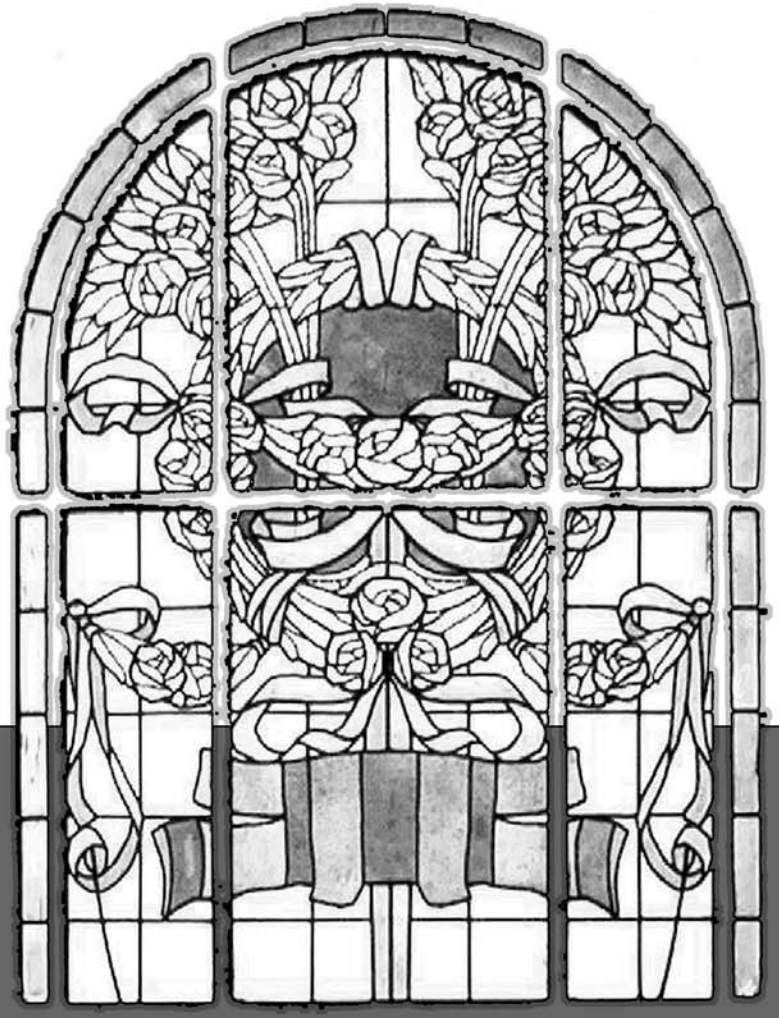

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FINANCIAL ANALYSIS AND INFRASTRUCTURE PROJECTS: THE FINANCIAL BUDGET PLAN FOR THE IMPLEMENTATION OF THE "INFRASTRUCTURE FRAMEWORK LAW"

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The *Public Investment Evaluation Unit* (UVAL) provides technical support to public entities by developing, testing and disseminating ex-ante, ongoing and ex-post evaluation methods for public investment projects and programmes. One of the aims is to improve effective spending and better performance of European Structural Funds. The Unit is part of the network of national and regional evaluation units.

UVAL conducts its activity under the Department for Development and Cohesion Policies (DPS), transferred to the new Ministry for Economic Development with Decree Law 181 of 18 May 2006 (ratified with amendments by Law 233 of 17 July 2006). UVAL was first established with its current structure and form in 1998, in the context of the wider restructuring of development policies functions, under the overall responsibility of the Ministry for the Economy and Finance. UVAL is staffed with a maximum of 30 members, coordinated by a Unit Head, and is part of the Public Investment Technical Evaluation and Monitoring Unit. UVAL reports directly to the Head of the DPS.

The Unit provides evaluations of various aspects of investment programmes and development projects, including their relevance and coherence with economic policy directions, their economic and financial feasibility, their compatibility and cost effectiveness compared with alternative solutions, as well as their socio-economic impacts in the geographical areas they aim

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Financial analysis and infrastructure projects: the Financial Budget Plan for the implementation of the "Infrastructure Framework Law"

Abstract

Article 4, paragraph 134, of Law 350 of 24 December 2003 (the 2004 Finance Law) established that requests to CIPE for grants to help finance strategic projects falling under the fast track "Infrastructure Framework Law" (Law 443/01) whose operation could potentially generate revenues should be accompanied by a specific financial budget plan (PEF), to be drafted on the basis of a model format approved by CIPE. In the last two years a number of activities, including data analysis and consultation with the parties involved, have been carried out under the aegis of UVAL with a view to releasing an operational version of an analytical model PEF on an electronic spreadsheet platform. This paper describes the methodology underpinning the PEF to gauge the appropriate size of the public grant to the project, with a view to meeting the increasing demand for such a tool from project sponsors, advisers and end users. The fundamental assumptions underlying the model are also reviewed in the paper. The model PEF is presented in a general format as it may be used for various kinds of projects. This offers a clear advantage in terms of its end-of-pipe flexibility, although this must be balanced against the adaptive effort required to apply it fruitfully to more specific types of infrastructure projects.

Analisi finanziaria e grandi opere: lo schema tipo di Piano Economico-Finanzario per l'attuazione della Legge Obiettivo

Sommario

L'art. 4, comma 134, della legge 24 dicembre 2003, n. 350 (Legge Finanziaria per il 2004), ha previsto che la richiesta al CIPE di assegnazione di risorse a fondo perduto a sostegno della realizzazione delle opere strategiche di cui alla cosiddetta "Legge Obiettivo" (Legge n. 443/01), la cui gestione presenti potenziali ritorni economici, dovesse essere accompagnata da un apposito Piano Economico-finanziario (per brevità PEF), predisposto secondo uno schema tipo approvato dal Comitato stesso. Nel corso dell'ultimo biennio sono state svolte presso l'UVAL attività di analisi, elaborazione e consultazione che hanno permesso di realizzare su foglio elettronico una versione operativa di un modello di PEF analitico. Questo lavoro si prefigge di descrivere le metodologie sottostanti al PEF dirette a valutare l'entità del contributo pubblico ai progetti infrastrutturali, allo scopo di condividerle con la comunità dei promotori e degli utenti. Il lavoro chiarisce le ipotesi sottostanti al modello e ne descrive il funzionamento, anche al fine di rispondere alla domanda crescente che proviene dai promotori istituzionali e dalla consulenza. Lo schema di PEF descritto nel lavoro ha carattere generale, essendo applicabile a diverse tipologie di opere. Ne derivano vantaggi in termini di flessibilità applicativa che tuttavia si associano a esigenze di adattamento per applicarlo con lo stesso grado di dettaglio a specifiche tipologie di infrastrutture.

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We also thank the participants in the inter-departmental working group established to define the structure of the full financial budget plan, coordinated by UVAL. A special thanks goes to Bernardo Bini-Smaghi and Vincenzo Ferro of Cassa Depositi e Prestiti SpA, Marco Pignoli of Sogesid SpA and Gabriele Ferrante and Pasquale Marasco of the Project Finance Technical Unit of the Ministry for the Economy (now under the Prime Minister's Office) for their invaluable contribution of ideas and insights during many meetings and informal discussions. Obviously, any remaining inaccuracies in the paper are the authors' responsibility alone.

Contents

I. Introduction

Italy's current public investment policy exists against a backdrop of a persistent infrastructure deficit compared with the rest of the European Union and the macroeconomic constraints that the Stability and Growth Pact imposes on the use of public resources to close that gap.

In such a context, the specification and adoption of criteria and instruments for the economic and financial evaluation of projects becomes a central element in a public strategy aimed at optimising the use of resources and defining investment choices.

A significant and sustained commitment of public resources is necessary to make up for this comparative shortfall in infrastructure. In the present situation of budgetary restrictions, it is essential to establish procedures to ensure the correct evaluation of public investment projects, through which government entities can assess financial profitability, if any, and the associated social and economic benefits.

To achieve this objective, the most common internationally accepted methodology is cost-benefit analysis. This tests the project's capacity to achieve its stated economic policy objectives, as well as to ascertain the appropriate volume of any public support required to make it financially sustainable.

In order to assess the financial side of investment projects appropriately, Art. 4, paragraph 134, of Law 350 of 24 December 2003 (the 2004 Finance Act) establishes that that requests submitted to the Interministerial Committee for Economic Planning (CIPE) for grants to support the construction of strategic works under the fast-track "Infrastructure Framework Law" (Law 443/01) that can potentially generate revenues should include a financial budget plan (PEF). This is to be drafted in accordance with the model plan approved by CIPE itself pursuant to paragraph 140 of the same law[1].

The requirement reflects legislators' desire to ensure the financial sustainability of projects approved by CIPE and to provide the Committee with the information necessary to evaluate the appropriateness of the funding requested, assessing the availability of any other sources of financing as well (fee revenues, loans, equity capital etc.).

In the first half of 2004 UVAL coordinated the activities of an inter-institutional working group with a mandate to define the basic structure of the financial model[2].

[1] The European Commission, in Regulation 1260 of 1999, also requires government entities that plan to carry out infrastructure projects worth more than €50 million to present the results of the cost-benefit analysis of the projects.

[2] The work group was composed of representatives from a number of central government and other public entities involved in the financing of public works.

Interaction between members of the working group, as well as subsequent refinements conducted bilaterally or independently by UVAL, produced a functioning, albeit experimental, version of an analytical PEF model[3]. This implemented the provisions of CIPE Resolution no. 11 of 27 May 2004, which envisaged the preparation of:

- a summary overview of the PEF in which the project sponsors provide a condensed version of the main information generated by the financial analysis of the project;
- an analytical version of the PEF, to be given to the sponsoring entities as a tool for the preparatory analysis for the drafting of the summary overview.

Resolution no. 11/04 invites applicant administrations "*to use the analytical PEF model during the preparatory phase in order to facilitate the preparation of the aforementioned summary"*, providing for the model to be made available in electronic format on the CIPE website[4]. Moreover, sponsor entities are required to complete the analytical PEF model on the basis of the methodologies and examples contained in Part II of the Appendix to the resolution, appending the data to the documentation relating to the projects for which CIPE requests additional information.

This paper seeks to disseminate the analytical PEF model through the official UVAL publications channel, documenting the principal methodological choices made. This approach is also intended to satisfy the growing demand from the entities sponsoring projects and their private consultants for access to the PEF model, in light of the Government's intention to accelerate infrastructure projects for development in the coming months.

UVAL has adopted this approach, within the limits of the available analytical information, to meet the requests of the Central Secretariat of CIPE to provide substantiated opinions on the appropriateness of public grants for works included in the Strategic Infrastructure Programme referred to in Law 443/01 (the "Infrastructure Framework Law") and CIPE Resolution no. 121/01.

To mid-2006, these requests involved 40 projects. The opinions issued by UVAL, summarised through a four-level scoring system, concerned the evaluation of the consistency of the basic data sheets with the relevant legislation in terms of both completeness of information provided and its suitability for determining the amount of the financial contribution requested from CIPE to be charged to the resources appropriated under Law 443/01 and Legislative Decree 190/02.

[3] At the application level, the model consists of a set of interconnected Excel spreadsheets.
[4] The electronic version of the application will be available for download on the CIPE website once a number of administrative issues have been resolved.

Experience gained from the assessments UVAL has conducted so far indicates that more systematic use of the analytical PEF model could eliminate the common problems of information incompleteness and/or inconsistency in the summary overview.

This study seeks to offer a methodological contribution to encourage the use and "*in vivo*" refinement of the complete version of the application, also with a view to reviewing the projects to be implemented under the aegis of the Infrastructure Framework Law, an effort that is already under way.

Ideally there should be greater collaboration from the other entities involved, which could make more systematic and regular use of the support which UVAL can provide, as underscored by a recent report from the Court of Auditors[5].

