

# **Cost of Capital Estimation for Energy Sector and Regulatory Risk in Brazil**

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## **1. Overview**

This paper describes Internal Rate of Return (IRR) estimates that have been driving recent infrastructure auctions and tariff revisions for public utilities in Brazil, commonly based on estimations for the required cost of capital, measured by WACC – Weighted Average Cost of Capital. Considering that the gap between Return on Investment Measures (like ROE and ROIC) and WACC consists on a major impediment to boost private participation in Brazilian infrastructure projects, the main goal of this article is to investigate both the evolution of such measures and, on a regulatory risk perspective, what factors are behind the wedge described. It will be seen that there are a wide range of assorted models for different regulated sectors in Brazil – a variety of assumptions that applies to one particular sector does not for others and there is a whole lack of standards regarding sources of data used. Besides this lack of standardization, some cases are described and evidence from the literature support the existence of risks due to regulation in Brazil – the most remarkable one related to the energy sector. As a continuation of this research the results obtained will be compared, on a sector by sector basis with international references, aiming to establish an index that relates the quality of regulation with the cost of capital.

## **2. Methodology**

In order to analyze the differences among the various regulated sectors in Brazil concerning to cost of capital estimation, it will be used the most advanced techniques of Corporate Finance field applied to Regulation as well as Econometrics, attempting to assess if the choices made by regulators are consistent. It will be seen that there are significant differences even when only the energy sector in Brazil is considered. The proposed estimation for transmission auctions by ANEEL is a good recent example - information from NTN-B's (Brazilian inflation indexed government bond) is used to estimate risk free rate –this parameter's distribution is obtained from US Treasury bonds (10-year duration), a common procedure in the related literature and among practitioners in finance industry.

## **3. Expected results**

Comparisons with other countries to establish an index that relates regulatory quality and cost of capital will be made, beginning with a survey where a comparison among required rates of return and cost of capital estimates - ROE x Ke and ROIC x WACC – will be performed. In spite of the focus on energy sector, data will be collected for a variety of sectors and countries, including Latin America, countries comparable to Brazil and more developed ones.

As preliminary results, there are huge evidence that, in Brazil, different methodologies for estimating cost of capital for regulatory purposes coexist, with diverging versions of CAPM model, different data sources and assumptions. This lack of standards may be related with the Brazilian current situation, characterized by the absence of clear rules and a sensitive regulatory risk, mainly on energy sector, where firms are experiencing difficulties.

#### **4. Conclusions**

This project aims to make a comparison among the various existing practices for estimating cost of capital due regulatory purposes in Brazil. In a later stage of the research, the intention is to identify the effects on this parameter of some factors such as the quality of the guarantees established. Given the situation currently experienced in Brazil, in which regulatory risks are perceived, this work has potential to provide important information for policy makers and private sector organizations interested on those investments.