

GLOPRAM

The Global Project Assessment Model

A new tool to bridge the gap between Cost-Benefit Analysis and budgetary decisions

Summary

1 Introduction

Job creation, economic growth, territorial attractiveness and competitiveness... The soft and hard infrastructure's¹ benefits are undeniable and investing in it is essential to meet today's and tomorrow's needs. In France, no less than one in five jobs is related to infrastructure². Despite its critical importance in economic development, investments in it are far below what it is needed and are decreasing. Over three decades, the investments in telecommunications and transportation infrastructure fell from 2.2% per year between 1970 and 1979, to 1.3% in 2006 of the French GDP. In 2018, the total inland infrastructure investment represented 0.8% of the French GDP (source: OECD³). The difficult assessment of their medium and long-term budgetary impacts can explain these phenomena. The GLOPRAM aims at evidencing the budgetary consequences of a project⁴, considering the infrastructure's short and long-term impacts to help the actors better select projects and measure the negative impact of the lack of maintenance.

2 What is the classical infrastructure project selection method?

The common method used during the decision-making process for the infrastructure's feasibility is the Cost-Benefit Analysis (CBA). It assesses the socio-economic aspects of the project, by allocating costs and benefits to each stakeholder, respectively the users, the population, the private partner(s), and the State (or local community). Following the socio-economic analysis, an environmental impact is conducted. Usually, it considers costs and benefits related to climate change, air pollution and ecosystem services. Those elements differ from one infrastructure to another and require detailed analysis for each project. The outcome of this CBA analysis will determine whether the project is desirable or not for the country.

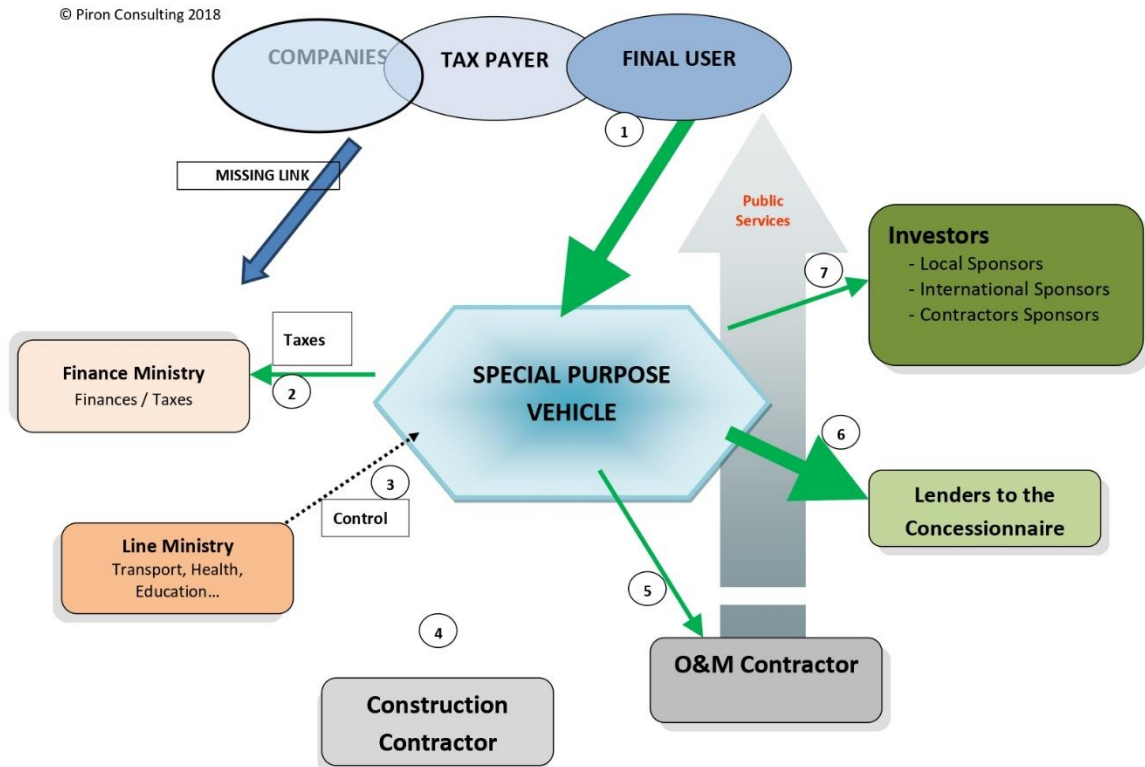
Despite the widely spread usage of CBA, its main limit is that the analysis stops just before the full budgetary impact assessment. As a result, evaluations systematically consider the expenditures without the revenues and thus predict a deterioration of the debt-to-GDP ratio, a lower financial net present value and do not consider the return on investment that the project could achieve for the State (or local community), in other words, the project's fiscal sustainability, which consequently reduces the volume of investments. Therefore, a new evaluation method considering the full fiscal impacts of the project (positive and negative) would better reflect the reality of future fiscal outflows and inflows.