Referring to arguments previously advanced by UVAL, the Court emphasises that "*UVAL's monitoring activities do not merely constitute a tool supporting the decision-making process and a source of information underpinning forecasts for the project and financial progress of the Infrastructure Framework Law. Thanks to the accumulation of information over time, they also provide a sound basis for any evaluation of the effectiveness of the tool and, in particular, for contextualising and correctly interpreting the robustness and accuracy of the results of the financial business plan. Furthermore, these monitoring activities have provided an indispensable information base for conducting any independent evaluation of the economic and social repercussions of initiatives seeking financing under the Infrastructure Framework Law*".

The PEF model described in this work is of a general nature, and as such it is applicable to various types of project. While on the one hand this increases the flexibility with which the model can be applied, on the other it requires significant adaptations if the model is to be used to take account of the specific characteristics of different types of infrastructure.

It should be clarified immediately that this study has no claim specialist or scientific ambitions. Rather it seeks to provide methodological support in order to share certain accounting tools for the evaluation of infrastructure projects under CIPE with the community of sponsors and institutional users. The paper is organised as follows: section II contains a general discussion of the financial analysis of projects, which is examined in relation to cost-benefit analysis; section III outlines the general contents of a financial plan for an infrastructure project, focusing primarily on demand analysis; section IV provides a relatively detailed description of the system of interconnected or

[5] Corte dei Conti, Sezione centrale di controllo sulla gestione delle Amministrazioni dello Stato, Deliberazione n. 15/2006/G, *Relazione concernente le risultanze della gestione dell'Intervento infrastrutturale strategico in project finance "Interporto di Civitavecchia" inserito e finanziato nel programma della legge n. 443/01 (c.d. Legge Obiettivo)*", del 16 novembre 2006. Text available in Italian at:. http://www.corteconti.it/Ricerca-e-1/Gli-Atti-d/Controllo-/Documenti/Sezione-ce1/Anno-20061/Adunanza-c/delibera-Civitavecchia.doc_cvt.htm

"cascade" accounts which constitute the operational method of the PEF; and section V presents a case study for the application of the PEF to an infrastructure project. The final appendix, which sets out the summary version of the detailed PEF, is followed by a glossary of a number of technical terms.

II. The objectives of financial analysis

The financial analysis (FA) of a project constitutes the initial stage, or a prerequisite, of a broader cost-benefit analysis (CBA). The FA differs from the CBA in that it is only concerned with actual monetary costs and revenues associated with the project, without evaluating its socio-economic repercussions.

In general, it is possible to pass from the FA to the CBA and vice-versa using appropriate adaptations and additions. In effect, the FA constitutes the central element or hinge between the preliminary market analysis and technical-regulatory feasibility study of an infrastructure project and the actual economic analysis, which is undertaken in the CBA[6].

The main purpose of the FA is the verification of the project's profitability and sustainability, both of which are evaluated from a strictly financial perspective. The assessment of profitability aims to ascertain the project's capacity to cover total costs (construction and operation) over the term of the concession for use of the infrastructure, as well as to generate a gross margin through operations for the remuneration of the financial resources provided by third parties. The sustainability analysis aims to evaluate the capacity of the project to produce sufficient revenues each year to cover current expenditure and service the debt.

The most common method of comparing the cost and revenue elements considered in FA is the discounted cash flow method, which involves recognising the monetary items associated with the project, excluding those that do not give rise to actual cash flows (such as amortization, on the cost side, or increases in the value of assets, on the revenue side), and discounting their value to the initial year using an appropriate discount rate.

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[6] The extremely close connection between these two types of analysis is recognised by the same provision of the 2004 Finance Act (Law 350 of 24 December 2003), which states that plans for large-scale projects subject to financial approval by CIPE must be supported both by CBA and by FA, although it only stipulates a specific obligation for the latter. Article 4, paragraph 134, states that the request for funds for infrastructure projects that "present a potential economic return deriving from the operation of the work itself, with the exception of infrastructure included in the financial plans of the concession holders and in the related future addenda" must be supported by "a cost-benefit analysis and a financial plan to be prepared on the basis of a model format, which must be approved by this Committee pursuant to paragraph 140 below".

The information necessary for conducting the FA of an infrastructure project includes outlays for investment, operating costs and revenues, financial resources to cover the employment of capital, as well as the legal, technical, fiscal and commercial parameters that regulate the economic use of the project.

Since FA is a methodology which seeks to determine the substantive profitability of a project, it is strictly connected with the profit and loss account (where flows are registered annually on an accrual basis rather than a cash basis) and with the balance sheet (which periodically documents the assets and liabilities of the corporate vehicle which, among its other activities, is responsible for the construction and management of infrastructure). The FA differs from these basic accounting records in that it is conducted for the project rather than the company which operates the service after the construction of the infrastructure. This difference in the "points of view" adopted by the FA and the analysis of corporate financial statements influences the nature and purposes of the information that can be obtained from the two tools.

The PEF model developed by UVAL takes a specific point of view: that of the public entity – in this case CIPE – called upon to assess the soundness of the request for public funding by the project sponsor, and therefore the consistency of the grant requested with the "reasonable" profitability of the project.

To this end, the PEF model calculates the profitability of the project on the basis of predefined choices regarding the level of fees planned for infrastructure operations for the given initial amount of the grant requested from CIPE.

In addition to this primary application, the model can be put to complementary uses. Specifically, it can be used to conduct sensitivity analyses to evaluate changes in the profitability of the project or the invested capital with different levels of public funding[7]. Its use can also be extended – albeit non-interactive mode – to the analysis of trade-offs between fee levels and the amount of the funding sought from CIPE, seeking to identify the combinations of fees and CIPE funding generating the same financial profitability (and hence the "eligibility" of the investment for financing) within the constraints of the legislative and regulatory framework: greater funding from CIPE make it possible to keep fees relatively low (which will therefore be more acceptable socially and politically), but at the cost of reducing the availability of funds to finance other projects. The choice among these different objectives (involving different benefits and time horizons) is typically political. However, a tool such as the PEF makes it possible to base the final decision on "objective" financial information.

[7] For an example of this use, see the case study in section V.

One characteristic underlying the PEF application is the incremental vision of demand projections and other key technical and economic variables (compared with the situation prior to the implementation of the project in question). This means any cost or revenue flows generated by the economic exploitation of the infrastructure (or parts thereof) prior to the construction and operational management of the works are not taken into consideration. In line with this approach, the calculation schedules assign values to the items that are functionally dependent on forecast developments in volumes and unit costs only as from the first year of operations, which as a working hypothesis coincides with the year immediately following the end of construction[8].

III. Economic and financial planning: general remarks

Broadly speaking, the financial budget plan (PEF) can be defined as the accounting instrument with which the technical and economic foundations of the project (the equivalent of the business plan for a company) are translated into a system of monetary accounts in order to verify the economic and financial viability of the project[9].

In the case of planning at a company level, the economic and financial forecasts that form the basis of the business plan are a profit-and-loss and balance-sheet budget, explanatory notes and a cash flow budget.

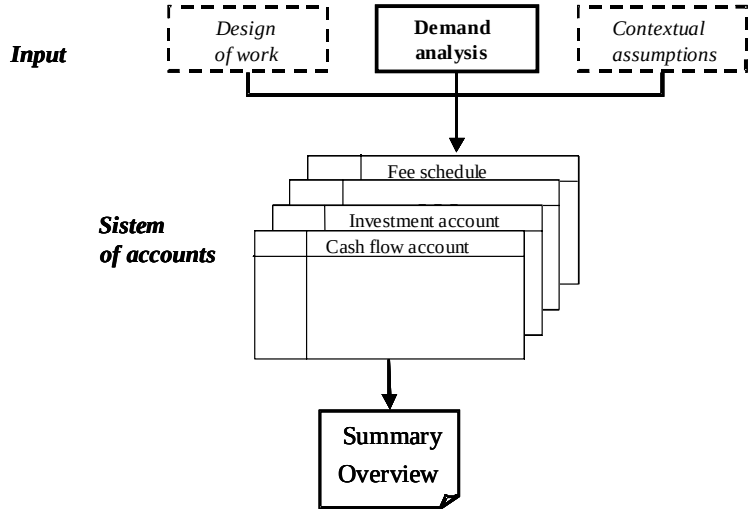
The financial evaluation of an infrastructure project is slightly different. In this case, the PEF is normally structured on three levels (see Figure III.1). The first level contains the inputs, namely the information identifying the technical and economic characteristics of the project whose financial sustainability must be analysed using the PEF. This includes the technical specifications contained in the preliminary design, the analysis of demand and a set of assumptions concerning certain key parameters that characterise the economic and regulatory context for the project in question.

The following section provides a brief description of the structure of a typical demand analysis module (although it is not developed in the computer application), since the technical contents of the preliminary design phase are affected by the criteria established by regulations and the contextual assumptions should be easily derivable from the macroeconomic framework and the relevant institutional sources.

[8] Appropriate controls incorporated in the application ensure that this condition is fulfilled.

[9] Article 4, paragraph 134, of the 2004 Finance Law (Law 350/2003) is not the only legislation to require the preparation of a financial analysis prior to the evaluation of projects of public interest. Article 4 of Law 144/1999 – the so-called framework law for public investments – establishes that the approval of an infrastructure project should be preceded, in certain cases imperatively, by the preparation of a feasibility study containing, among other elements, an analysis of design alternatives, the technical, administrative and financial feasibility of the project and its socio-economic value. FA is clearly located in the intermediate stage of this process.

Figure III.1 Structure of the analytical PEF



Source: UVAL

The second level involves the system of financial accounts, namely the PEF itself. This uses the technical and economic data provided by the input module in order to evaluate the financial sustainability of the construction and operation of the works. This process includes preparing composite indicators to characterise the different combinations of financing for the project. The complete system of accounts is described in section IV.2, which also addresses the context parameters.

The third level contains the summarised results of the analysis performed in the previous phases. More specifically, this contains the indicators and summary information which can be used by analysts to evaluate the project. In this case, the recipient of this information is CIPE, which will determine the amount of funds to be earmarked for the project[10].

III.1 Demand analysis

Demand analysis is one of the key elements in the input phase for an analytical PEF, on both the cost and revenue sides. Demand analysis should enable the correct sizing of the project in relation both to the quantity and quality of the service to be provided and the volume of revenues from the use of the infrastructure (in the form of usage fee income or ancillary revenues). As noted above, demand forecasts must be incremental:

[10] This information is summarised in the schedule described in the Appendix.

in other words, for a given maximum potential demand, the forecasts make it possible to scale the works to satisfy all or part of the additional need.

Table III.1 illustrates an approach to organising the information needed to estimate developments in the volume of demand over the time horizon of the PEF. It has the following characteristics:

a) it distinguishes between an initial situation "without" the project and a situation "with" the project, in order to identify any demand generated by the project itself (induced demand) which therefore adds to "spontaneous" demand developments (trend demand), namely that associated with exogenous demographic or socio-economic factors[11];

b) similarly, on the supply side the approach distinguishes between "trend" growth in the service (namely the volumes that would have been provided, even without the new works, thanks to the operation of existing infrastructure) and "incremental" growth (increase in capacity), deriving from the construction of the works ("project" supply). This distinction seeks to enable the project to be sized on the basis of the portion of demand that would have been unsatisfied if the infrastructure had not been built (the situation "without" the project) given the capacity limits of existing infrastructure. This makes it possible to evaluate the amount of demand that would still be rationed after the construction of the infrastructure.

c) it should nevertheless be borne in mind that the system of accounts adopts a simplified view of the actual functionality of the infrastructure. In particular it assumes that it is indivisible, or that it can meet incremental demand only after completion of the construction phase. In other words, for the sake of simplicity and generality, the financial modelling approach adopted does not make it possible to take account of infrastructure in which operational start-up is gradual and where it is possible to meet part of the incremental demand from the start of the construction phase.

