How do OPEC announcements affect oil prices and volatility?

Executive Summary

This dissertation investigates how announcements by the Organization of Petroleum Exporting Countries (OPEC) affect crude oil prices and volatility, focusing on three decision types: production cuts, production increases, and no-change announcements. Using daily spot prices of Brent and West Texas Intermediate (WTI) from 2002 to 2025, the study applies an event study methodology combined with GARCH, EGARCH, and TGARCH models to capture both returns and volatility dynamics. Ordinary least squares and quantile regressions are then used to examine how these effects differ under varying market conditions.

The analysis reveals three key findings. First, OPEC announcements consistently trigger asymmetric market reactions. Production cuts, which theory suggests should lift prices, often lead to declines, as markets interpret them as signals of weak demand or broader economic instability. Conversely, production increases are sometimes associated with rising returns, reflecting expectations of stronger demand rather than oversupply. No-change announcements generally have limited impact, consistent with being anticipated by the market.

Second, much of the volatility surrounding OPEC announcements is anticipatory. Spikes in volatility are observed in the days leading up to meetings rather than on or after announcement days. This pattern points to the importance of market expectations, speculation, and potential information leakage. GARCH models confirm that negative shocks disproportionately drive volatility, with EGARCH providing the best statistical fit for both benchmarks.

Third, Brent and WTI respond differently. Brent, as the global benchmark, exhibits stronger and more persistent reactions to production cut announcements and is more sensitive in calm market conditions. WTI, by contrast, shows sharper pre-announcement responses, especially around production increases, reflecting the role of speculative trading and regional market frictions. Quantile regression results confirm that both benchmarks react more strongly during periods of high uncertainty, but Brent is more consistently influenced across all volatility regimes.

Overall, this study demonstrates that OPEC's influence operates less through direct supply control and more through its signalling effect on market expectations. For investors and risk managers, the results highlight the need to account for asymmetric reactions and predictable pre-announcement volatility when pricing derivatives or hedging exposure. For policymakers, the findings emphasize the importance of credibility and transparency in OPEC communication, as markets often respond more to perceived signals than to actual production changes.

The dissertation contributes to ongoing debates about OPEC's role as a cartel, swing producer, or signal sender. It shows that the organization's impact is neither uniform nor mechanical but filtered through market conditions and benchmark-specific dynamics.

Understanding these nuances is critical for navigating the risks and opportunities of global energy markets.