***The impact of market expectations on supply elasticity and price volatility in the German-Austrian day-ahead electricity market***

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## Overview

## This paper aims to explore the link between market expectations generated by electricity producers and price volatility. We empirically examine how non-renewable electricity producers adapt their bids to produce electricity based on their market expectations, especially those related to variable renewable energy (VRE) production and total demand. In a first step, we find that this bid adjustment impacts the elasticities of the supply curve. In a second step, we find that market supply's elasticity constitutes a new path through which VRE generation affects price volatility.

## Methods

Based on micro-data of the day-ahead aggregated supply curves for the German/Austrian market (EPEX Spot) from 2011 to 2018, we compute for every hour the main regions' elasticities along the supply curve. Using a fixed-effect model, first, we find the impact of production and demand on supply elasticities. In a second step, we examine the effect of these elasticities on the realized day-ahead price volatility.

## Results

We find evidence that when non-renewable producers expect a rise in VRE, their willingness to increase production decreases −i.e., the market supply elasticity becomes more inelastic− as they expect a fall in the residual demand. In contrast, when they expect an increase in total demand, their willingness to expand their production increases −i.e., the market supply elasticity becomes more elastic− as they expect a rise in the residual demand. Additionally, our research finds that an increase in elasticity decreases price volatility. As a consequence, it follows that an increase in expected VRE increases volatility. In contrast, an increase in expected demand reduces volatility.

## Conclusions

Our research concludes that contrary to what economic theory indicates, producers adjust their production based on fundamental variables and their market expectations. Actually, our research shows that market expectations are catalytic factors for price volatility. Furthermore, our research finds that the supply curve's elasticity constitutes a new path from which VRE generation impacts price volatility. Previous literature explains the impact of renewables on price volatility via the *merit order effect* and *intermittency effect*. However, our research shows that VRE generation also impacts the shape of the supply curve and, in turn, price volatility. Our results are significant to model price volatility and, therefore, of fundamental importance to market participants who seek to hedge for a potential risk in the electricity market.