[11] For example, a new road will attract traffic that was previously served by existing infrastructure (traffic therefore affected only by "trend developments" in demand), and may also generate increased traffic as a result of changes in the relative convenience and the attractiveness of the areas served.

Table III.1 Analytical table of supply and demand

	Line reference	Calculation formula		Unit of measurement	Years						
					Year	0	1	2	3	4	…..	Final year
Without project			**Trend demand**									
	(a)		Number of users	Number of persons, households, etc.								
	(b)		Unit quantity of service per user	Cubic meters, trips, etc.								
	(c)	(a) x (b)	Total quantity of service requested (number of users per unit quantity)	Cubic meters, trips, etc.								
			Trend supply									
	(d)		Total quantity of service supplied	Cubic meters, trips, etc.								
			Balance									
	(e)	(c) - (d)	Deficit (unmet demand))	Cubic meters, trips, etc.								
With project			**Demand**									
			Trend demand									
	(f)	= (c)	Total quantity of service requested (number of users per unit quantity)	Cubic meters, trips, etc.								
			Induced demand									
	(g)		Number of users	Number of persons households, etc.								
	(h)		Unit quantity of service per user	Cubic meters, trips, etc.								
	(i)	(g) x (h)	Unit quantity of service per users	Cubic meters, trips, etc.								
			Total demand									
	(j)	(i) + (f)	Total quantity of service requested (trend plus induced)	Cubic meters, trips, etc.								
			Supply									
	(k)	= d)	**Trend supply**	Cubic meters, trips, etc.								
	(l)		**Project supply**	Cubic meters, trips, etc.								
	(m)	(k) + (l)	**Total supply**	Cubic meters, trips, etc.								
			Balance									
	(n)	(j) -(m)	Deficit (unmet demand after project)	Cubic meters, trips, etc.								

Source: UVAL

IV. The system of accounts for financial analysis

IV.1 The general framework of the PEF

The development of the system of accounts for validating the sustainability of the PEF drew on methodological ideas taken from systems prepared by leading national and international institutions[12]. The methodology developed here reflects in particular the indications contained in a well-known contribution from the European Commission on the economic assessment of investment projects seeking Community funding.

The key elements which informed the development of the PEF were simplicity of compilation, operational functionality and consistency with the demands of the preliminary planning phase, when the financial structure of the project operator has not yet been determined, just as no choice has been made between adopting a project finance approach or a more conventional corporate solution, namely one that is based on the financial strength of the company that carries out and manages the project.

It is therefore a simplified instrument created for specific, limited purposes. It is not capable of determining, inter alia, the best balance of equity and third-party financing of the liabilities of the entity managing the infrastructure, nor of calculating its cost of capital. In substance, the PEF model described in this section differs significantly from corporate financial statements, since it does not contain a profit and loss account or a balance sheet.

The PEF is made up of a set of reports and tables. Their compilation and execution makes it possible to document the profitability of the project (and the capital invested) on the basis of a number of exogenous hypotheses. These include developments in fees and demand (namely revenues, both ordinary and ancillary), the level, structure and development of investment and operating costs, the level of interest rates, the time needed to execute the work, and technical, fiscal and commercial parameters.

From an IT perspective, the PEF application was developed using a widely available individual productivity tool (MS Excel) to ensure it can be used by a broad range of

[12] A number of methodological references were used in the implementation of the PEF, including the Guide of the Regional Policy DG (2002). The Guide sets the methodologies of cost-benefit analysis in the context of the regional policy of the European Union, providing suggestions for developing the analysis of alternative projects, financial and economic analysis and risk analysis. Among the other documents consulted, of particular note was Circular no. 1227 of Cassa Depositi e Prestiti, containing *Istruzioni generali per l'accesso al credito della Cassa*, and *Studi di Fattibilità delle Opere Pubbliche - Guida per la certificazione* produced by the Regional Teams for the evaluation and verification of public investments, and finally, the Modello unificato di piano finanziario per le concessionarie autostradali from Decree 125 of 15 April 1997 of the Ministry for Public Works, approved in agreement with the Treasury Ministry, on the basis of CIPE Resolution 20 December 1996. Among the vast literature on the subject, useful methodological information can be found in the collection produced for Formez by Parmentola and Rotondo (2004).

users. It is made up of eight separate modules – consisting of an equal number of interconnected spreadsheets (of which one for the general management of the application, two for inputting data, four intermediate calculation sheets and one showing a summary of results):

1. an initial ***Master*** command module with hyperlinks to the individual spreadsheets within the application;
2. an ***Operating Assumptions*** module for entering operational, financial and fiscal parameters necessary for verifying financial sustainability;
3. a ***Demand Developments, Fees and Operating Costs*** module for inserting the exogenous determinants of rate changes;
4. an intermediate ***Investments, Working Capital and Debt Repayment*** module for determining the timescale of investments, the formation of working capital and the amortisation plan for institutional financing;
5. a ***Cash Flow*** module for cash flows;
6. a ***Profitability Measures*** module for calculating profitability indicators for the initiative;
7. a ***Summary of Fixed Investments and Related Financing***, a summary control module that documents the balance between investment costs and related financing;
8. a ***Summary Overview*** containing the information necessary for compiling the quantitative part of the summary overview.

In order to limit the risk of changes to the algorithms, the cells in the application cannot be modified. Similarly, users cannot change the values of certain cells containing macro-economic variables, which are set at the European or national level.

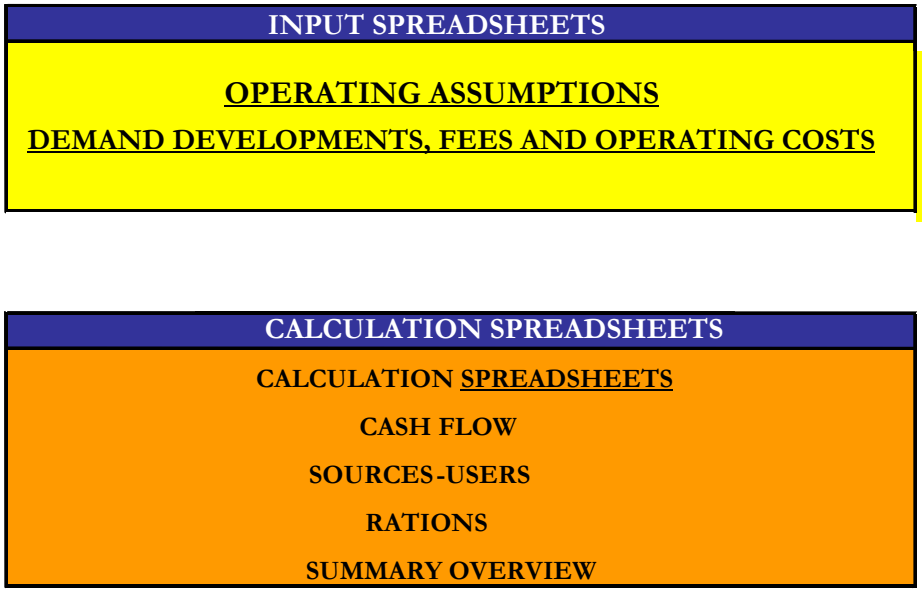
The decision to restrict access to the functional algorithms and certain cells is intended to prevent the errors during manual inputting and to enable comparisons between different projects.

The individual modules that make up the PEF are described as follows, together with a descriptive table without figures, except for parameters that cannot be modified by the user.

IV.2 The structure of the accounts

The first module (*Master*) contains active hypertext links to the two input sheets and the five calculation sheets. The module facilitates interactive use of the application and reinforces the distinction between different kinds of spreadsheets (input sheets and calculation sheets).

Figure IV.1 "*Master*" Module



The second module is dedicated to the inputting of the main variables for the project and the context (*Operating Assumptions*) . This is the first of the two modules in which users must assign a value to the specific data for the project. It must explicitly set out the hypotheses on which the project is based (including the duration of the financial plan, the timetable for the construction and operational phases, the duration of the depreciation of the assets, the year the service delivered with the infrastructure becomes fully operational), the conventional rules for the formation of working capital, the interest rate for the finance charges for the institutional financing, as well as the initial levels of demand in volume, operating costs and fees per unit of service.

As noted earlier, certain variables are pre-set, such as the sequence of planned inflation rates, drawn from the last available Economic and Financial Planning Document, tax rates[13], the social discount rate net of inflation, set at 5 per cent in real terms.

[13] The PEF does not take the Regional Tax on Business Activity (IRAP) into account for reasons of operational simplicity and due to the uncertainty of the legislative framework governing this tax.

It should be noted that since this is a simplified tool (in particular, it makes no attempt to enable detailed industrial accounting for the project), no specific indications are provided for the classification of items under the aggregate cost and revenue categories considered in the PEF. Given the largely standard nature of such categories, allocation among them is left to the "reasonable discretion" of the user.

Users must first set out the initial annual breakdown[14] of the four categories of current operating costs shown in the PEF (operating costs, acquisition of raw materials, staff and ordinary maintenance, expressed net of VAT, where applicable). They must also include the amount of initial annual revenues other than those generated by fees (so-called ancillary revenues). The latter regard proceeds from the sale of services that are strictly linked to the ordinary operation of the work itself[15], which can be paid from the very beginning of operation and which can be entirely appropriated by the operator of the infrastructure (for example, through forms of horizontal integration or recourse to sub-concessions)[16].

Users must include the initial level of investment costs[17], divided into two types:

- *costs eligible for financing*: namely those that arise during the construction period, for which a request can be made for financing from CIPE funds. These have been divided into the following five categories: investments in civil works, investments in plant, expropriations, sundry investments and renovations eligible for financing;
- *costs that are not eligible for financing*: this comprises investment spending – typically associated with extraordinary maintenance and renovation cycles – that is incurred after the period in which the work is carried out, which is not eligible for CIPE financing but contributes (with a negative sign) to the formation of the project's cash flow. A final section asks for the forecast project duration, in years.

[14] The corresponding amounts must be expressed in accordance with the nominal values registered in the year prior to that when the PEF begins.
[15] Namely complementary in consumption or joint in the production of the main service.
[16] This therefore excludes revenues from services that can only be provided following completion of works on which construction is carried out in a series of functional lots or are part of network structure whose segments cannot be developed simultaneously. It also excludes revenues that are not generated by the actual sale of a service but rather take the form of rents from the valuation of intangible externalities. This is the case of the appropriation of the increase in the value of land or property in the vicinity of the infrastructure, or the sharing of this increase with the holder of the property right (for example sharing the associated tax payments to local government), following improvements in the local accessibility of the infrastructure itself.
[17] The investment costs to be included in the plan are understood also to include the labour costs incurred during the construction phase as well as any operating costs incurred in rendering the infrastructure operational.

Values are expressed for the volumes and prices, net of VAT[18], for the PEF's initial year. The algorithm calculates the VAT on the capital goods by applying the corresponding rates to the monetary values net of VAT, differentiated by category of asset. A 10 per cent rate is applied to costs for civil works, plant and machinery, while the 20 per cent rate is applied to other non-current assets.

The amounts indicated in the table must refer to disbursements for the acquisition of fixed assets (principally civil works and plant). Items included in the first of the two classes can incorporate the cost of replacement investments necessary to compensate for the obsolescence of the original assets, as well as for extraordinary maintenance performed during the construction phase. It was decided that public funding can be used to meet these costs (provided they are incurred during the construction phase) since they are necessary to maintain the work entrusted to the operator in good working conditions.

