greenhouse gas emissions and, health improvement. They do not lead to financial flows with any observable prices.

A few examples of guideline values from the Quinet report (2013)

Impact category	Impact	Official social values in 2010 in €2010 <sup>1</sup>
Time	Transport times in Ile-de-France for professional reasons	€22.3 <sub>2010</sub> per person and per hour
Environment	CO <sub>2</sub> emissions	€32 <sub>2010</sub> per ton of CO <sub>2</sub>
Environment due to transport	Atmospheric pollution due to combustion and wear of a private diesel vehicle in densely populated urban areas (over 4,500 inhabitants per sq. km.)	€13.8 <sub>2010</sub> /100 vehicles.km

#### A specific example of an official social value: the value of time

The value of time is a fundamental index for the socioeconomic evaluation of investments in the transport sector.

Time values reflect the willingness of individuals to pay to save time on transport. They originate from a review of the literature, traffic models and mobility studies. They have been tested by recent economic behavioural studies in France and abroad, revealing preference studies in particular.

Values differ depending on modes of transport, and reasons for traveling. The hierarchy of reference-time values according to the mode of transport expressed above affect the types of users of different modes of transport. Hence, for a distance and reason for travelling, the superiority of time values in air transport compared with other modes of transport reveals that aircraft users are prepared to pay more to travel faster than other travellers.

Non-market impacts whose valuation requires use of values not presented in the methodological supplement or in the sectorial guides should not be included in the initial cost-

benefit analysis but rather presented separately. An attempt to monetise such impacts can be made by the project sponsor, using his/her own research and studies. But this must be the subject of an analysis distinct from the analysis based on official social values listed in the methodological supplement.

## 4. Cost-benefit analysis of the investment's monetised impacts

### 4.1. Calculation principles for cost-benefit analysis

Cost-benefit analysis is a comparison of future flows of gains generated by the project with future flows of costs. All listed and monetised costs and benefits and provides, through calculation of normalised socioeconomic indicators, a quantitative estimation of the aggregated impact of the investment on collective well-being, broken down by stakeholder and impact. Even though its results are restricted to monetised impacts alone, cost-benefit analysis permits objective and quantified comparisons between various investment projects within the same impact perimeter.

A few fundamental principles governing cost-benefit analysis:

- cost-benefit analysis compared with the baseline option. Socioeconomic evaluation results from comparison of two records of monetary or monetised flows for each of the investment's impacts, calculated by comparison between the investment option and the baseline option. Socioeconomic evaluation is a differential calculation that does not aim to estimate the value of an investment itself, but rather to assess what this investment yields compared with the baseline option.
- it must be conducted by impacts expressed in terms of real value – adjusted for inflation, and therefore in constant euros set for a given year known as the reference year, in opposition to their current value. Studying the evolution of impacts measured in monetary value is problematic if their value fluctuates with prices, for it is then impossible to determine whether such evolution is caused by a quantity impact, the investment's real impacts – or a price impact. Removing the price impact ensures that the true origin of the evaluated impacts is the quantity impact produced by the investment. Generally, the indexes (GDP price index, consumer price index, public works index, etc.) in the methodological supplement should be used.

### 4.2. Discount system, date and evaluation horizon, and residual value

Discounting is a technique used to compare costs and benefits occurring in different years. One characteristic of investments is that they have costs and benefits spread over time: schematically, an investment is expensive in the beginning because of its construction, but later yields returns over the course of its lifetime, during which expenses will need to be paid to operate, maintain, and renew the work. It is, therefore, necessary to compare benefits and costs in different time periods. Yet individuals prefer to benefit from goods and services

immediately rather than in the future: a euro earned tomorrow is worth less than a euro earned today.

The discount rate allows for all euros spent or earned over different years to be compared to the same year. Socioeconomic calculation requires the discount rate to be determined in advance to discount all flows to the same date<sup>1</sup> whatever the discount rate provided in the dedicated methodological supplement.

### The notion of discount rate

The discount rate enables all financial flows in different years to be compared to the same year, and to arbitrate between present and future: a high rate gives little weight to the future, while a low rate means greater concern for future generations. Choosing the discount rate is especially important as one of the characteristics of public investments is their long lifespan, with a high construction costs in the first years and benefits spread across the investment's life, which can last a hundred years, and sometimes even more.

