Dynamic Effects of Supply and Demand on Electricity Prices during the Global Energy Crisis: Evidence from Japan

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The electricity market is characterized by kinked supply and demand curves. However, how these features affect price dynamics in response to supply and demand shocks has not been fully explored.

To investigate the effects of supply and demand on electricity prices, we use high-frequency data from the Japanese wholesale electricity market (JEPX) to analyze the impulse responses of electricity prices on supply and demand shocks before and after the global energy crisis.

Our results show that the price response to demand shocks declines, whereas the response to supply shocks increases during the crisis period. These patterns are consistent with an upward shift in a kinked supply curve and an inward shift in a kinked demand curve.

A complementary structural vector autoregression analysis indicates that the persistent elevation in electricity prices has been driven by supply shocks, while demand shocks have partially offset this upward pressure.

Overall, the results highlight the exposure of electricity prices to international fuel market conditions and underscore the roles of demand and supply shocks in electricity price dynamics.