STUDYING BOOM-BUST CYCLES IN NATURAL GAS PRODUCTION ASSETS INVESTMENTS

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IAEE's 2016 conference, 28-31 August 2016, Baku, Azerbaijan

Key words: natural gas markets, news investment-specific shocks, agent-based modeling, path-dependence, dynamic disequilibrium, irreversibility, boom-bust cycles.

Abstract

During the past decade, the global natural gas market has witnessed a series of critical upheavals: increasing market volatility, greater geopolitical risks, ever-growing hazardous market cycles,... In this disrupted environment, the use of models capable of representing the genuine dynamic of gas market fundamentals has become decisive for the gas industry to generate the most reliable long-term forecasts. However, conventional natural gas models usually neglect the effects of dynamic path-dependence and independent agent behaviours by assuming that the market stands in a permanent state of equilibrium.

The new model therefore aims at exploiting these two disregarded concepts to represent the natural gas market as an evolving and complex system. To this end, the new approach consists in building the dynamic path resulting from the progressive realisation of the natural gas market with an advanced rolling optimisation model.

In accordance with the principle of causality, the non-coordinated an irreversible investment decisions in natural gas production assets made by independent market players at a given date have a direct and structural impact on the market configuration over the following years. Associated with a thorough representation of the progressive depletion of existing natural gas resources, the model may lead to market conditions which deviate from equilibrium. More specifically, the model can exhibit endogenous boom-bust cycles characterised by a succession of oversized expansion periods followed by critical contraction periods.

The aim of this new rolling model is to help decision makers in the natural gas sector to better assess incoming risks and opportunities by providing them with the most likely market forecasts rather than with market forecasts fulfilling ideal but not realistic market conditions. Beyond this specific application, this innovative approach could be readily applied to oil or power fundamental models.

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