In this context, the discount rate plays a key role in socioeconomic analysis, and thus on the evaluation of an opportunity to invest. For example, a benefit that has a monetary value of €1 in 50 years justifies spending €0.37 today if the discount rate is 2%, but only €0.09 if the discount rate is 5%!

Over what timeframe should socioeconomic evaluation be conducted? For large investments, the analysis horizon should be closer to the technical or economic lifespan of the investments considered in the project options or represented in the baseline option. Large infrastructures are commissioned for periods of tens of years, and even for some sectors in hundreds of years. Sectorial guides indicate the appropriate life cycles and timeframes for investments in each sector.

Lastly, the investment's residual value must be determined at the end of the chosen period for evaluation (above mentioned time horizon), which represents the impacts that can be expected from the investment beyond the selected analysis horizon. An investment's residual value is the value of its assets for the community at the end of the socioeconomic evaluation forecast period, and includes, specifically, potential deconstruction and dismantlement costs. The methodological supplement dedicated to the discount system details methods for calculating residual value.

<sup>1</sup> The discount year is set at 2015 by the Committee of Experts on Methods for Socioeconomic Evaluation of Public Investment for socioeconomic evaluations carried out between 2017 and 2022.



### ***4.3. Consideration of the specificities of recourse to public funds***

Public investments depend in part or in whole on public funds, which, as they sooner or later involve equivalent increases in compulsory contributions, have a cost to be considered in socioeconomic evaluations. While public expenditure is initially funded by government borrowing, the increase in taxation is simply deferred until later: it does not occur when the project is launched, but during the following periods to reimburse the debt.

Any increase in taxation is in itself a source of distortion in the market economy. Public levies serving to finance public policies particularly public goods and subsidies introduce gaps in the sphere of market goods, and services between prices paid by consumers and prices collected by producers, who change consumption and production choices, so distancing consumers' choices from the socioeconomic optimum. A euro levied on the taxpayer to fund a public good costs more for the community than a euro spent by the same taxpayer to purchase a private good. Such market ineffectiveness of the taxation system as a whole is referred to as the "opportunity cost of public funds" (OCPF).

To take into account the market distortion caused by the necessary compulsory contributions accompanying any public fund expenditure or revenue in the socioeconomic calculation, the net additional public expenditure generated by making the investment, across the project's entire lifespan, must be multiplied by the OCPF, the recommended value of which is provided in the dedicated methodological supplement. This rule applies both to French public funding, whether originating from the State or from regional and local authorities, and to European public funding.

### ***4.4. Calculating socioeconomic indicators***

For an investment, the socioeconomic net present value (SE-NPV) is the main socioeconomic evaluation indicator.

#### ***Defining the SE-NPV***

The SE-NPV is defined as the sum of present monetised benefits minus the sum of present monetised costs, with benefits and costs calculated by subtraction with the baseline option, as specified above. It is the social value in constant euros created by the investment.

#### ***Presenting the SE-NPV***

It is necessary to present the breakdown of an investment's SE-NPV by types of impact of which it is composed. This is all the more important that, insofar as not all an investment's impacts can be expressed in monetary value, it enables specification of investment impacts that are not considered in calculation of the SE-NPV. As a second step, a report on benefits and costs can be provided for certain categories of stakeholders.

Depending on the categories of stakeholders – companies, local and regional authorities, consumers, users and other members of the public affected by the investment – it may be



appropriate to present several “territorialised” SE-NPVs. In particular, with an investment that generates costs or benefits outside France, both the SE-NPV for France (net of a potential European subsidy) and the SE-NPV for Europe or the world should be provided.

#### *Formula for calculating the SE-NPV*

The SE-NPV should be calculated in accordance with the year in which the investment is planned to be put into service. With  $B_i$  benefits and  $C_i$  costs of year  $i$  (both in constant euros, by differential in relation to the baseline option, public expenditure allocated to the OCPF) including initial investments,  $r$  the discount rate,  $N$  the year in which the evaluation started,  $RV$  the residual value of the investment and  $D$  the evaluation period excluding the period taken into account for the residual value, the SE-NPV is expressed by the following formula<sup>1</sup>:

$$\text{SE-NPV} = \sum_{i=N}^{i=N+D} \frac{B_i - C_i}{(1+r)^i} + \frac{RV}{(1+r)^{N+D+1}}$$

Consider a fictitious project to renovate a hospital in 3 years. The project in question costs €41.7M in works lasting one year and the entire investment cost is funded by public subsidies; it is necessary to assign these OCPF expenses, which we will assume are equal to 1.2: the initial cost to be taken into account for the socioeconomic calculation of the third year is  $41.7 \times 1.2 = \text{€}50\text{M}$  discounted, i.e.  $50 / (1 + 4.5\%)^3 = \text{€}43.9\text{M}$ .