GLOPRAM evaluates the value of the "missing link" of the project, through which companies and taxpayers generate money to the Consolidated Public Accounts, compensating eventually the initial investment cost. The graph below shows that for a project implemented through a commercially viable concession contract the State receives money from the economic activity generated by the project (blue arrow called "Missing Link") and does not pay anything to the private partner.

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User-funded contract: CONCESSION: OPERATION PHASE



3 GLOPRAM presentation

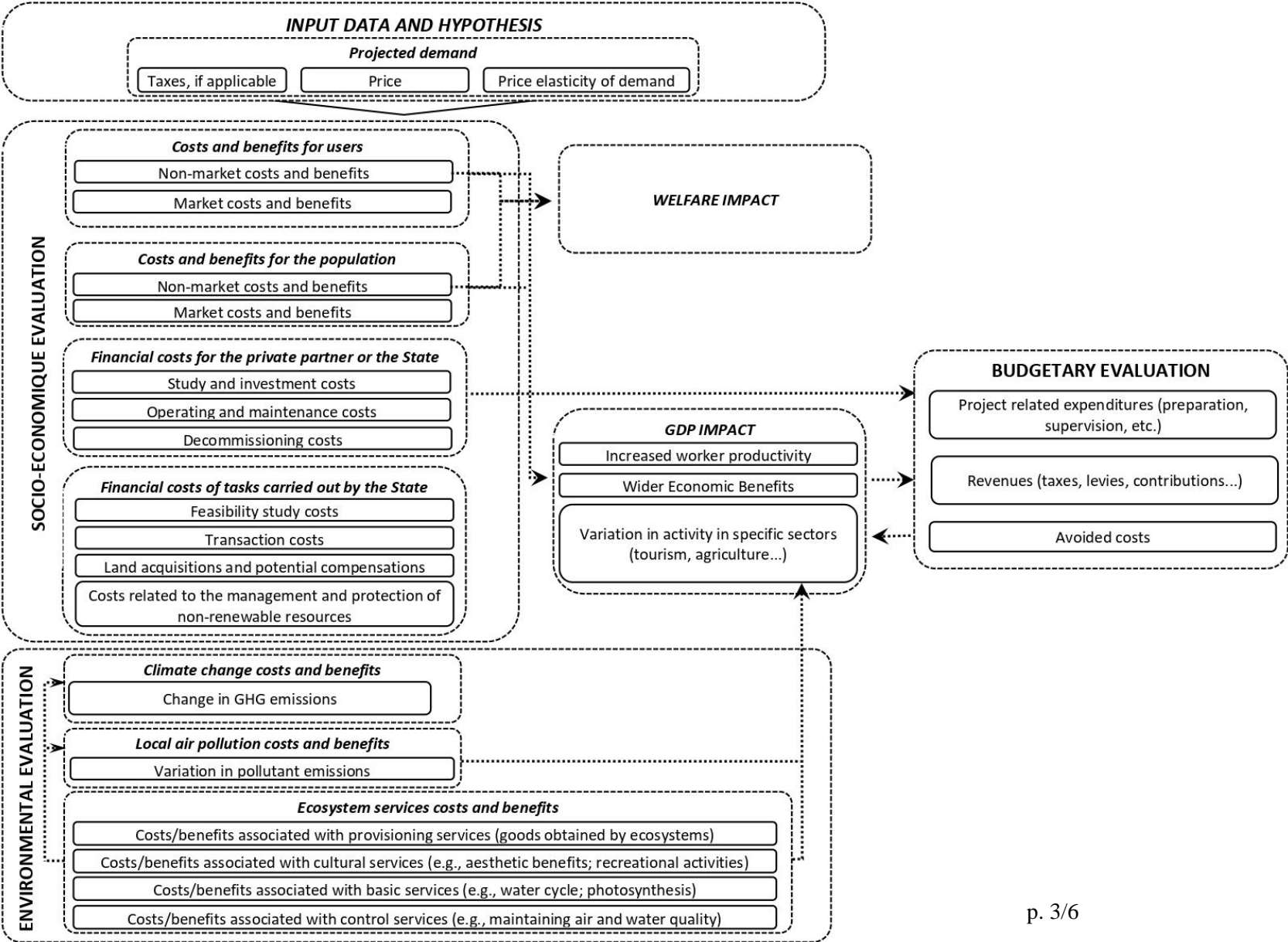
The GLOPRAM project was born out of a joint initiative between Jeanne Amar, lecturer at the University of Côte d’Azur and Vincent Piron, economy and transport specialist. The GLOPRAM was first released in the GREDEG Working Papers series (working paper 2020-55).