As regards the monetary values of investment costs, in certain cases[19] these could incorporate an inflation component "at source" that captures inflation adjustments during the years of construction. It would therefore be appropriate to verify the existence of this feature with a specific question to the compiler of the PEF regarding the presence of this component in the data.

If the user answers the question affirmatively, where the PEF is being prepared on the basis of current prices the algorithm does not index the investment costs (therefore maintaining the inflationary component included in the annual values entered by the user). This avoids any double counting of inflation in the investment costs and any resulting distortion of the funding requirements for the project.

Conversely, when compiling a PEF at constant prices, for the sake of simplicity the values assigned to the cost components of the project are left unaltered, i.e. without deflating them in advance[20]. If the user answers no to the question and the PEF is therefore being drawn up at current prices, the model indexes investment outflows.

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[18] The choice of reporting investment costs net of VAT is justified by the fact that if the investments are being made by a private party that party may normally recover the VAT paid to suppliers from the users of the service, which would leave little justification for public funds to finance the tax liability. However, if the investments are carried out by a public body, such body is not entitled to pass VAT on to end-users. In this case, the public funds would give rise to a transit item in the amount of VAT on the investments.

[19] For example, when the commissioning entity tenders construction or construction costs are defined in turn-key contracts that specify the works to be constructed and the related reference price.

[20] In this case, logic dictates that investment costs should be deflated in advance, which presumes that the user is asked to specify the implicit inflation component in the cost of the investment, an element that might not be known precisely or which could create analytical difficulties, with consequent requests for clarification.

In the section relating to funding sources for investments, users are asked to describe the breakdown of financing between private capital, public funding other than CIPE funds (differentiating between Community, national and local financing), funds from other institutional sources (such as Cassa Depositi e Prestiti SpA, Infrastrutture SpA or the European Investment Bank). This generates the grant requested from CIPE, given the constraint of the total project cost. Note that the point of view employed by the PEF is strictly that of central government as represented by CIPE: under this profile, any public financing from other sources that contribute to funding the cost of the project have the same status as private financing.

Note also that the "private capital" item represents all funds from private sources, regardless of whether they constitute equity or debt. As mentioned earlier, the financial structure of the party that will manage the infrastructure cannot normally be determined in the preliminary planning phase, during which the PEF is presented to CIPE for the request for funding drawn on resources available under the Infrastructure Framework Law.

The final part of the module in question contains the section where the project sponsor specifies an annual breakdown of the costs relating to the five categories of works and interventions, ideally consequent to the findings of subsequent progress reports[21].

[21] Note that a value for the renovation item may only be specified if the new project is linked to existing infrastructure in the complementary relationship typical of network systems.

Figure IV.2 "Operating Assumptions" module

OPERATING ASSUMPTIONS

Annual ancillary revenues and operating costs (valutati nell'anno precedente all'avvio del PEF)	
	Ancillary revenues (net of VAT)
	memorandum; ancillary revenues / total revenues (%)
+	Administrative costs (net of VAT)
+	Cost of raw materials (net of VAT)
+	Staff costs (gross of social security contributions)
+	Ordinary maintenance costs (net of VAT)
=	Total operating costs
	memorndum: operating costs / total revenues (%)

Investment costs (euros)	
	Investment costs incorporate inflation adjustements during construction period ? (yes/no)
+	Investments in civil works (net of VAT)
+	Investments plant (net of VAT)
+	Expropriations (net of VAT where applicable)
+	Sundry investments (net of VAT)
+	Renovations during construction period (net of VAT)
=	Total cost of investments eligible for financing (net of VAT)
+	Renovations during operating life (net of VAT)
+	Extraordinary maintenance during operating life (net of VAT)
=	Total cost of investments (net of VAT)
+	VAT on investments (excluding VAT)
=	Total investment costs (including VAT)
	memorandum: total investments / gross operating income (%)

Sources of investment financing (euros)	
+	"Private capital"
+	Total other public grants
	UE funding
	National funding
	Local funding
+	Loans from institutions
=	Total non-CIPE funding
	Grant requested from CIPE
	memorandum: CIPE grant / total investment eligible for financing (%)

Fiscal parameters	
	IRES rate
	VAT rate on costs for civil works, palnt and machinery
	VAT rate on other fixed assets and cost components
	VAT on sales
	VAT refunds - current year share
	VAT refunds - subsequent year share

Timing and interest rates	
	Interest rate on loans from institutions
	memorandum: rate on Cassa Depositi Prestiti loans / rate on loans form istitutions
	Repayment period for loans from institutions
	Final yea of repayment
	check date of end of repayment — *check*
	Year construction begins
	Years of construction
	Year construction ends
	Year operation begin
	Years of operation
	Year operations end (end of PEF)
	Years of full operations
	Year depreciation ends
	check date of end of depreciation — *check*
	During of PEF (construction + operations)

Assumptions for working capital (days)	
	Collection from customers
	Other types of revenue
	Payments to suppliers - current inputs
	Payments to supplies - investments
	Basis of calculation

Planned inflation (from EFPD)		
	current prices (yes/no)	
	2007	
	2008	
	2009	*check*
	2010	
	Subsequent years	

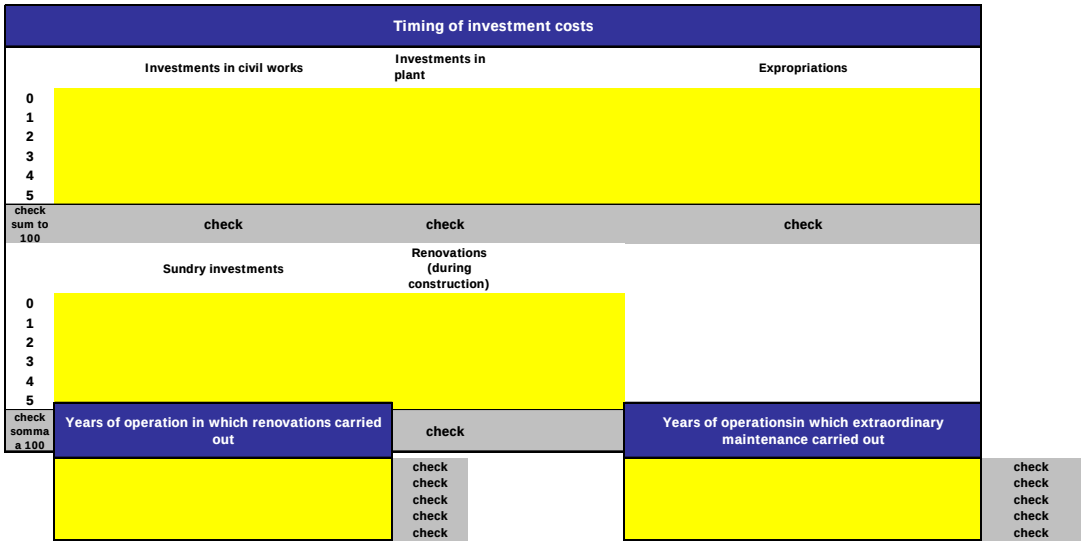
Discounting of nominal values	
	Real discount rate
	Average inflation rate to year operations end (end PEF)
	Discount rate

Prices		
Service 1	Unit fee - initial level (euros, net of VAT)	
Service 2	Unit fee - initial level (euros, net of VAT)	

Induced demand			Unit of measuremen t
Servizio 1	Volumes sold - initial level (physical units)		
Servizio 2	Volumes sold - initial level (physical units)		

continues

continues



Source: UVAL

When developing the PEF format it was decided to express cost and revenue variables in nominal terms. There are several reasons for this, including:

- the explicit connection, required by law, between the initial determination of the rate to be charged and its periodic adjustment using the price cap[22] method, which counsels preparing the PEF on the basis of a "reasonable" forecast of inflation developments, partly with a view to minimising any disputes that might arise on the occasion of the actual rate adjustment by CIPE;
- the advisability of bringing forward, if only as a forecast, the effect of inflation on monetary balances, even under the simplifying assumption of no change in the relative output and input prices of the service delivered by the infrastructure;
- compliance with the methodological recommendations of the aforementioned European Commission guide, which even suggests, albeit as an option, adjustment for changes in relative prices[23];
- consistency with the best practices in use in the financial community, with special reference to project financing, and with current theory in this field[24];

[22] Paragraph 140 of Article 4 of Law 350/03 states: "*Rate adjustments shall be governed using the price cap method, which is understood as being the maximum variation in the unit price for a multi-year period*".

[23] See point 2.4.5 - Adjusting for inflation: "*In project analysis, it is customary to use constant prices, that is to say prices adjusted for inflation and fixed at a base-year. However, in the analysis of financial flows, current prices may be more appropriate; these are nominal prices effectively observed year by year. The effect of inflation, or rather the general increase in the price index, or oscillations in relative prices, may impact on the calculation of the financial return of the investment. Therefore, the use of current prices is in general recommended*".

- the analytical difficulties of correctly calculating a real discount rate or collecting methodologically incontrovertible information on real interest rates, which is obviously not in itself available.

In the years within the time horizon of the PEF – presumably the initial years – for which an official inflation forecast is available, it will be drawn from the most recent Economic and Financial Planning Document (EFPD); for subsequent years the algorithms in the PEF use the same inflation value as that specified for the last year of the government forecasts.

Since this is an instrument to be used by public policy-makers, it was decided to discount the possibility of using alternative forecasts of medium-term price developments, such as those produced by international bodies (ECB, for the euro area[25], the IMF or the OECD, for Italy) or by private entities (such as the *Consensus Forecasts*[26] two-year projections, or by the major national economic research institutes).
The composite measure of inflation used to index costs and revenues is then obtained using the geometric average of the planned annual inflation rates contained in the most recent EFPD[27]. Accordingly, the nominal discount rate used in discounting cash flows at current prices is calculated in the PEF as follows:

$$\textit{nominal discount rate} = [[(1 + \textit{real discount rate}^{28}/100) * (1 + \textit{inflation rate}/100)] - 1\ ] * 100$$

Note that the user is left the option of stating the nominal variables at the constant prices for the initial year of the PEF. Such prices may be used if the legislative or regulatory framework does not envisage the service being provided in return for a price or if a rate schedule exists but the procedures for periodic adjustment have not been regulated. In this case the discounting of monetary amounts will take place, by

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[24] See Brealey and Myers (2000).
[25] The European Central Bank does not normally provide specific inflation forecasts for the monetary union, but instead indicates the two-to-three year price trends that monetary policy decisions are intended to counter. For example, see the analysis contained in the editorial of the monthly Bulletin: "*To sum up, annual inflation rates are projected to remain elevated in 2006 and 2007, and the economic analysis indicates that the risks to price stability remain on the upside.*" (ECB, *Monthly Bulletin*, April 2006, page. 6; see http://www.ecb.int/pub/pdf/mobu/mb200604en.pdf). On the other hand, the objection that the ECB's forecasts refer to the entire monetary area and therefore does not comply with the requirement to use an inflation rate that is representative of Italy could be overcome by noting that in the long term, in line with the operational time horizons for projects under the Infrastructure Framework Law, there will be an increasing macro-economic convergence of the economies within the monetary union.
[26] See: http://www.consensusforecasts.com/Italy.htm
[27] It is assumed that the inflation rate remains constant at that average level for all years after the final year in the three-year period for the EFPD (the three-year succession of official rates will be included in advance by the administrator of the PEF).
[28] Set at a constant 5 per cent.

construction of the algorithms used in the PEF, on the basis of an appropriately deflated discount rate in order to ensure consistency between nominal items and items at present value.

The option of preparing the PEF at constant prices instead of current prices (which is pre-selected as the preferred choice) is explicitly activated by setting the value for the appropriate cell, to which a control test is associated. With regard to the discount rate, a real rate of 5 per cent has been used (as indicated for Italy by the European Union guide to the cost-benefit analysis of investment projects), which corresponds to a nominal rate of almost 6.5 per cent when assuming planned inflation of about 1.5 per cent.