From the fourth year, the project generates socioeconomic gains and costs of €35M and €10M respectively per year for ten years, which do not involve public funds<sup>2</sup>.

If the baseline option, relating to the maintenance of one of the hospital's deteriorated services via recurrent maintenance expenses, involves costs of €5M per year. Compared with the baseline option, the project here considered generates benefits and costs of €35M and €5M respectively per year for ten years. In the absence of socioeconomic gains and costs after this period, and of residual value, and with a discount rate of 4.5%, the socioeconomic net present value of the investment is equal to approximately €164M. This value is calculated as follows:

$$\text{SE-NPV} = \frac{-50}{(1+4,5)^3} + \sum_{i=4}^{13} \frac{35-5}{(1+4,5)^i} = 164.2$$

<sup>1</sup> This formula assumes that the discount year is the year in which works begin. In reality, the SE-NPV must be calculated in constant euros in comparison with a discount year common to all future investments. By way of example, the discount year is 2015 if socioeconomic evaluations are carried out between 2017 and 2022.

<sup>2</sup> In other words, maintenance costs, for example, are here considered to not involve public funds; if they do, the OCPF should be applied to them.

*The aim: to analyse the socioeconomic profitability of the various options and compare them*

Calculating the SE-NPV enables estimation of the socioeconomic profitability of investment options, i.e. estimation of the collective value they create. An investment is desirable from the community's point of view if it creates collective value; in other words, if its SE-NPV is positive, that is if total gains generated exceed the costs incurred. The corresponding methodological supplement demonstrates how the principle of NPV maximisation makes it possible to answer the different questions asked by the decision-maker.

**4.5. Disaggregation of socioeconomic indicators by stakeholder and territory**

The SE-NPV should be broken down by stakeholder and territory whenever appropriate. In some cases, even when an investment's SE-NPV is positive, it can produce heterogeneous impacts according to categories of stakeholder affected and territories:

- assessment by stakeholder reveals the impact of transfers between stakeholder, highlights potential acceptability issues and identifies accompanying measures necessary to the project. Fine disaggregation clarifies the respective proportions of monetary and external impacts and highlights redistributive impacts.
- wherever relevant, assessment by territory highlights the investment's different effects on each territory concerned. The investment's monetised costs and benefits making up the SE-NPV are broken down by territory: local, regional, national and international level. In particular, with an investment involving costs or benefits outside France, it is necessary, as far as possible, to distinguish between the SE-NPV for France and the overall collective SE-NPV.

Socioeconomic evaluation simply breaks down the socioeconomic result among stakeholders affected by the investment, as stated in Section 1 of Chapter 3. However, results by stakeholder and territory should be interpreted with care, as long-term dissemination of the investment's impacts in the economy changes how they are distributed among stakeholders (final redistribution occurs between households) and territories. The time travellers save by a new transport infrastructure's entry into service may be expressed, over the long-term, in changes in the price of land and therefore also ultimately benefit land owners.

**5. Analysing the risks and uncertainties surrounding the results of socioeconomic evaluations**

Socioeconomic evaluation of investments must consider the many risks and uncertainties surrounding for construction costs, demand, economic context, energy costs, operating and running costs. Risks and uncertainties are unknown factors relating to the valuation of NPV components; more specifically, risk is an unknown factor that can be quantified probabilistically whereas uncertainty is an unknown factor that cannot be quantified probabilistically. Socioeconomic evaluation must take account of all risks likely to impact a

project's socioeconomic result, including environmental and health risks. Analysis of risks and uncertainties is fundamental to socioeconomic evaluation of investments, in particular in order to test the vulnerability of creation of collective value, enabled by the investment options, to the identified risks and uncertainties.

There are two types of risks and uncertainties that weigh on the socioeconomic evaluation of public investments.