The Global Project Assessment Method (GLOPRAM) reconciles the socio-economic assessment, the environmental impact study, and the budgetary impact of a project. Its main originality is the provision of an overview of future budgetary flows for the State, including both revenues and expenditures (*see GLOPRAM’s general structure*).

The GLOPRAM needs the following entries:

- Functional description (production, capacities, number of users, etc.);
- Process and pricing level;
- Environmental impacts (positive and negative);
- Relationship between the project and the increase in GDP that it causes (variation in tourism, agriculture, increased worker productivity etc.);
- The social impacts;
- The country’s budgetary parameters (public borrowing rate, unemployment rate, social security contributions, etc.);
- Financial parameters of the project (project owner's borrowing rate, debt tenor, duration of contract, debt/equity ratio, sources of funding);
- Investment, routine and heavy maintenance, and operating costs.

Figure: General structure of the GLOPRA



The GLOPRAM computes the following outputs:

- Annual budget flows according to the type of contract;
- Trend in the debt/GDP ratio;
- Choice of the type of contract according to the specific constraints of the State and local communities.

The GLOPRAM method allows a fairer evaluation as it includes future cash-flows and gives more perspectives about it. Indeed, it is crucial to expose both the costs and revenues borne by the State and local communities, along the project’s life, as it can completely change the project fiscal impact and thus better meet the needs of infrastructure.

4 Example: Highway infrastructure

Highway length: 5.5 kilometers

Construction cost: EUR 146 million (excluding VAT)

Period of the project: 23 years – 3 years of construction and 20 years of operation.

Toll-free highway financed by the public (taxpayer)

Table 1 – Transportation costs and benefits to users and the population (non-exhaustive list)

	COSTS		BENEFITS	
	Market	Non-Market	Market	Non-Market
For users	Change in vehicle operating costs Toll (if applicable) Taxes (if applicable)			Time saving Comfort improvement Reliability improvement
For the population				Decongestion of alternative roads Improved security Reduction in noise pollution Job creation

Traffic forecasts, costs and benefits to users, safety benefits, construction and operating costs, volumes of pollutant emissions were derived from the public inquiry file, in accordance with the European Union recommendations. We also assume that the project will generate Wider Economic Benefits – a 7% increase in conventional benefits (from Douglas & O’Keeffe 2016). For the budgetary evaluation, expenditures and revenues were based on the French tax system.

After computing the data in the GLOPRAM 2020 method, the following forecasts were produced, in the case of a toll-free highway financed by the public budget:

Table 2 – Comparison of Net Present Value⁵ (NPV) for the State budget with and without fiscal revenues; traditional financing, toll-free highway (in thousands of euros).

The NPV with fiscal revenues⁶ is significantly higher than the NPV without fiscal revenues. Without fiscal revenues, the NPV declines over time, while the NPV with fiscal revenues increases and, in this case, becomes positive after 20 years of operation. This result emphasizes that the time horizon of project evaluation strongly influences the results. In this example, the total costs are fully offset by fiscal revenues. For a set of projects, this fact has already been recognized by the IMF in its macro-economic studies (see for example IMF’s World Economic Outlook (2014)).