Note that CIPE is responsible for determining whether or not the discount rate should be modified – if it considers this advisable on the basis of appropriate empirical or institutional assessments – through a resolution formally authorising the change.

For the (indicative) calculation of the interest charges associated with repayment of the debt contracted with institutional entities, we recommend using the rate currently applied by Cassa Depositi e Prestiti (CDP SpA) in its lending[29].

In order to facilitate verification of the consistency of certain significant items (ancillary revenues, cost of the investment, size of the contribution requested from CIPE), the module calculates a number of key ratios as memorandum items, which are helpful in evaluating the relative size of such items with respect to appropriate scale variables.

In summary, the ***Operating Assumptions*** spreadsheet requires that the following variables be assigned values:

- Ancillary revenues (net of VAT)
- Administrative costs (net of VAT)
- Cost of raw materials (net of VAT)
- Staff costs (gross of social security contributions on labour costs)
- Ordinary maintenance costs (net of VAT)
- Investments in civil works
- Investments in plant
- Expropriations
- Sundry investments
- Renovations eligible for financing
- Renovations during operating life
- Extraordinary maintenance during operating life
- Private capital

[29] The application has a default value of 4.5 per cent.

- Other public grants, including: *EU funding*
  National funding
  Local funding
- Loans from institutions
- Interest rate on loans from institutions
- Repayment period for loans from institutions
- Year construction begins
- Years of construction
- Years of operation
- Years of full operation
- Year depreciation ends
- Revenues from customers
- Other types of revenue
- Payments to suppliers – current inputs
- Payments to suppliers - investments
- Calculation base
- Unit fee charged to users – initial level (euros, net of VAT; for service 1, service 2, service *n*)
- Volume sold – initial level (thousands of physical units, for service 1, service 2, service *n*)
- Percentage breakdown of temporal allocation of investment costs
- Years for conducting extraordinary maintenance and renovation (during the work's operating life)

The third module is also a data input sheet (*Demand Developments, Fees and Operating Costs Module*). The information requested essentially concerns the demand profile and any annual efficiency gains under a price cap system, as provided for in the 2004 Finance Law for this type of project.

Forecasts of demand developments should be formulated as the annual percentage variations in the annual volumes sold in the period covered by the PEF for each service provided. Based on the demand analysis conducted upstream of the PEF[30], the estimates should regard the incremental portion of demand met by the ordinary operation of the project. Given the incremental perspective adopted by the PEF, the first growth rate for demand to be specified in the module will be that for the year following the first year of operations.

[30] See section III.1.

The inflation rate is used in the PEF to index variable costs, and where appropriate, investment costs, revenues from ordinary operations (rate revenues from users) and other revenues. Preference is again given to using current prices, in line with accepted financial planning procedures.

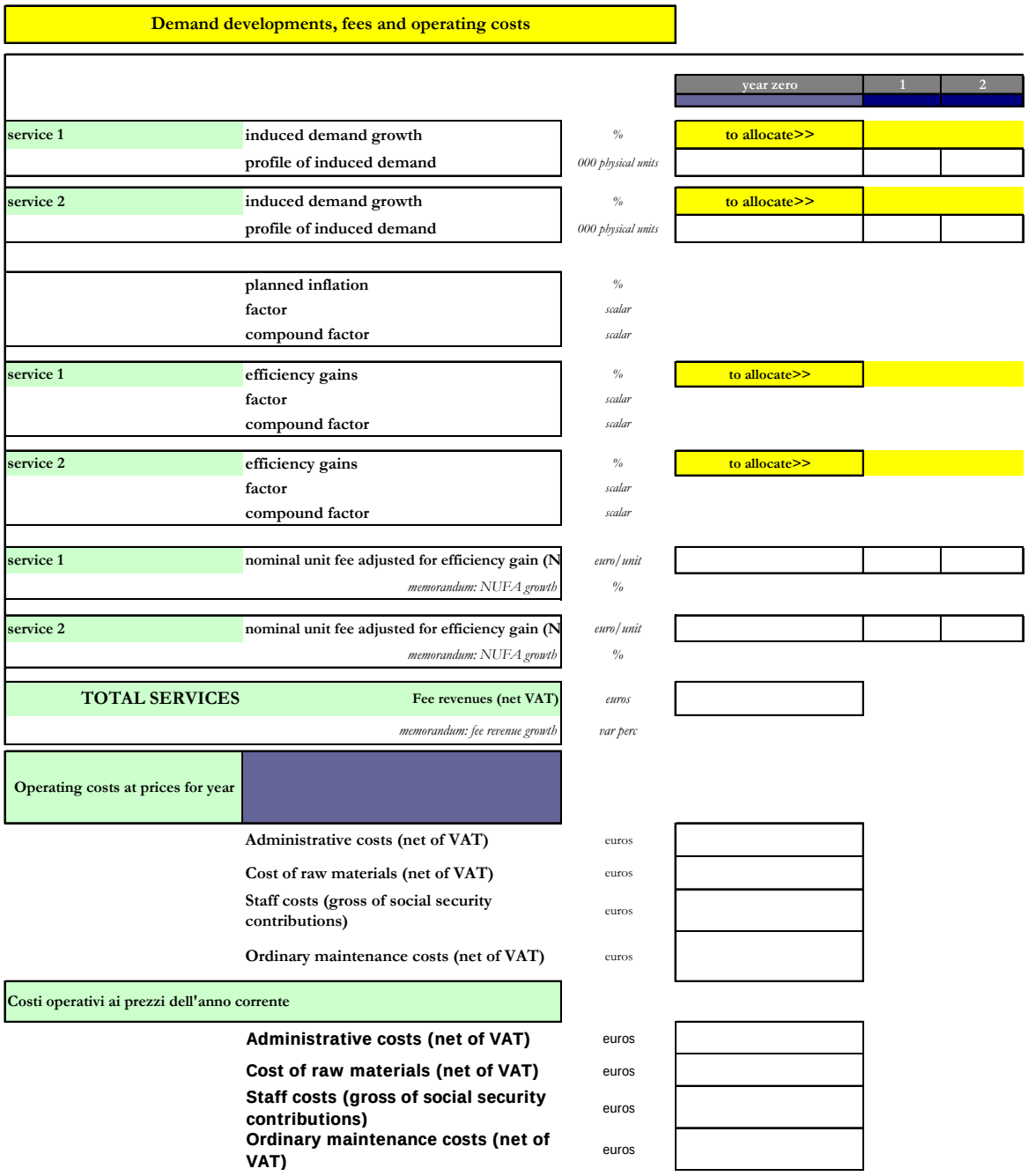
With regard to the efficiency gains – the 'x' in price cap schemes, a variable that the CIPE must quantify for the application of this method at the time of the periodic revisions of initial fees[31] – providing a forecast path of annual productivity gains is optional rather than mandatory. If no reliable information is available on the variables governing the long-term dynamics of productivity in the sector (such as technological developments, organisational changes, scale factors such as the elasticity of variable costs to demand) these variables may be ignored, assigning them a value of zero.

By associating to the time profile of the unit fees with that of demand for the service provided, we obtain a picture of developments in fee revenues for the service (or services), expressed in monetary terms. In order to capture the possibility that more than one service is being delivered with the aid of the works (as in the case of "multiservice" operations), the spreadsheet has been laid out using the simplifying assumption that the typical number of such services is two[32].

[31] See paragraphs 140 and 141 of Article 4 of Law 350/03.

[32] If more than two services are produced that are material to the profitability of the works, the compiler of the PEF must be sure to replicate the relevant parts of the input sheets. Similarly, if only one service is produced with the infrastructure, the input cells provided by default for the second service must not be completed.

Figure IV.3 "Demand Developments, Fees and Operating Costs" module



Source: UVAL

The fourth module, denominated *Investments, Working Capital and Debt Repayment*[33], is an intermediate spreadsheet which first generates the timing of investment costs eligible for financing (expressed in current prices) and then that of the corresponding funding

[33] In the '*Master*' spreadsheet it is indicated as 'calculation sheet'.

sources, given the corresponding breakdown of the construction phases of the types of investment considered, specified by the compiler in the "Operating Assumptions" sheet.

The table is divided into five sections:

- The first section calculates the time sequence in the construction phase of the five categories of investments eligible for financing and the correlated sources of funding on the basis of the profile specified by the user in the first input sheet[34].
- The second section focuses on the reconstruction of financial items deriving from the management of cash flows in respect of VAT, which is conducted on the basis of the timing assumptions for the management of commercial relations specified in the input sheet.
- The next section is the spreadsheet for changes in net working capital (NWC), which is included in the cash flow account. The annual level of NWC is determined on the basis of parameters that govern the periodic formation of the cash flows indicated by the user in the initial input form.
- The fourth section determines the repayment plan for the debt contracted with institutional bodies, distinguishing between the principal, which remains constant, and the interest. The interest is determined on the basis of the amount of the remaining debt and the interest rate specified in the input phase. As an unchangeable assumption, debt servicing is set by the model as from the first year of the PEF for the interest (so-called initial grace period), while principal repayments start from the first year of operations.
- The fifth and final section creates the profile of the annual repayment instalments on the basis of straight-line modelling over the period. The annual payment is calculated by applying a single, constant rate to the net book value of the assets (namely the value that remains after deducting accumulated depreciation from the value of depreciable assets – expressed net of the subsidy agreed with CIPE): since no analytical treatment of depreciation is envisaged, based on separate rates for each category of assets and their corresponding useful lives, the rate calculated by the PEF can be taken to be the average value resulting implicitly from the depreciation of the set of assets that make up the infrastructure[35]. Since this is a simplified version of a technical-economic depreciation schedule, in the current-prices version neither the amount of the

[34] Compared with previous versions of the application, the "Additional self-financing" line has been eliminated since it is irrelevant in this context.

[35] In the preliminary calculations the PEF compiler may therefore apply, where relevant, the depreciation rate provided for in the Italian Civil Code.

annual depreciation charge or the residual value are adjusted for inflation, as the items are calculated on the basis of the historic cost of the assets.

This section is also used to determine the invested capital that remains at the end of the period. This amount, registered as an input in the cash flow account, forms part of the determination of the profitability of the project and is calculated as the difference between the cost of the investment and accumulated depreciation.

In this respect it should be noted that, in principle, the residual value of an investment only increases the profitability of the project if a end-concession payment is envisaged, for example as a result of the entry of a new concession operator. This does not apply to works to be relinquished without consideration.

The compiler of the PEF must therefore verify that the relationship between the residual value so obtained and the total cost of the investment lies within a range of between 3 per cent and 5 per cent, namely within the margins of international standards.