- *Firstly, risks that are specific to the investment.* These are risks that are independent of macroeconomic growth and which can be divided into two categories:
  - risks that can – at least partially – be controlled by the project sponsor and which may result from errors in time and cost estimations (construction, maintenance, operation, environment and health protection, etc., which are generally underestimated) or from the operator's future pricing practices. The analysis must foresee measures that could be implemented to reduce such risks;
  - risks related to the evaluation of estimation of SE-NPV components; these can result from the use of insufficiently reliable data (poor data quality), insufficiencies and imperfections in the demand “model”, or the difficulty of foreseeing behavioural evolutions, changes in regulations or pricing rules, the emergence of new competition, obsolescence of technologies, etc.
- *Secondly, risks not specific to the investment* under consideration, related to uncertainties regarding the main macroeconomic determinants likely to affect gains generated by the investment: evolution of energy prices, the GDP, land prices, employment growth, numbers of housing units, etc.

Such risks are always quantified as part of socioeconomic evaluations; to do this, it is necessary to refer to the advice provided in the dedicated methodological supplement.

A “risk matrix” – including a detailed description of identified risks, measures taken to reduce such risks and an estimation of related costs – should be systematically provided and sensitivity tests carried out on socioeconomic indicators and commented on for each of the project's key variables.

## 6. Taking account of investments' non-monetary impacts

Presentation of the SE-NPV can be complemented by including qualitatively, and where possible quantitatively, any potential impacts not monetised. The aim is to measure the impact of different investment options on aspects that could not be included in the socioeconomic calculation: the territorial impacts of investments (redistributive aspects, improvement of access to care, etc.) Analysis of the non-monetised impacts not included in the cost-benefit calculation should be included in the presentation of the evaluation's results, in compliance with the recommendations made in the sectorial guides.

The final presentation must include a summary of the cost-benefit analysis' results (i.e. the NPV and its breakdown by type of impact) complemented by the (qualitative, and where possible, quantitative) impacts that are not monetisable.

The table, below, offers an example of representation of the socioeconomic profitability of a project to extend a metro line, with a SE-NPV of €2.75b, incorporating:

- quantified and monetised impacts included in calculation of the NPV and their effect on the NPV;
- quantified but non-monetised impacts;
- impacts that can only be described qualitatively.

<b>All investment impacts</b>	<b>Monetised impacts</b> <i>Included in calculation of NPV</i> Share in NPV (in €M)	<b>Quantified impacts</b> <i>not included in calculation of NPV</i>	<b>Qualitative impacts</b> <i>not included in calculation of NPV</i>
Initial investment	- 1,000	-	-
Exploitation/maintenance	- 300	-	-
Transport time	2,000	-	-
Regularity	1,500	-	-
Climate	300	-	-
Air quality	250	-	-
Jobs/productivity (Competitiveness)	-	+ 3,000 jobs a year	10% of jobs relocated to conurbation centre (concentration)
Biodiversity	-	450 hectares artificialized, including 110 hectares in protected wetlands	Destruction or displacement of protected species
Quality of life	-	Indirect urban development: + 1,000 housing units a year and new offices built	-



## CHAPTER 4

# FINANCIAL ANALYSIS OF INVESTMENTS

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### 1. Principles of financial analysis

Socioeconomic analysis of investments should be completed by financial analysis. Such analysis can be established from the point of view of any entity, public or private, which invests in or subsidises the project and which, without necessarily taking part in its operation, expects a direct or indirect financial return from its participation.

Financial analysis presents the investment's financial result (and therefore the financial profitability) for the delegate or operator. In other words, financial analysis of the investment, when appropriate – that is, when the investment is likely to yield commercial revenues – enables assessment of its financial feasibility and profitability as well as the level of financial risk involved. It also enables estimation of public contributions that might be required to carry out the investment.

Financial analysis must be carried out in accordance with principles differing from those governing socioeconomic analysis, and which are detailed in the dedicated methodological supplement. In particular, these concern the range of impacts to be evaluated, and therefore the point of view to adopt (public authority or operator rather than the community as a whole), the discount rate to be used (different from the socioeconomic discount rate), which should represent the cost of the financial resource specific to the project, including dividends, for the entity from whose point of view the investment is carried out, or the pricing system (financial profitability must be calculated in current currency and not in constant currency as is the case with socioeconomic analysis).

However, like socioeconomic evaluation, it should still lead to the presentation of a number of normalised indicators, including a financial NPV, and the profitability of capital used, or the financial payback period (also known as the recovery period). The financial NPV is the sum of discounted cash flows, such as the difference between discounted benefits and costs of any kind generated by the operation for the operator. Details of calculation of such indicators are provided in the methodological guide. Lastly, with socioeconomic analysis, a financial risk analysis should be carried out to assess the operator's financial fragility – his/her ability to withstand changes to his/her environment or unfulfilled forecasts.

