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RELEVANCE OF RISK CAPITAL AND MARGINING FOR THE VALUATION OF POWER PLANTS: CASH REQUIREMENTS FOR CREDIT RISK MITIGATION

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OVERVIEW

In the electricity sector, most of the trades are still done in the OTC market without direct mitigation of credit risk. Newer discussions fuelled by the European Commission (EUCOM 2009) show that there is a political will to enforce a stronger collateralization policy on all European derivatives markets, including the OTC markets. This is meant to secure the markets and prohibit arbitrage on regulatory regimes as a consequence of the financial crisis. However, collateralization does not come for free. In our study, we analyze the capital needs for margining for coal and gas power plants as well as for outright power based on commodity prices of 2007-2009 in conjunction with the clearing rules for margining of the European Commodity Clearing AG (ECC).

METHODS

As a starting point, we determine the expected load factors for the years 2009 and 2010 per plant. Assuming that the resulting generation volume would have been known in the years before, we apply different hedging strategies to calculate the open positions that would have had to be covered with collaterals. Moreover, we consider netting possibilities between short and long positions in accordance with the ECC rules. Second, we determine – on the basis of empirical data – the major impact factors on the total margin requirements with respect to different hedging strategies. Also, we show the differences between the fuel types and the correlation of margining requirements vs. the underlying commodity price developments as well as technical parameters. Finally, we analyze in which way the mitigation of credit risk with margining has to be recognized for investment decisions or, more generally, for the management of financial resources of utility companies. Especially the last part may impose restrictions on a company, e.g. when the overall financing liquidity in the market is reduced (as it could be seen during the financial crisis in 2008 and 2009) or rating-related restrictions – e.g. fulfilling ratios for debt-to-equity or net debt vs. EBITDA etc. – impose additional restrictions on a company.

RESULTS

Based on the set-up of our analysis, we show that in absolute terms especially outright power has quite significant cash needs for trading, whereas coal- and gas-fired power plants have less than half the needs of outright power. In relative terms for the fossil-fired power plants, we find that coal-fired power plants have a relative advantage in comparison to gas-fired plants. The need for risk capital per MWh_{th} of coal-fired power plants is comparably lower.

CONCLUSIONS

Coal plants have a relative advantage with regard to the needed risk capital for credit risk mitigation in comparison to gas-fired power plants. A major reason for this is the notation of the coal price in US-Dollars/metric ton. Generally, the absolute price change for coal in the notation US\$(or €)/metric ton is higher than the absolute price change in US\$(or €)/MWh, for example for gas. However, as one ton of coal contains approx. 7 MWh of thermal energy, the relative price change for coal in US\$(or €)/MWh in comparison with the absolute price change in US\$(or €)/MWh for gas is significantly lower.

Our calculations show the dependency of this result on the efficiency of the two plants. The higher (lower) the relative delta between the efficiency of the coal- vs. gas-fired power plant is, the higher (lower) is the absolute difference between the change in the variation margin for coal vs. the change in the variation margin for gas.

We find that a further advantage for a coal-fired power plant compared to a CCGT is the difference in the so-called Additional Margin requested by the ECC. As of today, the additional margin for gas is over two times as high as the additional margin for coal.

For further details, please download the full length working paper at:

http://www.eonerc.rwth-aachen.de/aw/cms/website/zielgruppen/fcn/Publications_FCN/ablage-struktur/~/uyh/Relevance_of_Risk_Capital_and_Margining/?lang=en

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