Figure IV.4 "Investments, Working Capital and Debt Repayment" module

4	INVESTMENTS, WORKING CAPITAL AND DEBT REPAYMENT					
1	Uses and sources of financing					
	counter to:		year 1	year 2	year 3	year 4
	Investments eligible for financing					
+	*Investments in civil works*					
+	*Investments in plant*					
+	*Expropriations*					
+	*Sundry investments*					
+	*Renovations eligible for financing*					
=	**Total cost of investments eligible for financing**					
	Sources of financing for eligible investments					
+	"Private capital"					
+	Total other public grants					
+	Loans from institutions					
+	Grant requested from CIPE					
=	**Total financing for eligible investments**					
	Check					
2	VAT					
-	VAT on investments eligible for financing					
-	VAT on extraordinary maintenance during operations					
-	VAT on other fixed assets and cost components					
+	VAT on sales					
=	VAT balance					
+	VAT refunds					
	Net VAT position					
3	Change in net working capital					
			year 1	year 2	year 3	year 4
	Fee revenues (net of VAT)	customers				
	Ancillary revenues (net of VAT)	customers				
	Cost of raw materials (net of VAT)	suppliers				
	Investimenti in opere e impianti	suppliers				
	Net VAT position					
	Net working capital					
	Change in net working capital					
	Change in net working capital (%)					

continues

continues

	4 Repayment plan for loans from institutions	year 1	year 2	year 3	year 4
	Debt at start of period				
	Disbursement				
(a)	Principal repayment				
(b)	Interest (with grace period interest)				
	Debt at end of period				
(a)+(b)	**Debt service**				

	5 Straight-line depreciation schedule	year 1	year 2	year 3	year 4
	memorandum: structure of depreciation:				
a	Year operation begin				
b	Years of operation				
c	Year operations end (end of PEF)				
d	Year depreciation begins				
e	Year of depreciation				
f	Year depreciation ends				
g=100/e	Annual depreciation rate (%)				
(*)	Residual value				
h	Value of assets (investments net of renovations)				
i	Total public grants				
l=h-i	Initial value of depreciable assets		Undepreciated value		
l/e	Annual depreciation charge				

Source: UVAL

The fifth module contains the *cash flow account*, which represents the "heart" of the PEF. The account has a cascade format and generates gross operating income (GOI: the most basic indicator of current operating profitability) given revenues (both from ordinary operations and from ancillary activities) and operating costs (expressed in nominal terms if the preferred option of drawing up the PEF at current prices has been selected).

Taking GOI, if we subtract income tax for the period – obtained by applying the statutory corporate income tax rate (IRES)[36] to a tax base approximated by net operating income, which is in turn given by the difference between the GOI and the estimate of annual depreciation and finance charges – we obtain *net operating cash flow*.

Subtracting from this last total the investments eligible for financing, extraordinary maintenance and renovation after the construction phase, adding the residual value of the works at the end of the period and deducting the change in working capital, we obtain *net cash flow*. Assigning values to the items necessary for calculating this balance is a minimum requirement for the correct representation of cash flows for the project.

Considering (with a positive sign) the contributions of financial resources, we obtain *cash flow for debt servicing*. This balance is necessary for the calculation of the standard ratios

[36] The Regional Business Tax (IRAP) on the cost of labour and on finance charges is not included for the sake of simplicity.

used in financial practice to evaluate the project's capacity to generate sufficient cash flow to guarantee repayment of financing and adequate profitability for shareholders. By subtracting from the *cash flow for debt service* the flows of interest expense and repayments of the principal (namely, debt service), we arrive at the *net financial cash flow*.[37]

Summing the latter balance annually, we obtain a further indicator of the financial sustainability of the project, namely *cumulative net cash flow:* this is verified if the balance is positive in all the years covered by the PEF. However, a negative balance in the first few years of the PEF may not jeopardise the sustainability of the project if the cumulative cash flow over the term of the PEF is positive, which happens when outlays in the construction years are more than offset by net revenues during the operational life of the infrastructure.

The module also automatically calculates the minimum and average values of two of the most common indicators of bankability: the debt service cover ratio, or DSCR, and the loan life cover ratio, or LLCR[38]. High levels of these ratios suggest that the project can sustain a higher level of debt and, accordingly, require a smaller public subsidy.

[37] It should be noted that during the construction period (therefore before operations have begun) the presence of grace-period interest on any institutional financing and the variation in working capital ascribable to the acquisition of capital goods can give rise to a negative financing requirement. In order to avoid this situation and ensure the presentation of a dynamic financial equilibrium between sources and uses, a closure item has been introduced denominated "*coverage of cash deficit during construction period*" which ensures a zero balance for *net financial cash flow* during the construction phase. The PEF does require specification of the manner in which this imbalance is financed or of the related charges.

[38] The DSCR is the ratio, calculated for every given period of the term of the financing, between the debt service cash flow and the debt service, including both interest and principal. The LLCR is the ratio between the present value of the sum of operating cash flows from the start of the project to the last year of debt repayment, increased by the cash reserve for debt service, and the outstanding debt at the time the calculation is performed.

Figure IV.5 "Cash Flow" module

5	CASH FLOW ACCOUNT

	contatore fino a :		anno 1	anno 2	anno 3
	Cash Flow				
+	Fee revenues (net VAT)				
+	Ancillary revenues (net of VAT)				
-	Administrative costs (net of VAT)				
-	Cost of raw materials (net of VAT)				
-	Staff costs (gross of social security contributions)				
-	Ordinary maintenance costs (net of VAT)				
=	**Margine Operativo Lordo**				
-	#RIF!				
	per memoria: Reddito operativo				
	per memoria: Reddito operativo al netto degli oo.ff.				
-	Imposte sul reddito netto operativo				
=	**Cash Flow Operativo Netto (= MOL-Imposte)**				
-	#RIF!				
	per memoria: valore attuale				
-	Rifacimenti negli anni di esercizio (netti IVA)				
-	Costi programmati per manutenzione straordinaria (netti IVA)				
+	#RIF!				
	per memoria: valore attuale				
-	Variazione del CCN				
=	**Cash Flow netto**				
+	"Private capital"				
+	Loans from institutions				
+	Total other public grants				
+	Grant requested from CIPE				
=	**Cash Flow per il servizio del debito**				
-	#RIF!				
-	#RIF!				
+	Copertura finanziaria sbilanci di cassa anni di costruzione				
=	**Cash Flow Finanziario Netto**				
	Cash Flow Netto Cumulato				

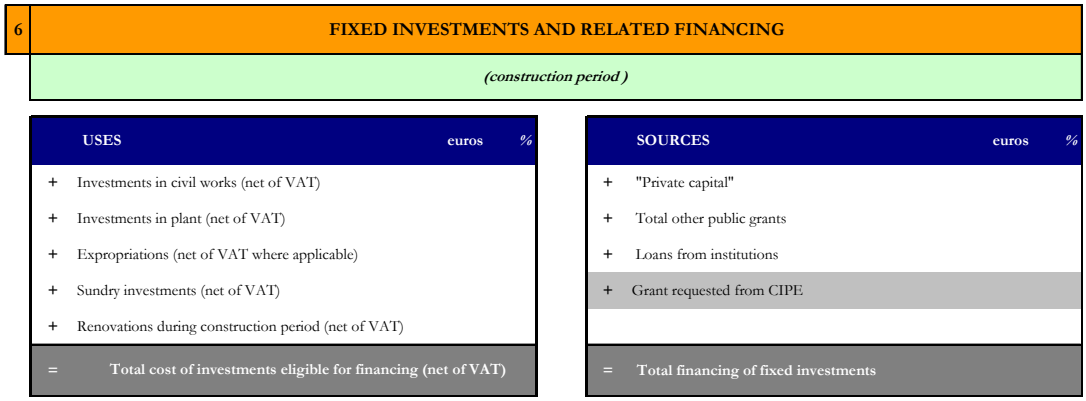
	DSCR - Debt Service Cover Ratio				
	Dato annuale				
	Anni di calcolo (rimborso debito)				
	Minimum (time span: operation)				
	Period of Minimum DSCR				
	Average DSCR				

	LLCR - Loan Life Cover Ratio				
	Semisomma del debito residuo (euro)				
	Dato annuale				
	Anni di calcolo (rimborso debito)				
	Minimum (time span: operation)				
	Period of Minimum LLCR				
	Average LLCR				

Source: UVAL

The sixth module summarises *fixed investments and related financing*. The module provides and aggregate and static overview of the balance between costs incurred in carrying out the investments and the related financing of those investments, including public resources. For expository simplicity, this is expressed as total undiscounted cumulative flows recorded during the construction phase[39]. The table is intended solely to check the balancing of the items associated with the investment.

Figure IV. 6 "Fixed Investments and Related Financing" module



Source: UVAL

The seventh module (*Profitability Measures*) generates the values of the two key profitability indicators used in the discounted cash flows method, namely net present value (NPV) and internal rate of return (IRR)[40]:

a) the net profitability of the project expressed in discounted monetary values, captured by NPV;

b) the IRR, expressed in percentages, is conventionally defined as the interest rate that produces an NPV of zero for the investment.

Both indicators are calculated for the project and invested capital. The indicators for the project express the capacity of the investment to support the costs by creating value through the operation of the works, independently of the composition and amount of the sources of financing, including the grant requested from CIPE. In short, they use the proven "source-independent analysis" approach, which seeks to capture the intrinsic

[39] This version is visible in the annual schedule of outlays registered in the intermediate calculation sheet.
[40] Please see the Glossary of the main terms for formal definitions.

ability of the infrastructure to generate a net gain. They are calculated gross and net of tax on operating income[41].

Conversely, the indicators for invested capital are exclusively financial in nature (i.e., they ignore the items related to the investments, with the exception of the positively-signed residual value). They provide a composite measure of the profitability of non-CIPE financial resources used in the project, profitability that is affected, among other things, by the composition of the sources of funding.

By explicit decision, non-CIPE resources also include those provided by other public entities, such as institutional loans (CDP SpA) or regional funding. For a given gross operating income, plus the residual value of the infrastructure, the profitability of the works will be positively (albeit implicitly) correlated with the amount of the public grant requested from CIPE (which is determined as a residual in the "Operating Assumptions" module).

Accordingly, for a given investment cost, a larger CIPE subsidy means a smaller amount of financing to be deducted from operating income, and therefore higher net profitability for "private" capital. Normally, a public investment project has higher financial profitability than the corresponding project profitability precisely because the cost of funds is lowered by the presence of a non-repayable public grant.

However, an excessively high financial IRR could indicate possible overfinancing of the project, with a consequent "waste" of public funds. Where financial profitability (the financial IRR of invested capital[42]) is greater than that implicitly recognised by the discount rate (set at 5 per cent in real terms), the sponsor of the initiative must justify (in section D of the *Summary Overview*) this divergence on the basis of the specific features of the works in terms of profitability or risk, providing appropriate analytical and empirical support for this position.

[41] Without prejudice to this interpretation, the specific purposes of the PEF counselled the adoption of a variant in which the profitability of the project is calculated net of the public subsidy requested from CIPE. Comparing the two versions provides additional insight into the appropriateness of the amount of the subsidy requested to balance the financing of the project.

[42] IRRs were calculated using the 'IRR COST' formula in MS Excel, with an approximation set at 0.1 per cent, which is generally sufficiently accurate to enable the calculation of the IRR while avoiding indeterminate solutions.

Figure IV.7 "Profitability Measures" module

7	PROFITABILITY MEASURES

		counter to :		year 1	year 2	year 3
		Project Refitability	**Total (nominal figures)**			
	-	Total cost of investments eligible for financing (net of VAT)				
	-	Change in net working capital				
	+	Final residual value				
	+	Gross operating income				
	=	**Project cash flow - before taxes**				
	-	Taxes on net operating income				
check	=	**Project cash flow - after taxes**				

Project IRR - before taxes	
Project IRR - after taxes	
discount rate	
Project NPV - before taxes	
Project NPV - after taxes	

Project cash flow net of grant requested from CIPE - before taxes		
Project cash flow net of grant requested from CIPE - after taxes		

Project IRR net of grant - before taxes	
Project IRR net of grant - after taxes	
discount rate	
Project NPV - before taxes	
Project NPV - after taxes	

		counter to :		year 1	year 2	year 3
		Profitability of invested capital	**Total (nominal figures)**			
	+	Gross operating income				
	-	Taxes on net operating income				
	+	Final residual value				
	-	Debt service				
	-	"Private capital"				
	-	Total other public grants				
check	=	**Cash flow of investment capital**				

Source: UVAL

The eighth and final schedule (*Summary Overview*) summarises the main features of the project, distinguishing between operational information, profitability measures, the structure of financing and the financial return on the investment. The module was designed to facilitate the compilation of the summary PEF to be submitted to CIPE, whose structure it essentially reproduces. The ratio of NPV to the cost of the

investments is determined on the basis of the present values of both terms. Also reported are the average bankability ratios (DSCR e LLCR) calculated in the "Cash Flow" module.