## 2 The purpose of financial analysis

the combination of the results of socioeconomic analysis and financial analysis of the investment for the operator – revealing socioeconomic profitability potentially different from financial profitability – sheds light on its interest for the community, its feasibility and the potential necessity for improvements.

- **If both NPVs are of the same sign:** in the event of both NPVs being negative, it is recommended to abandon the investment; if both being positive, the investment is of interest to the community. In this latter case, one should seek to optimise the investment in relation to the objectives assigned to it.
- **If the SE-NPV is positive and the financial NPV is negative:** the investment is desirable for the community, but may put the operator in financial difficulty.

Such a situation can either derive from an investment that is a strong source of non-market value for the community, but creates little market value (therefore creating a potentially negative financial value, in whatever case inferior to the socioeconomic value created), or from the financial evaluation based on market prices (the market price of carbon emissions, for example, which is currently low) that do not reflect the usefulness of the impacts generated by the investment (the social value of carbon, for example, which is much higher).

A reduction in costs with stable benefits, the search for new funding (an investment may be collectively desirable but not very profitable from a private point of view for lack of subsidies, thereby justifying government intervention), or an evolution in prices applied to users can be studied to make the investment financially profitable. Once this analysis is finished, it is possible to determine the minimum sum that the State should grant the delegate or operator for its financial NPV to be positive to ensure its minimal profitability.

- **If the SE-NPV is negative and the financial NPV is positive:** although the investment is viable financially, its completion is of no value to the community; it should be reworked to improve the socioeconomic benefits it is likely to generate, or be abandoned.



## CHAPTER 5

# EX-POST SOCIOECONOMIC ASSESSMENT

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An *ex-post* socioeconomic analysis should be conducted several years after an investment has been made. *Ex-post* assessment is similar to *ex-ante* assessment. They are both carried out in the same way and according to similar processes. Among other things, they must both identify and measure an investment's market and non-market impacts. *Ex-post* analysis uses observed historical data rather than provisional data.

However, *ex-post* assessments have their own specificities, including the assessment of the different events, quantified wherever possible; a comparison with the target outcome – *ex-post* assessment should estimate whether the investment has achieved its objectives and, if not, if the results differ from the forecasts made by the *ex-ante* assessment, the *ex-post* assessment should try to establish why; a comparison of results with the absence of investment (*ex-post* baseline option) – just as *ex-ante* assessments make a comparison between options and absence of intervention (*ex-ante* baseline option) – and with one or more other possibilities considered *ex-ante* (other investment options identified *ex ante*). Lastly, the *ex-post* assessment's results and recommendations should prove helpful to future decision-making with lessons for formulating recommendations about *ex-ante* assessments in the future.

*Ex-post* assessment must also try to identify investment impacts that were not identified or were wrongly assessed during the conception stage: identification and quantification of such impacts (major congestion of a transport infrastructure reducing individual benefits, growth evolution different from that initially foreseen, impact on the environment, emergence of unforeseen competition, unanticipated evolutions in pricing, evolution of regulations, etc.) may form the subject of specific studies.

Efforts must be made to publicize the results of *ex-post* assessments. Indeed, it may be useful to publish a summary of the main points highlighted during the assessment, with a summary of the results of several assessments including common characteristics. The assessment reports and studies on which *ex-post* assessments are based should also be made public, except for valid security or confidentiality restrictions.

Proper storing of data by project sponsors is essential for the performance of *ex-post* assessments. To draw as much useful information from *ex-post* assessments as possible, it is vital to maintain an extensive repository of data on the risks and uncertainties of *ex-ante* assessments by documenting from the very beginning of an investment project, the project owner's detailed reports, software and study files, as well as those produced by teams tasked with carrying out the studies. The monitoring, collection and storing of data throughout the investment's life is essential to provide material for *ex-post* assessment.





## CHAPTER 6

# PRESENTATION OF RESULTS

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A summary of data, methods, and results of the *ex-ante* socioeconomic assessment is presented by the project sponsor, so that stakeholders and decision-makers can appropriate them.

