CERIS : Civil Engineering Research and Innovation for Sustainability

Essays on prioritization and portfolio selection of investment in large-scale public infrastructure in Angola

Summary

Angola is often referred to as a resource-rich country. Massive infrastructure investments have been executed in recent years. Nevertheless, the general panorama of the public infrastructure is still critical. Unsurprisingly, the national development plan (NDP) recognizes that the prioritization of the public agenda is too centralized, inhibiting its wide public acceptance and appropriation. But today, the country faces the "train dilemma": investments in infrastructure entail massive financial resources, not only because it is underprovided but also due to high rates of population growth and urbanization; and at the same time, its primary source of financial resource – fossil fuel production – is highly exposed to the rapid global decarbonization trend and the low-carbon growth model. The current public investment ranking and selection model, in force for over a decade, allegedly favors imprecise decision-making. It is assumed to fit the post-conflict reconstruction scenario, as it rewards short-term or reactive and emergency objectives.

As sustained by the World Bank (1994), infrastructure is an area in which government policy and finance have an essential role because of their pervasive impact on economic development and human welfare.   Due to its impregnable multidimensionality, public infrastructure, especially large-scale (LSPI), requires the conciliation of many points of view and substantial financial resources. The main objective of this essay is to contribute to developing a comprehensive LSPI prioritization and portfolio selection aiding model, enhancing public goods and services provision and, as a consequence, public expenditure quality. Purposely, it uses the MCDA - applying preference modeling – with Portfolio Decision Analysis (PDA) approaches to build an integrated decision-aiding model with the intervention of the public policy decision-making process (DMP) primary stakeholders. Decision-aiding context (DAC) description, the policymaking process (PMP), and infrastructure value-focused thinking are intentionally presented, giving rise to a broader family and subfamily of criteria. Applying the revised "Pack of Cards" method, the importance of each criterion will be defined.

Other preference parameters will be elicited through co-constructive procedures with the participation of the main stakeholders. Exploiting MCDA-ULaval Software, the model will be constructed. LSPI potential alternatives will be evaluated and categorized into priority implementation levels according to their performance in each criterion. Then, using a linear programming model with budgetary and other relevant constraints, the optimal selection and composition of the portfolio will be carried out. The results will be validated through robustness analysis. Models' practical implications in the DAC will be analyzed.

Keywords

Large-scale public infrastructure, prioritization and portfolio selection model, public policymaking process, MCDA-preference modelling, portfolio decision analysis.

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