

ENERGY MARKET DERIVATIVES CLEARING – IMPLICATIONS FOR FINANCIAL STABILITY

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Abstract: The study explains the interactions between energy prices and financial stability by analyzing the organization of power and gas derivatives clearing in Europe. Quantitative and qualitative analysis of clearing house's collateral composition fluctuations, particularly during the 2022 energy crisis, allowed identifying considerable challenges to managing both the liquidity and counterparty risk stemming from the process of commodity clearing. Cointegration techniques were also used to run a sensitivity analysis of the required margin calls and default fund contributions. Findings confirm procyclicality of collateral requirements and the fact that their level may become very problematic to manage by both energy companies, their clearing banks and the central counterparty itself.

Keywords: CCP, clearing, power derivatives, gas derivatives, financial stability

INTRODUCTION

The 2022 energy crisis triggered by Russia's invasion of Ukraine has driven energy prices to unprecedented levels and put a lot of pressure on companies forced to live up to the collateral requirements stemming from power and gas derivatives clearing by central counterparties (CCPs). Studies to date have explored the implications of high energy prices to consumers and competitiveness of European economies, yet the strain on energy trading and CCP liquidity has not been broadly analysed. This study attempts to address this gap through analysing changes to the size and composition of the CCP funds as a consequence of gas and power price surge on exchanges cleared by European commodity clearing (ECC) and Izba Rozliczeniowa Giełd Towarowych (IRGiT). The aim is to quantify the liquidity risk brought about by significant volatility on the energy market and borne by the CCP, as well as determine whether it can pose a risk to financial stability.

The study builds on the logic presented in studies by Aldasoro et al. (2023), as well as King et al. (2023), yet focuses on the clearing houses serving transactions in power and gas derivatives in Europe. The aim is to evidence the risks to financial stability stemming from energy derivatives clearing at times of high electricity and gas prices. Main source of data are public disclosures by the two clearing houses in the EU, the German-based ECC and Polish IRGiT. They have been selected for the analysis to study the different composition of collateral managed by the two entities and implications this may have to financial stability. In particular, the feedback loop between the required size of collateral and rising price levels will be studied in detail to evaluate the impact on counterparty and liquidity risk. In order to run a sensitivity analysis of this sort, key variables governing the size of margin calls and default fund contributions will be tested for cointegration. This approach is similar to the one proposed by Brunetti et al. (2022). In addition, comparisons between maximum estimated payment obligations held by a CCP and the size of readily available funds will be made to verify the size of exposures particularly at times of high energy prices.

Results indicate that collateral requirements for trading, particularly on regulated markets within the understanding of MiFID II, can result in major liquidity risks at times of high energy prices. Consequently, these requirements can result in companies refraining from trading as they find themselves unable to live up to the increased margin calls. This confirms the increased interdependence between the energy and financial market and the difficult position of the CCPs in securing the interests of buyers and sellers without becoming directly exposed to default risk of any of them.

METHODOLOGY

The study builds on a number of contemporary research papers explaining the growing role of central counterparties in modern world of finance (Domanski et al., 2015; ESMA 2022; Truchet, 2023), the risk they manage and threat they bring to financial stability (Aldasoro et al., 2023; ECB, 2023; King et al., 2023), as well as discussion papers highlighting the challenges brought about by energy derivatives clearing (Furtuna et al., 2022; BIS, 2023; FSB, 2023). Literature studies signal that few studies thus far have studied the interplay between commodity market CCPs, energy companies and clearing banks and the impact these interactions may have to financial stability. In particular, analyses thus far do not discuss the profound differences in the forms of collateral accepted by regulated CCPs such as the European Commodity Clearing and less regulated Organized Trading Facilities (OTFs) such as Poland's Izba Rozliczeniowa Giełd Towarowych. This study attempts to fill this gap, through analysing the publicly available data on the funds operated by the clearing houses, evidencing the consequences of procyclicality of margin calls, as well as quantifying the fluctuations in liquidity risks alongside variations in the underlying commodity prices.