The assessment summary summarizes the socioeconomic evaluation's key points highlighted in this guide, and includes at least the following information:

- the objectives assigned to the investment;
- a description of the investment under consideration;
- a description of the macroeconomic hypotheses used in reference scenarios;
- a description of the baseline option and its justification;
- a description of the various investment options, including technical options and typical financial structuring options; evaluation of the cost of construction and subsequent maintenance and renewal expenses, accompanied where possible by a comparison with the costs observed for investments of a similar nature;
- evaluation of “traditional” discounted benefits and their breakdown in surplus of users, effects on operator's revenues; effects on the environment and other effects;
- the socioeconomic net present value broken down by impact and category of stakeholders, as well as other relevant indicators;
- presentation of the results of analyses of uncertainties and risks related to the assessment, including variants on the underlying hypotheses used;
- a separate qualitative – and if possible quantitative – reasoned description of non-monetised impacts, such as a decrease in market powers, impacts of spatial distribution, redistributive consequences of the investment, etc.;
- the main results of financial analysis of the investment.





## CONCLUSION

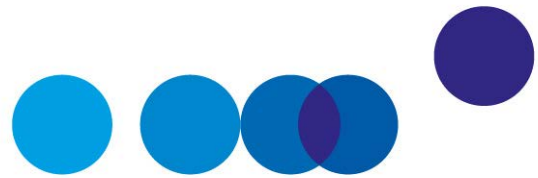
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Socioeconomic evaluation of a public investment helps to analyse its value for the community, and to improve the investment by further analysing its various components and the risks inherent to its completion. To ensure coherence, and comparability of the different investment options, socioeconomic evaluation must comply with rules laid down in this guide, its methodological supplements, and sectorial guides.

The principles governing such evaluation are detailed in this guide. The costs of carrying out the investment should be compared with the benefits – and potential losses – it generates. To do this,

- socioeconomic evaluation lists the stakeholders involved and the nature of the project's impacts on each of them;
- once such impacts have been identified, they should be quantified as far as possible, particularly by studying the demand for the investment in question;
- these impacts should then be valued in monetary terms; however, such monetisation is handled differently depending on whether there are market impacts, or such non-market impacts as externalities;
- lastly, to calculate objective appraisal criteria, and in particular, the socioeconomic net present value of the investment, the benefits and costs present at different periods need to be combined, and must be brought back to their “discounted” value by using the discounting calculation;
- in addition, impacts that could not be monetised form the subject of a separate presentation. The data used and the main stages of calculation must be presented accurately and in detail in order to ensure that decision-makers and the public understand the evaluation's different stages and final results.





## Appendix 1

# List of methodological supplements

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The list of methodological supplements to this guide is provided below for informational purposes only. Up-to-date supplements are published on [www.strategie.gouv.fr](http://www.strategie.gouv.fr), the France Stratégie website.

- Macroeconomic configuration of the reference scenario
- Definition of the baseline option
- Stakeholders to consider in socioeconomic evaluation
- Market and non-market goods
- Valuation of market impacts
- Valuation of non-market impacts
- Official social values
- Construction of demand functions and calculation of surpluses
- Opportunity cost of public funds
- Discount rate
- Residual value
- Socioeconomic indicators and choice of projects
- Optimal date for putting an investment into service
- Risk analysis
- Consideration of non-monetisable impacts
- Financial analysis
- Socioeconomic evaluation of modernisation and renewal projects





## Appendix 2

# Engagement letter to Roger Guesnerie



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RÉPUBLIQUE FRANÇAISE

PREMIER MINISTRE



**Le Commissaire général**



**Le Commissaire général à l'investissement**

Paris, le 6 octobre 2016

Monsieur le Professeur,

Lorsque nous vous avons sollicité pour présider un comité d'experts sur les méthodes d'évaluation socio-économique, vous avez demandé un temps de réflexion, mais accepté dans un premier temps de présider les colloques co-organisés par France Stratégie, le CGEDD et le CGI pour vulgariser les avancées en matière de calcul socio-économique. Vous avez assuré cette présidence avec brio à quatre reprises et nous vous en remercions chaleureusement.

En donnant toute sa place à l'évaluation socio-économique dans sa politique d'investissement, l'Etat a engagé une réforme significative pour innover dans l'optimisation de la gestion publique. Les rapports des contre-expertises pilotées par le CGI sur plus de 40 projets d'investissements publics montrent à quel point il est nécessaire de faire vivre le rapport Quinet, au sens de le compléter plutôt que le remettre en question.

La mise en place d'un comité d'experts sur les méthodes d'évaluation des projets d'investissement public, devient maintenant urgente et nous souhaiterions que vous acceptiez de le présider. Conscients de la charge de travail qui pourrait vous faire hésiter, nous vous proposons que la vice-présidence en soit assurée par Jean-Paul OURLIAC.

