

AN ANALYSIS ON PRICE FORMATION IN TURKISH ELECTRICITY MARKET

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Overview

High price volatility occurs in the electricity market due to many factors such as supply and demand imbalances, increasing demand, and transmission constraints. As a result of price fluctuations in the market, price risk arises. In this case, understanding of the factors influencing price formation is important in order to effectively manage price risk and remain in the business. In this study, main driving factors affecting price formation in Turkish electricity market have been evaluated and in this context, some proposals have been made for policymakers and the energy regulator.

This paper is organized as follows. Following the introduction section, the second section explains the methodology of the paper. The third section outlines a brief history and basic features of the Turkish electricity market, including the legal framework and market design. The fourth section introduces factors influencing price formation in the electricity market. The fifth section makes a detailed analysis of factors. The sixth and final section concludes the paper and provides suggestions to policymakers and the energy regulator.

Method

In this paper; the effects of natural gas price, the Brent oil price, exchange rate and water volume on the formation of electricity price were measured. Day Ahead Market (DAM) price is used as the electricity price in the market. A data series from December 1, 2009 until March 1, 2014 is used. Correlations in the data series were calculated using EViews and Microsoft Excel.

Results

According to the results, there is no significant relationship between electricity prices and selected parameters. Correlation between water volume and electricity price is calculated to be -0.62. This shows that there is a weak and inverse relationship between the two variables.

Table 1. Correlation between electricity prices versus selected parameters.

	Brent oil price (US\$/Barrel)	Exchange rate (US\$/TL)	Day Ahead Market price (TL/MWh)	Natural gas price (TL/Sm ³)
Brent oil price (\$/Barrel)	1.00	0.55	0.13	0.56
Exchange rate (\$/TL)	0.55	1.00	0.38	0.78
Day Ahead Market (TL/MWh)	0.13	0.38	1.00	0.29
Natural gas price (TL/Sm ³)	0.56	0.78	0.29	1.00

Table 2. Correlation between electricity price and water volume.

	Water volume (million m ³)
Day Ahead Market Price (TL/MWh)	-0.62

Conclusions

Natural gas price, the Brent oil price, and exchange rate of US\$/TL have no significant effect on the electricity price formation in Turkey. There is a weak and inverse relationship between the price of electricity and water volume.

The results show the dominant position of the state owned generator in the price formation in the market. Delay in the liberalization of the natural gas market is another driving factor in the electricity price formation even though Turkey has met almost half of the electricity production from natural gas.

In order to provide price signals for the investor, Turkey has to privatize state owned generation capacity and liberalize natural gas market.

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