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# VALUATION OF INFRASTRUCTURE PROJECTS: A REVIEW OF THE LITERATURE ON THE APPLICATION OF THE REAL OPTIONS APPROACH.

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**Introdução**

Infrastructure projects are vital for the economic development of countries and to fulfill the needs of society (Cavallo & Powell, 2019; Grimsey & Lewis, 2002). These projects, however, are subject to numerous risks and uncertainties. Traditional valuation methods do not capture the value of managerial flexibilities that are commonly embedded in these project and thus may provide incorrect estimates of their value. Therefore, flexible approaches are required for their evaluation. There are many works in the literature that address the use of ROA for this class of projects.

**Problema de Pesquisa e Objetivo**

Although the literature related to the use the Real Options for the valuation of infrastructure projects is extensive, the published reviews only provide a fragmented view of the field. In general, most papers do not perform a detailed review of the literature and are limited to specific aspects of the ROA valuation. Hence, this article aims to present a more comprehensive review of the works that use ROA to evaluate infrastructure projects. This review includes papers that model government supports as options.

**Fundamentação Teórica**

Real Option Approach (ROA) allows incorporating flexibility in managerial decision-making and to capture the impact of the uncertainties and the value of these flexibilities. Recognizing flexibility allows managers and decision-makers to quickly adapt investment projects to changing environments and conditions (Garvin & Cheah, 2004). These flexibilities can reshape the project to maintain its profitability (Kozlova, 2017), mitigate risks and uncertainties, take advantage of opportunities and avoid pitfalls.

**Discussão**

This review shows a growing trend to publish papers addressing the use of ROA in the valuation of social infrastructure projects. It is noted that these works address real-world problems, primarily concessions in developing countries. The bulk of the research in the field is mainly focused on the analysis of the transportation network infrastructure. The main uncertainty modeled is the market demand and the most widely used valuation techniques are the Monte Carlo simulation and the Binominal lattice model.

**Conclusão**

The reviewed papers illustrate the importance of ROA in the valuation of infrastructure projects. Our findings show a tendency to analyze the effects of using more than one option. Researchers seek to study how one type of option can affect the value of another option. It is clear that there is still much to be done and future research could address the analysis of other types of infrastructures and model multiple uncertainties. We also recommend studying and evaluating other types of government support.

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