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THE EFFECTS OF REGULATORY FRAMEWORKS ON ELECTRICITY SUPPLY SECURITY: A EUROPEAN ANALYSIS

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Overview

This paper analyzes the effects that the introduction of market regulation has had on the reliability of the European electricity system. The period under consideration here, 1999 to 2010, was characterized by significant reorganization in the electricity market structure accompanied by improvements in electricity supply security in most European nations. Many national governments have implemented regulatory schemes specifically governing the energy market. In this paper we test the hypothesis that the existence of a rate of return, or output (quality) based regulatory framework significantly improves the level of electricity supply security *vis a vis* a purely incentive based scheme.

Methods

We employ data from the Council of European Energy Regulators (Council of European Energy Regulators, 2012) on the System Average Interruption Duration Index (SAIDI) of 22 European countries alongside various explanatory variables in a longitudinal framework. Our econometric model then estimates the effect that each regulatory scheme has on supply security using a group fixed effects approach, with the fixed effects specified at the group (multi-country) level to increase within variation and identify the coefficients of interest.

The prevalence of reverse causation (i.e. that regulatory regimes exist due to certain levels of supply security) is tested by means of an instrumental variable approach, which is elaborated in the paper.

Results

Results indicate that using an output (or quality) based regulatory framework will decrease annual outage durations by $20.7 - 27\%$ *vis a vis* an incentive-based system, especially when appropriate investment incentives to utilities are ensured.

This is disaggregated in the paper in order to allow for a thorough discussion of the driving factors of regulation in terms of electricity supply security.

Conclusions

Given significant economic costs of power outages (see Reichl et al., 2013), even marginal improvements of supply security have considerable economic benefits. This information helps regulatory bodies understand when to consider imposing quality controls. We argue that quality controls ought to be considered in any new European regulatory regime, as they can lead to significant economic benefits from improvements in supply security.

References

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