

The interplay of climate policy and electric sector deregulation: the perspective of firm's investment strategy in renewable energy

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Overview

There is a long-standing interest in the policy impacts of both climate policy and electric sector deregulation. Energy economists argue market deregulation and political risks of decarbonization may undermine investment incentive (Joscow, 2013; Newbery, 2018). While, some scholars state that combining market reform and a carbon price could achieve significant rates of decarbonization (Teng, 2017). However, the empirical evidence of the interplays of these two policies is rare. Also, most prior studies investigate the topic from the policy-maker or regulator perspective and lack the perspective of firm managers and investors. Firms response policy differently and set up investment strategy based on their technology preference (Shoai-Tehrani et al. 2018), ownership structure, firm size, market position, technology capability, financial capacity and market competition etc. Neglecting the firm strategic responses to policies may lead to policy failure and even cause welfare loss as a result. This paper highlights the interplay of climate policy and sectoral deregulation by empirically examining the firm's renewable investment behaviors. The research grounded in the resource-based view (Barney, 1991; Lavie, 2006) suggests that firms adapt to a changing environment by reconfiguring the resource portfolio. The impacts of climate policy and sectoral deregulation on firms' investment decisions can be observed by investigate the firm resource redeployment.

Methods

Our empirical context is the world's electricity generation segment. The choice of entry into renewable generation and the share of renewable energy in a firm's electricity generation mix are considered to be two indicators of firm renewable energy investment strategy. The explanatory variables are climate policy package and deregulation policy package in country/state level. We include the electricity demand and developing/developed country dummy to control country heterogeneity. The technological controls include the cost of renewable energy and renewable potentials. The firm package includes firm ownership, market competition, and firm size to control firm heterogeneity and current portfolio to indicate path-dependence and technology preference. In this study, the time lag between investment decision and operation of a plant is also considered. Also, as the stability of policy and the credibility of government may also affect the expectation of firms and their investment behaviors, we add the credibility and stability indicators of policy in this research.

Data

We aggregate the database of world power plant at the firm level. The database includes 38173 energy-related firms and 219232 power plants that they own. The examining period is from 1990 to 2017. That makes 1030671 firm-year observations. The deregulation package is compiled from academic literature while the climate policy package is compiled from CD-links current policy database and the climate database of New Climate Institute.

Conclusions

We investigate the firm investment strategy on renewable energy with the largest database of the world's electricity generation. Our empirical results unfold the heterogeneity of firm strategic responses to climate policy and electricity deregulation. The interplay of climate policy and electric sector deregulation is also examined. The study can contribute to the effective policy design to motivate firm investment in the low-carbon technology deployment.

References

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