Figure IV.8 "Summary Overview" module

8	SUMMARY OVERVIEW

	B1 - Operational information		Unit of measurement
SERVICE 1	Service delivered (initial level)		
	Service delivered (level in full operation)		
	Unit fee or revenues (first year of operation)		euros
	Unit fee or revenues (full operation)		euros
SERVICE 2	Service delivered (initial level)		
	Service delivered (level in full operation)		
	Unit fee or revenues (first year of operation)		euros
	Unit fee or revenues (full operation)		euros
	Gross operating income (full operation)		millions of euros

B2 - Gross profitability		Unit of measurement
During of PEF (construction + operations)		anni
Total cost of investments eligible for financing (net of VAT)		millions of euros
Costo totale investimenti (netto IVA) - *valore attuale*		millions of euros
#RIF!		millions of euros
Valore residuo finale - *valore attuale*		millions of euros
Valore residuo / costo investimento - *valore attuale*		%
Project IRR - before taxes		%
Project NPV - before taxes		millions of euros (v.a.)
VAN - netto imposte/ Costo Investimento Attualizzato		%

B3 - Structure of financing		Unit of measurement
"Private capital"		millions of euros
Total other public grants		millions of euros
Loans from institutions		millions of euros
Grant requested from CIPE		millions of euros
TOTAL		millions of euros
of which: grant requested from CIPE		*share %*

B4 - Profitability of invested capital		Unit of measurement
Financial IRR on invested capital		%
Financial NPV of invested capital		millions of euros (v.a.)
NPV / invested capital		%

Source: UVAL

V. Applying the PEF to a case study

In order to provide a more practical and – hopefully – effective illustration of the operation of the PEF, we have applied the calculation model to a specific infrastructure investment project financed in part with public funds. This section discusses the main results of the exercise.

Among the relatively few possibilities offered by the information on the financial plans for the works included in the lists of the Infrastructure Framework Law held by UVAL, it was decided to prepare the PEF for a project involving the expansion of port infrastructure.

The project is a "stand-alone" infrastructure, i.e. it is not part of a network system (such as, for example, infrastructure in the water sector or transport networks). This makes it possible – with clear benefits in terms of the conciseness and readability of the case study – to avoid tackling the additional analytical complications generated by the problems of allocating joint costs and additional revenues between existing segments and new infrastructure that arise in the case of network projects.

The example is based on a project that is actually included in the lists of the so-called Strategic Infrastructure Plan (SIP), albeit without adopting all of its financial characteristics. The case study regards the refurbishing of a cruise and commercial port, with the upgrading a ferry dock and services in order to foster the economic and social development of the port, including the tourism sector, with the urban transformation of the port area. The works essentially comprise the renovation of the wharfs.

In order to develop the financial profile of the project, it was assumed that the infrastructure would be used for roll-on/roll-off goods and passenger traffic (RO/RO). The costs and revenues will therefore be generated by two separate services.

The remainder of this section describes the main assumptions used in determining the cost and revenue items. For both, sectoral studies were used to quantify the reference value of the costs and fee income for the two port services involved.

In order make the exercise more complete, it was decided to draft the PEF for the case study at current prices. As the reader will recall, in this case the monetary values of the revenue and cost items are automatically generated by the application on the basis of planned inflation (as specified in the planning objectives announced by the Government in the most recent Economic and Financial Planning Document) for given demand profiles.

The cost items essentially consist of investment expenditure and the breakdown of operating costs.

Investment costs

The total investment was set at €100 million (net of VAT). Construction is scheduled to take 5 years, while the infrastructure will operate for 30 years. The main investments regarded:

- **civil works**, for a total of €22 million;
- **plant,** for a total of €38 million;
- **other investments**, for a total of €40 million.

Engineering studies provide information on the plausible timing of cash outlays for investments in this type of project. Accordingly, it was assumed that the time profile of each of the investment cost components would break down as follows: 10 per cent in the first year of construction, 25 per cent in each of the subsequent 3 years and the remaining 15 per cent in the final year.

Financing

The cost of the investment of €100 million is assumed to be covered by a CIPE grant equal to 40 per cent of the total. The remaining 60 per cent will be financed with third-party capital, of which 20 per cent in the form of equity and 40 per cent with an institutional loan.

Operating costs

Total operating costs are quantified on the base of an estimate of the average unit costs of the two services. These costs are identified with an analytical exercise that produces a single unit value reflecting the different costs of the various port activities, such as landing, mooring, embarking and disembarking, loading and unloading.

Table V.1 Average operating costs by type of service

Services	Average operating cost
RO/RO goods traffic	€20.00/piece
RO/RO passenger traffic	€1.00/pax

Source: UVAL

Using the average unit costs and the traffic volume figures, we obtain total annual operating costs of €1 million.

The structure of operating costs was estimated on the basis of information provided by port authorities and industry operators. The breakdown is as follows:

Table V.2 Cost items

Cost items	Percentage weight
Administrative costs	5
Raw materials	5
Personnel	70
Ordinary maintenance	20

Source: UVAL

Working capital

In order to calculate working capital – and thus its annual changes, the variable that influences net operating cash flow, retaining its algebraic sign – standard assumptions derived from the technical reports of the project were adopted. Customers pay at 30 days, while payments to suppliers for current inputs and investments are made at 60 and 120 days, respectively.

Rate revenues

The fees charged for goods and passenger traffic were drawn from studies conducted by sector experts and represent a proxy for the average price of port services. They are set at €30.00 per piece for goods and €2 per passenger.

In order to forecast developments in traffic over the operational life of the infrastructure, two key variables must be considered. The first is the volume of traffic that the renovation of the port can capture. The second is the growth rate of demand. The estimate of the volume of traffic, which represents the potential demand for

transport, was conducted on the basis of the General Transport and Logistics Plan (GTLP) for 2001. The GTLP forecasts increases of 30.0 per cent and 36.7 per cent for goods and passenger traffic, respectively, between 2001 and 2010.

The forecast for growth in demand for the two services was developed on the basis of simplifying assumptions drawn from information in the original project and updated with the macroeconomic assumptions underlying the GTLP. Specifically, in consideration of the greater capacity available thanks to the new dock, it was assumed that it would be able to capture 36 per cent of the forecast increase in traffic. Starting with the time series for goods and passenger traffic handled by the port, a growth path was generated for the subsequent decade that was consistent with the growth assumptions in the GTLP.

The cumulative growth rate for goods and passenger demand follows the trend derived from the available time series. Taking the ten-year growth forecast in the GTLP as a constraint, the annual growth rates were generated by assuming a gradual acceleration in demand. Initially, the annual rates of growth in goods and passenger traffic are set at 1.0 per cent and 1.14 per cent, respectively, with a consequent annual volume of 90,000 pieces of goods traffic and 1,000,000 passengers in the first year of operation of the new facilities. The gradual acceleration of demand raises the growth rate to 2.2 per cent in the year of full operations, before stabilising thereafter.

The following table summarises the figures used in determining revenues from the services provided:

Table V.3 Fees, traffic and total annual revenues

Revenue items	Fees	Traffic	Total annual revenues
RO/RO goods traffic	€30.00/piece	90,000 pieces/year	€2,700,000/year
RO/RO passenger traffic	€2.00/pax	1,000,000 pax/year	€2,000,000/year

Source: UVAL

Profitability of the project and the investment

The preparation of the PEF enables us to obtain summary quantitative assessments of the real and financial profitability of the project.

The profitability indicators (IRR and NPV) were initially validated through examination of the internal consistency of the levels and changes over time of the items, which, using the "cascade" structure of the accounts and balances, enables us to associate the information on demand, fees and costs with the various definitions of cash flow used to

measure the sustainability and profitability of the infrastructure. The simplified discussion of this examination underscores the advisability of exercising care in conducting this check in the case of a "real" financial assessment of a project.

In the case study, we first considered the rate of change (in terms of annual average compound change) in nominal revenues (3.2 per cent) breaking the overall rate down into the underlying growth in demand (1.7 per cent) and unit fees (1.5 per cent).

It was then found that, owning to the fact that operating costs rise less rapidly than revenues since they are substantially in line with forecast consumer price inflation (1.5 per cent), gross operating income – the main and most direct indicator of operating profitability – should rise faster (3.9 per cent) than revenues.

The significantly slower growth in net cash flow (0.64 per cent) compared with that in GOI is mainly attributable to the impact on cash balances of income tax. Taxes are levied at a proportionate rate[43] on a tax base calculated as GOI, net of finance charges, minus depreciation charges calculated on a straight-line basis at net book value with no inflation adjustment, thereby eroding an increasing share of the operating balance in the transition from the latter to net cash flows, on which the composite profitability indicators are calculated with appropriate accounting adjustments. The main such indicators, for the project and invested capital, are given in the following table:

Table V.4 Profitability indicators

Gross profitability	
Project NPV	-€25.4 million
Project IRR	4.3%
Profitability of invested capital	
NPV	€3.1 million
IRR	7.1%

Source: UVAL

The results of the financial analysis show that regardless of the source of financing the project is not profitable. With an investment of €100 million, the project IRR is lower than the real discount rate (5 per cent) and 1.41 percentage points lower than the nominal rate (6.41 per cent). The project NPV is negative.

Excluding the 40 per cent public grant from the investment, profitability is virtually equal to the nominal discount rate, with an NPV close to zero (minimum requirement for approving/rejecting the project). The return on the private capital invested is good

[43] The rate for corporate income tax (IRES), as the regional business tax (IRAP) was not included among the fiscal parameters of the PEF.

however, as the private portion accounts for only 20 per cent of the investment cost. All the same, the project will not generate sufficient revenues to justify approval.

From the point of view of private investors, the financial analysis shows that with a public subsidy of 40 per cent and private investment of 20 per cent, there would be a strong incentive to undertake the initiative.

Sensitivity analysis

The attractiveness to government of financing the initiative is highly dependent on the amount of grant assumed. In order to determine the optimal amount, i.e. the maximum percentage public grant that would avoid public overfinancing of the project – which would represent a distorted use of scarce public resources – the results of a simple sensitivity analysis are given below.

The analysis seeks to determine changes in financial profitability in relation to different levels of public financing as a percentage of the total. In the initial example, we assumed a CIPE subsidy of 40 per cent. In this case, 20 per cent of the remainder was supplied by private investors and 60 per cent by a government loan.

Without prejudice to the overall indicators of the "intrinsic" (or "source-independent") profitability of the project, we can observe the changes in IRR and NPV of invested capital and the project in response to changes in the public grant[44]. The following table and figure show the values of the indicators as the CIPE contribution varies from 0 per cent to 100 per cent (in steps of 10 per cent).

