

Restructuring and reliability in the electricity industry of OECD countries: Investigating causal relations by econometric model

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Overview

Security of supply tends to be assigned a quite high priority on the national energy policy agenda. To date, reliability issue topping the agenda of policy makers in most OECD countries is related to restructuring which is proceeded with purpose of improvement of efficiency. To investigate relations between restructuring and reliability in the electricity industry of OECD countries, we approach the value chain of the power supply : resource access, generation, transmission&distribution and electricity imports. Reliability is evaluated by index of each sector. Finally, we result the causal effects between type of restructuring and four sub sectors.

Methods

Before assessing the effect of restructuring of power sector on supply reliability, supply reliability itself and the level of regulatory reforms are assessed first. For this purpose, for each of the four sectors of electricity supply structures, an indicator suitable for quantitatively evaluating supply reliability is selected and measured; resource important dependency, reserve factor, transmission and duration of unplanned disturbance and electricity import share. Criteria for quantitatively evaluating electricity industry restructuring, too, are selected ; entry liberalization, privatization and vertical divestiture. With these variables, we use econometric model, especially fixed effect model, to investigate causal relations between restructuring and reliability in the electricity industry of the 15 OECD countries from 1987 to 2007.

Results

Restructuring exerts effects in different directions depending on the sectors and exerts effects with different degree of statistical significance. According to the result of this research, restructuring, which is designed for improving competitiveness, has predominately adverse outcomes, especially on domestic electric supply structure. In the case of privatization, it is shown to undermine supply reliability for the sectors of resource, transmission and distribution, and electricity import. As entry liberalization is observed to have a negative causal relationship with reserve factor, which signifies supply reliability, the research attests a negative effect of an increase in competition as part of restructuring on a steady provision of energy supply. Positive causal result exhibits only on the relationship between entry liberalization and electricity-import dependency.

Conclusions

According to results, restructuring of electricity industry is generally negative to the reliability of power supply whereas it differs by the type of liberalization and each supply sector. Increasing number of competitive firms by entry liberalization have lack of incentives to build up the new or additional capacity. Privatization make conflicts of operating purpose results from the ownership change from public to private entity.

References

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