## The common risk factor of regulation

**Overview**: Literature related to cost of equity has been evolving substantially since the Capital Asset Pricing Model development. The inclusion of new variables in order to capture distinct exposure to the systematic risk, such as market capitalization and momentum raised important questions associated to anomalies and consistency of CAPM. Besides its relevance, the regulatory factor remains overlooked and it seem to be not entirely captured by any of the already included factor variables in the traditional CAPM.

Theoretical regulatory literature provides ambiguous arguments of the effect of regulation on the cost of equity of regulated firms. On one side, regulation would reduce firms' exposure to systematic risk due to the predictability of tariff readjustment and due to the almost inelastic demand of utilities services. On the other hand, the aforementioned readjustment process is an important source of risk since it is slow economic crises, for instance. Also, other source of risk is associated to the legal uncertainty related to regulator capacity and power to intervene and alter contractual terms. For instance, in Brazil, federal government decreed the Temporary Law 579/2012 and Law 12.783/2013, changing some contractual terms to renew electricity generation and transmission concessions. Overall, our objective is to answer the following question: Does the regulatory risk exist?

The empirical evidence related to the regulatory risk is also not consensual. The divergence, though, is associated to the institutional environment where the sample firms are headquartered. Some papers evidence that beta in American capital market decreases as the regulation becomes more severe. On the other hand, other papers evidence the existence of regulatory risk in Brazil. Albeit the authors conclude that the electricity industry is one of the most exposed to such risk, the ANEEL (Brazilian Electricity Regulator Bureau) does not include this factor in the estimation of the cost of equity of regulated firms during tariff readjustment process. In this sense, these firms would be underpaid and so would be firms from other harshly regulated industry.

**Methodology**: Related literature in Brazil usually uses traditional CAPM under the premise that market beta is able to capture properly all the regulatory risk. However, Brazilian capital markets suffer from liquidity issues that affect the stocks return variance and, consequently, the beta estimation. Due to these methodological issues, the existent evidence provides weak results and conclusions.

Facing this gap in the regulatory literature, the present paper intends to develop an empirical model employing the Fama and French (1993) and Carhart (1997) approaches, using sample comprised by Brazilian publicly-traded firms during the 1999-2017 period. In this sense, our objective is twofold. Firstly, we aim to capture a common risk factor to regulated firms. Secondly, we intend to verify whether this factor increases the explanation power ($R^2$) to the traditional and the subsequent CAPM models.

**Results and Conclusions:** Our results suggest that regulatory factor is an important element to explain the stock returns of regulated firms, increasing the explanation power to the traditional and the subsequent CAPM models. This paper contributes to the regulatory literature providing new information to support the policy makers and promoting debates related to regulatory environment in Brazil. Our methodology could be extrapolated to other countries where regulatory mechanisms are similar to the Brazilian one. Last but not least, our paper contributes to the finance literature adding a new systematic risk factor to CAPM, enhancing its consistency and viability.

**Bibliography**

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