Apart from traditional data analysis building on the CPMI-IOSCO Public Quantitative Disclosures files published by both ECC and IRGiT, the study develops a sensitivity analysis exploring price levels of electricity and gas that might have a spill-over effect on the liquidity of both companies directly involved in commodities trading and their clearing banks. Considering the limited (quarterly) granularity and availability of data on the size of margin call and default fund contribution sizes, such sensitivity analysis is built on cointegration models, tested following the approach by Phillips (2016) to address the problem of short time series. The research period was defined for the years 2018 to 2024 and was constrained by the availability of CPMI-IOSCO disclosures by the CCPs. Nonetheless, the period is thought to cover the most crucial dataset from the perspective of this study, capturing the period of considerable volatility of electricity and gas prices on European markets.

FINDINGS

Study confirms that collateral requirements may be difficult to manage by all the stakeholders involved in energy derivatives trading, including the energy companies, clearing banks and the CCPs. These problems manifest themselves in the company's inability to engage in further trading due to collateral constraints, major liquidity gaps recorded by the CCPs being forced to be "elastic" in policing their own mark-to-market rules, as well as acceptance of higher credit risk exposures by banks supporting companies trading in energy derivatives. This is particularly the case for stakeholders engaged in trading on regulated markets within the understanding of MiFID II as there are few types of non-cash collateral that can be accepted. The "margin spiral" phenomenon is also confirmed, with long-run relationships signalling the procyclicality of collateral requirements that put further pressure on companies forced to keep up with major price fluctuations on the electricity and gas markets. Historical size of margin calls and risk concentration levels disclosed by the CCPs analysed also signal that a default of a major energy companies might be very difficult to handle by the central counterparty and potentially also by the financial system as a whole. This can be particularly the case for OTFs when the list of accepted collaterals includes assets which can prove to be severely illiquid.

CONCLUSIONS

Study evidences the growing interdependence between the energy commodity markets and financial stability. While the two EU CCPs have proved to be remarkably resilient during the 2022 energy crisis, they have become exposed to significant risks that could threaten their business continuity. Strict collateral requirements helped limiting this exposure, but at the same time they have limited the counterparty's ability to continue trading at the time of major electricity and gas scarcity throughout Europe. This also shows that striking the right balance between financial stability and collateralization-related costs of trading is a remarkably difficult task, that has forced the authorities and CCPs to be flexible about following the rules on supplementing the margins.

Study limitations stem primarily from unavailability and low granularity of data on the resources and cash flows of CCPs. This naturally stems from commercial sensitivity of transactions cleared but makes it very difficult to study the dynamics of day-to-day changes in margin levels and default fund contributions, which collectively are the main source of short-term liquidity risk borne by sides to transactions concerned.

The results signal that companies trading on regulated markets are facing far greater challenges in terms of collateralization of transactions in energy derivatives. At the same time, they make it clear that the level of stability warranted by regulated markets can be far greater than OTFs, which enjoy far greater flexibility in terms of determining the forms of accepted collateral. This would suggest that perhaps OTFs should be constrained in terms of accepting collateral that could not be activated soon enough to serve closing of positions of a defaulting clearing members. In addition, although the results confirm that collateral requirements on both OTFs and regulated markets are characterized by inherent procyclicality that exaggerate the liquidity risk at times of extreme commodity price levels, it is unlikely that this problem can be addressed without having a negative effect on financial stability.

Future studies could focus on estimating and analysing the size of short-term financial flows between the CCPs and clearing members, as this is the key source of liquidity risk that needs to be managed by both the energy companies and the financial institutions. Authorities dealing with ensuring financial stability could also explore state interventions that could help bearing the burden of collateralizing trades in electricity and gas at times of price spikes, thereby ensuring business continuity.

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