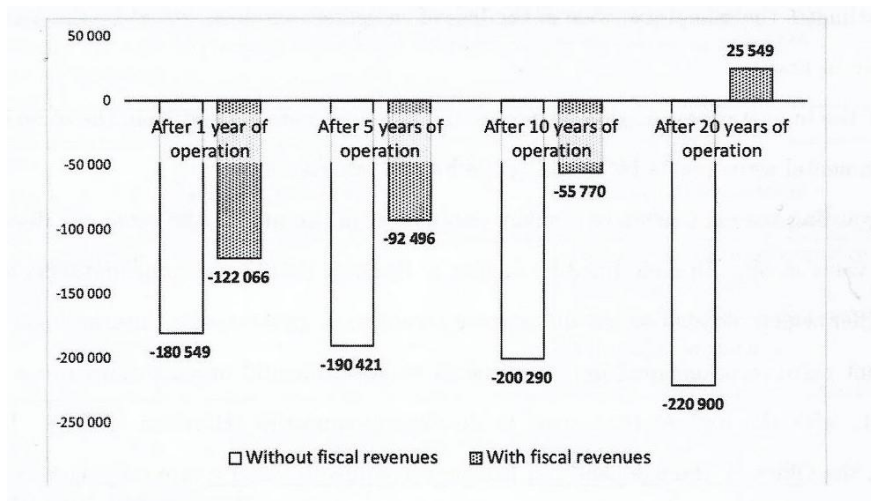
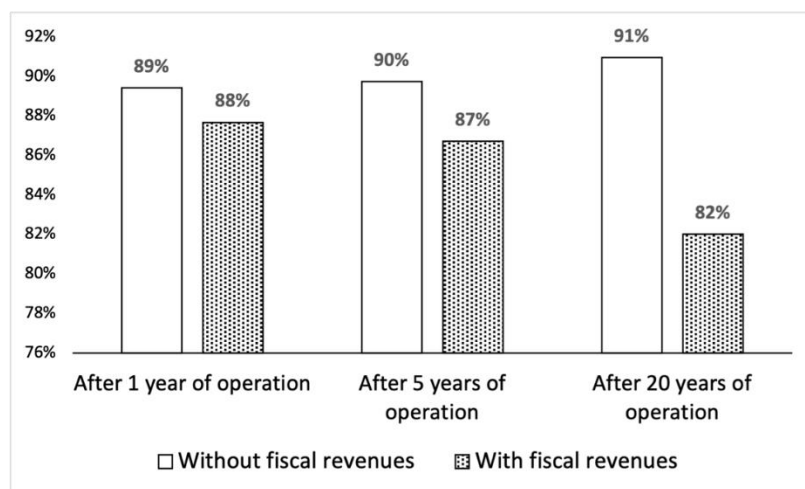


Table 3 – Forecast Debt-to-GDP ratio; traditional financing, toll-free highway (in thousands of euros). For these forecasts we assume an initial ratio of 100% and an investment representing 5% of the GDP.

Often expressed as a percentage, the Debt-to-GDP ratio can also be interpreted as the number of years needed to pay back the debt.

Here again, the inclusion of fiscal revenues in the budgetary evaluation is decisive since the debt-to-GDP ratio is much lower when fiscal revenues are taken into account. In the short term, the improvement in the debt-to-GDP ratio will be noticeable. In the long term (20 years), the new infrastructure, because of its dynamic effects, stimulates economic activity and considerably reduces the State’s level of public debt in comparison with its GDP.



The previous tables demonstrate that considering fiscal revenues in the infrastructure assessment is crucial, as it shows a quicker capacity to pay back the debt and higher project profitability.

5 GLOPRAM's outcome

The GLOPRAM is a tool that facilitates the decision-making for public and private investment choices. This method is a neutral indication of the social, environmental, and economic expenditures and returns an infrastructure will generate over time. It computes costs and benefits estimates and forecasts the payback period.

In conclusion, the GLOPRAM is an instrument that helps prioritize the different infrastructure projects and contractual procedures according to their budgetary sustainability.

¹**Infrastructure:** A set of facilities and equipment needed by a community e.g. roads, airports, telecommunications, swimming pools, schools, hospitals (source: French dictionary).

²in 2017, according to the INSEE, the active labor force was of 29,7 million people (from 15 years old) in France. 5.439 million jobs are related to infrastructure (industry & construction), according to FNTP and INSEE.

Calculation method: cross product.

<https://www.insee.fr/fr/statistiques/3676643?sommaire=3696937>

https://www.fntp.fr/sites/default/files/data/fntp_vademecum.pdf

³<https://data.oecd.org/transport/infrastructure-investment.htm>

⁴The GLOPRAM analyzes the return on investment of non-market infrastructures.

⁵**Net Present Value:** NPV is used in capital budgeting and investment planning to analyze the profitability of a projected investment or project.

⁶**Fiscal revenues:** Total tax and nontax revenues of governments and all public bodies.