Monsieur Roger GUESNERIE  
Professeur  
Paris School of Economics  
48, boulevard Jourdan  
75014 Paris

Vous trouverez annexé au présent courrier un texte plus détaillé présentant le rôle possible de ce comité ainsi que sa composition et son fonctionnement : nous serions ravis d'en discuter avec vous.

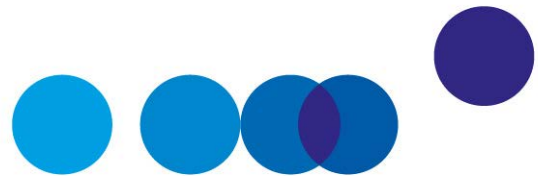
Nous souhaitons vivement que vous acceptiez cette responsabilité car le respect que vous inspirez à la communauté des économistes est de nature à faciliter la participation d'économistes de qualité à ce comité, et devrait faciliter la prise de recul sur des querelles parfois peu rationnelles.

Nous vous prions de croire, Monsieur le Professeur, à l'expression de notre considération distinguée. *et de vos meilleurs vœux.*

  
Jean Pisani Ferry

  
Louis Schweitzer





## Appendix 3

# Committee of Experts on Methods for socioeconomic evaluation of public investment: missions and composition

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### Missions

The committee has been entrusted with four missions:

- specifying the methodological rules for performing socioeconomic evaluation;
  - application in the field of transport;
  - assisting in the creation of such rules in other fields: deployment of ultra-high-speed broadband, hospital projects, higher education building projects, research projects, culture projects, etc.;
- specifying studies and research for this purpose;
- promoting the use of socioeconomic calculation by adapting it to overcome difficulties encountered in its application;
- contributing to popularising and promoting the practice of socioeconomic calculation.

### Composition

Chairman: Roger Guesnerie

Vice-Chairman: Jean-Paul Ourliac

Secretary-General: Luc Baumstark

#### *Members*

Claude Abraham

Jean Bergognoux

Dominique Bureau

Jean-Michel Charpin

Christian Gollier

Michel Massoni

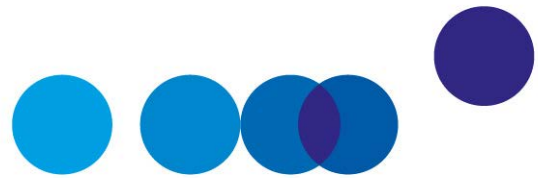
Joël Maurice

Florian Mayneris

Émile Quinet

Nicolas Riedinger

Lise Rochaix



## Appendix 4

### Glossary

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**AVOIDED INVESTMENT:** Investment that would have been made in the baseline option but is not made in the investment option.

**BASILINE OPTION AND INVESTMENT OPTION:** The baseline option is the contracting authority's intervention choice corresponding to the most probable optimised action when the project is not carried out within the allotted time frame. The baseline option is not a “*do-nothing*” decision: it must include operations (investment, operation, or other actions) which might be required if the project is not carried out (so-called “*do-minimum*” option). Operating conditions should be optimised in this regard. Socioeconomic analysis of an investment option is carried out by comparing its effects with the baseline option's; it shows whether it would be better to carry out the investment option rather than the baseline option, but not whether another investment option would have been better. Hence the importance of choosing the right option and carrying out several comparisons of possible investment variants.

**CONSTANT PRICES:** Prices of a base-year adopted in order to exclude inflation. They are distinct from current prices.

**COST-BENEFIT ANALYSIS:** Quantitative approach to determining whether or to what extent an investment is opportune from a socioeconomic perspective. Cost-benefit analysis differs from financial analysis in that it takes all an investment's gains and losses into consideration. In particular, cost-benefit analysis should result in calculation of a socioeconomic present net value.

**CURRENT PRICES** (or nominal prices): Actual prices observed over a given period. They include the effects of general inflation and are in contrast to constant prices.

**DISCOUNT RATE:** Rate at which future values are discounted. Financial and socioeconomic discount rates may differ.

**DISCOUNTING:** Procedure for estimating the present value of a future cost or benefit by application of a discount rate, i.e. by multiplying future values by a specific coefficient.

