NATURAL GAS SALT CAVERN STORAGE COST PREDICTABILITY

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Overview

This paper examines the costs of injecting and withdrawing natural gas from salt cavern storage facilities. Salt caverns are primatily used for serving peak load demand as they offer high deliverability, in both injection and withdrawal processes related to natural gas. Many short term traders use salt cavern storage to maximise profits by arbitraging differences in price from seasonal demand. It is generally acknowledged that injection costs increase in storage facilities as storage levels are high and withdrawal costs increase as storage levels diminish. Recently, demand for natural gas storage has declined due to decreased seasonal price spreads in response to a growth in supply from US shale sources and demand which recently has lagged supply. This has led to a dearth of investment in new gas storage capacity. Forecasts, however, predict that demand for storage capacity will increase in the next few years, mainly in response to US LNG exports (Hua, Anthony and Frank 2016). This demand will put pressure on exising storage capacity. Comprehension as to how storage, injection and withdrawal costs respond to increased demand for storage is essential to understanding natural gas pricing.

Methods

Generalized Method of Moments Estimation.

Results

I find that injection costs will increase asymptotically as storage levels near maximum capacity. This will put enormous pressure on price when storage demand is increased in the future and will lead to new incentives to invest in gas storage capacity.

Conclusions

The theoretical and empirical results suggest that there will be upward pressure on natural gas prices as storage costs increase in response to heightened demand for storage. Using storage to reduce the volatility of natural gas and seasonal price spreads will become more costly as more gas is injected into storage.

Bibliography

Hua, Fang, Ciatto Anthony, and Brock Frank. *U.S. Natural Gas Storage Capacity and Utilization Outlook.* 19 July 2016. https://energy.gov/sites/prod/files/2017/01/f34/U.S.%20Natural%20Gas%20Storage%20Capacity%20and%20Utilization%20Outlook_0.pdf (accessed May 4, 2017).