

# ***THE EFFECT OF PROCURING ELECTRICITY IN-HOUSE ON UTILITY'S PERFORMANCE : EVIDENCE FROM THE U.S. ELECTRIC UTILITY INDUSTRY***

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## **Overview**

Does procurement of electricity in-house (i.e. vertical integration between retail and generation) increase or decrease utility's performances such as profits and costs? The utilities must decide whether they should procure electricity internally or from the outside such as wholesale market for their retail and delivery service. Although this issue has attracted many practitioners in the electric industry for years, little work has been done on it in the academic field. It can be attributed to the fact that the central controversy in the electric industry was the third party access to transmission networks and hence researchers paid little attention to the relationship between retail and generation. However, along with the liberalization in the electric industry, a lot of nonutility generators and retail service providers have emerged in the electricity market, which expanded the utilities' strategic options regarding the way to procure electricity. And hence it is a good time to consider the relationship between retail and generation.

This paper empirically examines the effect of procuring electricity in-house on the utility's performances. This strategic decision can be analysed by applying transaction cost economics (TCE). TCE provides pros and cons of procuring electricity in-house. The advantage of procuring electricity in-house is that it leads to cost efficiency when 1) the transaction between generation and retail needs specific investments, 2) the transaction between generation and retail is complex and 3) the transaction environment is uncertain. On the other hand, procuring electricity in-house might plague utilities with bureaucracy costs such as agency costs and influence costs. Utilities will be efficient if the benefit of procuring power in-house outweighs its cost.

We focus on performance indicators such as Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA), and operation, maintenance and administrative costs (O&M costs) in the electricity segment of U.S. investor-owned utility companies providing the bundled service (i.e. retail and delivery service) in 2010-2015.

## **Methods**

Our primary source of data is operating company level from Form EIA-861. EIA-861 reports annual activities for each operating utility. It collects information on annual sales, revenues, the amount of electricity generated in-house and purchased from outside suppliers, and their activity status of generation, transmission, distribution and sale of electricity for them. We also collect information on utilities' financial performances such as EBITDA and O&M costs from FERC Form 1. Merging these two data source, we construct a final dataset, which includes 129 investor-owned utility companies (in 2015) providing the bundled service (i.e. regulated retail service). The dataset has 607 observations in an unbalanced panel in 2010-2015. We use fixed effect model of panel data analysis. Our empirical specification regresses utility's performances such as EBITDA and O&M costs on its extent of the procurement of electricity.

## **Results**

First, the effect of in-house procurement on utility's O&M costs depends on the uncertainty in the transaction. When the transaction environment is uncertain (stable), the utility could reduce the O&M costs by the internalization of procurement (using outside suppliers) rather than using outside suppliers (the internalization of procurement). Furthermore, this tendency can also be observed in the average O&M costs.

Second, utility's profitability measured by EBITDA is not affected by the way to procure electricity. This result might be specific to our data setting. As mentioned above, this paper focuses on IOUs providing the regulated retail service (i.e. bundled service). Because the price of the bundled service is based on the costs level, the price tends to be higher (lower) when the cost is higher (lower). Hence, from the first result, the internalization of procurement leads to decrease (increase) in the average retail price when the transaction environment is uncertain (stable). Furthermore, we find that the difference between these movements is small. Thus, we can predict that the price-cost

margin of the bundled service is unchanged regardless of the utility's decision of whether or not to procure the electricity in-house. This means that profit is unchanged. Incidentally, sales volume is also not affected by the decision of whether or not internalizing the transaction.

## Conclusions

The effect of in-house procurement on utility's performances depends on the uncertainty of the transaction environment. The O&M costs of the utility internalizing procurement are lower (higher) than that of utility procuring electricity outside when the transaction environment is uncertain (stable). In addition, because the price of the bundled service is based on the costs level, the price tends to follow the movement of the costs. This means that price-cost margin is unchanged and hence, profit is also unchanged. Although our findings is not attracting for IOUs providing bundled service, they have an important implication for the social aspect. That is, in-house procurement increases the consumer welfare by the price reduction without losing producers surplus (i.e. profit) when the transaction environment is uncertain. On the contrary, when the transaction environment is stable, in-house procurement increase the costs and hence the retail price, which would harm consumer welfare.

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