**EX-ANTE ASSESSMENT:** Prior assessment carried out with a view to deciding on an investment. It provides the most coherent and pertinent conception possible of the investment, along with the necessary basis for later monitoring and assessments, and, as far as possible, ensures that objectives are taken into full account by the investment project.

**EXISTING SITUATION:** Description of supply, demand and the state of territories concerned at the time the socioeconomic evaluation is carried out, as well as all decisions underway across the territories concerned.

**EX-POST ASSESSMENT:** Assessment carried out some time after completion of the project. It seeks to check an investment's real impact in comparison with initial aims and *ex-ante* forecasts.

**EXTERNALITY:** A project's effect observed outside the scope of the project itself, and as such not included in financial analysis. An externality appears when production or consumption of a good or service by an economic unit has a direct effect on the wellbeing of other production or consumption units, without there being any form of financial compensation between such units. Externalities may be positive or negative.

**FINANCIAL ANALYSIS:** Analysis enabling anticipation of the financial resources required to cover expenditures connected with an investment. Financial analysis may be carried out from the viewpoint of any public or private entity that invests in or subsidises a given project. Such entities may be public authorities, lenders or the operation's future operators, which, without necessarily taking part in its operation, expect some kind of direct or indirect financial return for their participation. Among other things, financial analysis enables an investment's financial viability to be checked and guaranteed, along with calculation of indicators of the investment's financial performance based on discounted net cash flows.

**FINANCIAL DISCOUNT RATE:** Rate representing the financial resource's cost to the entity from whose point of view the investment is made.

**FINANCIAL NET PRESENT VALUE:** Sum of a project's financial costs and future financial receipts, discounted for a baseline year with the help of the financial discount rate.

**INVESTMENT COST:** Capital expenditures incurred in order to carry out a project or programme.

**MARKET VALUE:** Price at which a good or service is traded on the market. This is the price that must be used for financial analysis.

**MONETISATION:** Procedure consisting of assigning a monetary value to evaluation criteria whose unit of measurement or account is not monetary.

**NET PRESENT VALUE (NPV):** Sum obtained when the discounted value of future costs is deducted from the discounted value of expected future benefits. The socioeconomic net present value is distinct from the financial net present value.

**OFFICIAL SOCIAL VALUE:** Value assigned to a non-market good, defined by the public authorities, representing its value (or cost) for the community, and intended for use in socioeconomic calculations.

**OPERATING COSTS:** Expenditures incurred in the operation of an investment, including maintenance costs but not including depreciation costs or investment expenditures.

**OPPORTUNITY COST OF PUBLIC FUNDS:** Coefficient to be applied to every euro of public expenditure and revenue in socioeconomic calculations, reflecting imbalances introduced by tax levies and subsidies, which are costly from the point of view of the market's economic efficiency.

**OPPORTUNITY COST:** Marginal cost expressing shortfalls occasioned by a choice (of investment, production, distribution, etc.). For example, the cost of storing raw materials may represent an opportunity cost.

**PROGRAMME:** Coordinated series of different projects whose political context, aim, budget and deadlines are clearly defined.

**PROJECT:** Operation comprising a series of works, activities or services with clearly established aims. In other words, an investment activity for which resources are disbursed (the costs) with a view to creating assets enabling production of benefits over an extended period of time.

**RECEIPTS:** Revenue expected from an investment, obtained by invoicing the service/good concerned or imposing charges.

**REFERENCE SCENARIO:** Set of variables exogenous to the project. It therefore represents the context in which the project is evaluated, and hence is by definition common to the baseline option and investment options. The reference scenario includes hypotheses on evolutions in the GDP, the population, fuel costs, etc.

**RESIDUAL VALUE:** Net present value of assets and liabilities for the last year of the period selected for evaluation.

**SOCIOECONOMIC COSTS AND BENEFITS:** Social costs and benefits for the whole society. These may differ from private costs insofar as they may include externalities (social cost = private cost + external cost).

**SOCIOECONOMIC DISCOUNT RATE:** Rate that tries to reflect the social point of view in the way in which the future should be evaluated in comparison with the present.

**SOCIOECONOMIC NET PRESENT VALUE:** Sum of positive and negative benefits resulting from a project, discounted for a baseline year with the help of the socioeconomic discount rate, evaluated in the context of a cost-benefit analysis.

**SYSTEMIC RISK:** Risk borne by the community arising from the correlation existing between an investment's expected benefits and economic growth.

**WILLINGNESS TO PAY:** Sum that consumers are ready to pay for a good or service.





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