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The relations among financial and economic aspects in the evaluation of infrastructures 1 (Marco Ponti – Francesco Ramella)

1. Two financial variables have a strong impact on economic evaluation of infrastructure. The first one is rather well known, and is the marginal opportunity cost of public funds (MOCPF), that varies from country to country and from period to period.
2. The second is also well known in theory, but seldom seen within a CBA context: is the pricing policy assumed for infrastructure financing, that can vary from full investment cost recovering (average cost pricing, or ACP) to partial recovering, to zero recovering (short term marginal cost pricing, or MCP).
3. Furthermore, these two financial variables are interlinked: in general, ACP pricing policies are more consistent with a high MOCPF.
4. The paper shows these relations in quantitative terms, and derives some policy recommendations, and areas for further research.

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The relations among financial and economic aspects in the evaluation of infrastructures 2 (Marco Ponti – Francesco Ramella)

5. Some history: at the World Bank it was assumed that budget constraints were dealt with at macro level, and CBA was the only issue at play. Bonnafous defined instead an effective and simple bottom-up approach, while MOCPF is a top-down one (see MIT guidelines). The European Commission is rather vague on this problem, mostly assuming a World Bank approach

6. The Keynesian issue: a **positive** MOCPF, and the difference between A.V. and CBA analysis, not well defined even in literature. Some research is going on with the Commission on a similar issue (GDP impacts).

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The relations among financial and economic aspects in the evaluation of infrastructures 3 (Marco Ponti – Francesco Ramella)

7. The interplay of tariffs, elasticity, MOCPF and ENPV is a complex one. For each project we have assumed an external MOCPF (for example, given by the central administration, variable tariffs in order to test the impact of the financing policy on the ENPV of the project, i.e. it economic feasibility

8. Demand elasticity plays also a crucial role here: in case of a very high elasticity of demand to tariff, the financing policy (ACP versus MCP) has an high impact on ENPV: higher tariffs generate large losses of demand, lowering the economic benefits of the project. The “classical” trade-of between economic efficiency and ACP emerges again, but in a new light: projects with rigid demand can pay a largest share of the investment costs with lower surplus losses.

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The relations among financial and economic aspects in the evaluation of infrastructures 4 (Marco Ponti – Francesco Ramella)

9. But this is only one aspect of the problem: the lower the tariff, i.e. the higher is the need of state subsidy to the investment costs, the higher the surplus loss due to the MOCPF.

10. But now we have a generalized instrument of surplus optimization of the pricing policy, linked with the (exogenously given) MOCPF, and the demand elasticity (specific of each project).

The following is the general formula linking the main variables at play

$$ENPV = \sum_{t=0}^{T} \frac{\left(b_{unit} * T_{r_0} - \frac{T_{r_0}}{e * \frac{P}{dP}}\right) - C_t}{(1+i)^t} - \frac{CF_t - P\left(T_{r_0} - \frac{T_{r_0}}{e * \frac{P}{dP}}\right)}{(1+i)^t} K_{(1\ldots2)}$$

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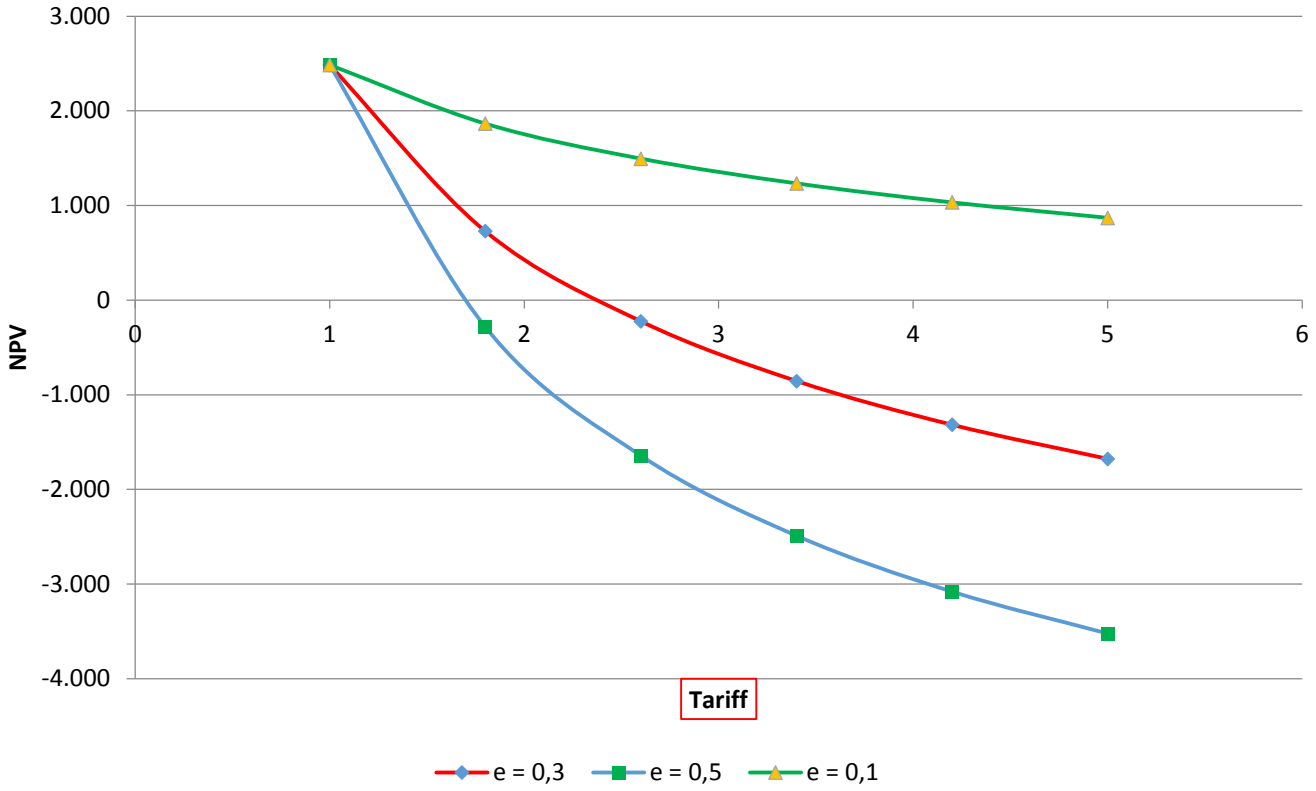
The relations among financial and economic aspects in the evaluation of infrastructures 5 (Marco Ponti – Francesco Ramella)

This is a graph showing the role of two of the main variables: elasticity and tariff on ENPV



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