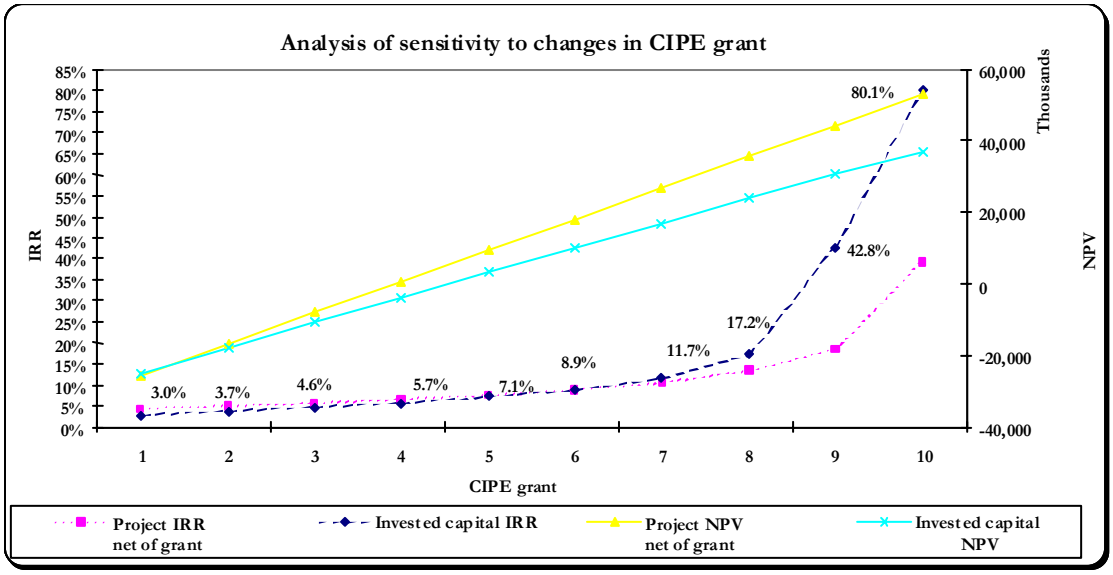
[44] Operationally, while the percentage share of the public subsidy changes, it was decided to leave the relative composition of the other sources of financing unchanged. In other words, the change in the public grant was offset by allocating the residual funding requirement on a proportionate basis between equity and the institutional loan financing.

Table V.5 Analysis of sensitivity to changes in the public subsidy

CIPE percentage grant	IRR of project net of grant	NPV of project net of grant (euros)	IRR on invested capital	NPV of invested capital (euros)
0%	4.28%	- 25,455,008	2.98%	- 25,228,584
10%	4.90%	- 16,745,910	3.75%	- 17,904,462
20%	5.63%	- 8,036,813	4.65%	- 10,731,960
30%	6.49%	672,284	5.72%	- 3,753,772
40%	7.54%	9,381,382	7.08%	3,145,830
50%	8.88%	18,090,479	8.92%	10,045,433
60%	10.71%	26,799,576	11.74%	16,945,035
70%	13.46%	35,508,674	17.18%	23,844,638
80%	18.54%	44,217,771	42.75%	30,744,240
90%	39.20%	52,926,868	80.13%	36,651,440

Source: UVAL

Figure V.1 Sensitivity analysis



Source: UVAL

The analysis shows that the behaviour of the profitability indicators meets expectations. As the public contribution increases, the IRR on invested capital rises since the attractiveness for the private investor (or a public investor who requires a return on its investment) of using resources to build an infrastructure with lower entry costs also rises (precisely because those costs are covered in part by the public subsidy).

However, there is a threshold value for the CIPE grant below which private co-financing of the investment will no longer be attractive and, conversely, above which additional subsidies would represent overfinancing.

This threshold value lies between 30 and 40 per cent, a range in which the IRR on invested capital reaches the nominal discount rate, used here as a proxy for the cost of private capital. For values below this threshold, a private investor would have no incentive to participate in the construction and operation of the infrastructure, while for values above this level public resources would go to waste.

In conclusion, we can reasonably affirm that the CIPE subsidy should be at least 30 per cent of the cost of the infrastructure in order to ensure that once financed it will actually be built.

Appendix: Summary Overview pursuant to CIPE resolution no. 11 of 17 May 2004

Parts A and B of the Summary Overview must be completed in all cases, while parts C and D are to be completed only where the infrastructure could potentially generate revenues (answer "yes" in part B1).

Financial Budget Plan under 2004 Finance Law **(Law 350/03, Art. 4, paragraphs 134 and 140)** **MODEL FORM FOR PRESENTATION OF SUMMARY RESULTS**

PART A: GENERAL INFORMATION ON THE PROJECT			
Name			
Purpose and services provided			
User catchment area			
Financing			
	Thousands of euros	**% of total**	
Total cost of investment		100%	
Public grant requested from CIPE			
Timing of the disbursement of the grant requested from CIPE			
	Year 1	**Year 2**	**Total**
Expected disbursement in thousands of euros			

PART B: POTENTIAL REVENUES		
B1. Assessment Specify whether the infrastructure has the potential to generate revenues from its operation: ☐ Yes: when total annual revenues (fee income and ancillary revenues) from fully operational infrastructure are equal to at least 2 per cent of the total investment cost ☐ No: in all other cases (*If this option is selected, complete part B2*)		
B2. Reasons project cannot potentially generate revenues *Select one or more reason for which, as from the year in which the service delivered with the infrastructure begins, no significant fee or other income can be generated. Provide a brief explanation for each reason selected*		
Reasons	**Select if significant**	**Explanation**
a) Fees or other unit revenues a1) The applicable legislation does not envisage the charging of fees or the generation of other unit revenues from the delivery of the service	☐	
a2) The incompleteness of the institutional and regulatory context (please discuss) does not permit the charging of fees under applicable legislation	☐	
a3) Although the applicable legislation permits, but does not require, the charging of fees, significant socio-economic or technical issues in the reference time horizon (please discuss) make such option unfeasible	☐	
b) Ancillary revenues b1) The technical/economic characteristics of the infrastructure do not permit the generation of any ancillary revenues given the current economic and infrastructure situation	☐	
b2) Ancillary revenues cannot be appropriated by the infrastructure operator (for example, because they regard a still incomplete infrastructure network rather than the individual infrastructure under consideration)	☐	
c) Negligible revenues Although the infrastructure can generate fee or ancillary revenues (please discuss briefly), their total annual amount does not reach the threshold of 2 per cent of the total investment cost	☐	

PART C: TECHNICAL AND FINANCIAL INFORMATION		
C1. Operational information		
INDICATOR	UNIT OF MEASUREMENT	VALUE
(1) Service delivered (level in full operation)	Physical quantity	
(2) Unit fee or revenues (level in full operation)	Euros / physical quantity	
(3) Gross operating income (level in full operation)	Thousands of euros	
C2. Investments and gross profitability (*monetary data should be expressed at present value using a constant 6.5 per cent discount rate)*		
INDICATOR	UNIT OF MEASUREMENT	VALUE
(4) Duration of PEF	Years	
(5) Useful life of infrastructure	Years	
(6) Total investment cost	Thousands of euros	
(7) Final residual value	Thousands of euros	
(8) Profitability indicators: project NPV	Thousands of euros	
(9) Profitability indicators: project IRR	Percentages	
C3. Structure of financing (current values)		
INDICATOR	CURRENT MONETARY VALUES, IN THOUSANDS OF EUROS	% OF TOTAL
(10) Public grant requested from CIPE		
(11) Institutional loans		
(12) Other public funds		
(13) "Private capital"		
TOTAL		100%
C4. Profitability of invested capital		
INDICATOR	UNIT OF MEASUREMENT	VALUE
(14) Profitability indicators: NPV of invested capital	Thousands of euros	
(15) Profitability indicators: IRR of invested capital	Percentages	

PART D: ADDITIONAL INFORMATION

Part D should be completed in the following cases:

a) In all cases where the grant requested from CIPE is more than 70 per cent of the total cost of the project

b) Where the grant requested from CIPE is less than 70 per cent of the total cost of the project and the IRR of invested capital (indicator (15) is greater than the discount rate (the reference rate for measuring the profitability of private investment)

The above cases represent situations in which the amount of financing requested from CIPE appears high upon initial consideration, either in relation to the maximum amount of public financing conventionally adopted at the European level or in relation to the expected profitability of the project.

For such situations, using the following form please specify one or more reasons explaining why it is not possible to finance the project with a larger proportion of non-CIPE grant funding. Provide an accompanying description for the reasons selected.

Reasons	**Description**
☐ **Low profitability of ordinary operations**	*(discuss any causes of low revenues or high operating costs)*
☐ **Financial position of infrastructure operator**	*(specify if the financial situation of the operator affects its ability to raise financing in the capital market)*
☐ **Limited scope for attracting private financing**	*(describe the reasons limiting the involvement of the private sector. In particular, describe the reasons private investors demand a rate of return that exceeds the discount rate for this sector or location)*
☐ **Other (specify)**	

Glossary of main terms used in the Summary Overview

Year of full operation

Generally the year in the PEF time horizon in which the service delivered by the infrastructure reaches its maximum level.

Gross operating income (GOI)

Refers to the income flow from current operations. It is the difference between the value of production and the sum of general and variable intermediate costs and the cost of labour. It therefore represents the margin available for replenishing the physical capital depleted during operations (at the accounting level, depreciation), for remunerating financial capital and for paying taxes. GOI can also be defined as the difference between revenues and the monetary costs of production.

Ancillary revenues

Revenues from the sale of services strictly connected with the ordinary operation of the infrastructure, deliverable from the start of such operations and capable of being appropriated entirely by the infrastructure operator through arrangements such as horizontal integration or sub-concession. They therefore do not include revenues from services that can be delivered only at the completion of works whose construction is carried out in a series of functional lots or which are part of a network structure whose segments are not completed simultaneously. Also excluded are revenues that are not generated by the actual sale of a service but rather take the form of rents from the valuation of intangible externalities.

Fees or other unit revenues

Maximum unit price of the service delivered with the infrastructure, established with an act of the competent authority and stated net of any indirect taxes. It includes any fixed components and components that vary in relation to volumes or other spatial, temporal or qualitative characteristics of the service (such as the type of users, size of area served, continuity or period of supply, etc.).

IRR on invested capital

Discount rate that produces a net present value of invested capital (NPV(k)) equal to zero; i.e. the rate rk that solves the following equation:

$$NPV(k)=\sum_{t=0}^{n} \frac{B_t}{(1+r_k)^t}=0$$

where:

Bt = net cash flow of the invested capital in period t, defined as the difference between gross operating income (GOI), net of taxes (increased in the final year of the PEF by the residual value of the infrastructure, indicator (7)), and the sum – excluding the CIPE grant – of the public and private resources used to finance the project;
n = duration of the PEF

rk = IRR on invested capital

Project IRR

Discount rate that produces a net present value of the project (NPV(p)) equal to zero; i.e. the rate rp that solves the following equation:

$$NPV(p)=\sum_{t=0}^{n} \frac{A_t}{(1+r_p)^t}=0$$

where:

At = net cash flow in period t
n = duration of the PEF
rp = project IRR

This criterion is commonly used in investment decisions: the project is normally approved if the IRR exceeds the cost of capital.

Final residual value

Value assigned to the infrastructure at the end of the period covered by the PEF, calculated as the total cost of the investment less accumulated depreciation.

NPV of invested capital

The net present value of the net cash flows of the capital invested in the infrastructure, defined by the following equation:

$$NPV(k) = \sum_{t=0}^{n} \frac{B_t}{(1+r)^t}$$

Bt = net cash flow of the invested capital in period t, defined as the difference between gross operating income (GOI), net of taxes (increased in the final year of the PEF by the residual value of the infrastructure, indicator (7)), and the sum – excluding the CIPE grant – of the public and private resources used to finance the project.
n = duration of the PEF
r = discount rate held constant over the duration of the PEF (for the purposes of this paper, set in the logarithmic sum of a real rate of 5 per cent and an inflation component, as described in part IV, section IV.2 above).

Project NPV

The net present value of the net cash flows of the project, defined by the following equation:

$$NPV(p) = \sum_{t=0}^{n} \frac{A_t}{(1+r)^t}$$

where:

At = net cash flow in the period t
n = duration of the PEF
r = discount rate held constant over the duration of the PEF (for the purposes of this paper, set in the logarithmic sum of a real rate of 5 per cent and an inflation component, as described in part IV, section IV.2 above).

Useful life of the infrastructure

Period of time – not necessarily the same as the time horizon of the PEF – over which the infrastructure is capable of delivering a service with an adequate level of productive efficiency and qualitative effectiveness.

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Annexe no. 4
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