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Analysis of the traded volume drivers of the Iberian power futures market

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ABSTRACT

A comprehensive assessment of the liquidity development in the Iberian power futures market managed by OMIP ("Operador do Mercado Ibérico de Energia, Pólo Português") in its first 4 years of existence is performed. This market started on July 2006. A regression model tracking the evolution of the traded volumes in the continuous market is built as a function of 12 potential liquidity drivers. The only significant drivers are the traded volumes in OMIP compulsory auctions, the traded volumes in the "Over The Counter" (OTC) market, and the OTC cleared volumes in OMIP clearing house (OMIClear). Furthermore, the enrollment of financial members shows strong correlation with the traded volumes in the continuous market. OMIP liquidity is still far from the levels reached by the most mature European markets (Nord Pool and EEX). The market operator and its clearing house could develop efficient marketing actions to attract new entrants active in the spot market (energy intensive industries, suppliers, and small producers) as well as volumes from the opaque OTC market, and to improve the performance of existing illiquid products. An active dialogue with all the stakeholders (market participants, spot market operator, and supervisory authorities) will help to implement such actions.

1. Introduction

Since its beginning on July 3, 2006, the Iberian power futures market managed by OMIP, within the framework of the Iberian Electricity Market ("MIBEL"), has experienced a continuous development, in terms of number of participants, number of trades, traded volumes, aggregated open interest and smaller bid-ask spreads. At the end of June 2010, 39 market players participated in OMIP. Nineteen of them belong to Iberian vertically integrated energy groups. The most populated group, if excluded the vertically integrated energy companies, is composed of 11 energy traders. Only nine members are pure financial agents, still a reduced figure [1]. The main amount of traded energy in OMIP has been driven by *compulsory call auctions* according to national regulations aimed at employing such auctions as a transient mechanism to foster the liquidity of the continuous market managed by OMIP. The five largest Spanish distribution companies have been obliged to purchase in these auctions until July 2009, in order to partly cover their portfolios of end-user regulated supplies. Likewise, the Portuguese last resort supplier kept that obligation until July 2010. Description of the main features of the MIBEL derivatives market during its first 2 years of existence can be found in [2]. That research focused on the analysis of the price efficiency by means of the *ex-post forward risk premium*. Furió and Meneu [3] define the premium as the difference between the average settlement price of a futures contract and the resulting average spot price during delivery. Energy markets show limited levels of market efficiency and the behaviour of OMIP futures prices does not differ much in terms of price efficiency compared to the most mature European power derivatives markets [2].

The current research analyzes the efficiency of the Iberian power futures market focused on another cornerstone: liquidity. The employed data set is robust, as it covers the first 4 years of existence of this market (from July 3, 2006, to June 30, 2010). Such an ample data set facilitates the detection of the most significant traded volume drivers and on the other hand, the identification of the products that still show poor performance (i.e. illiquidity). These findings allow the formulation of policy recommendations for streamlining the efficiency of this market. A regression model using Ordinary Least Square methodology is estimated to assess the effect of 12 selected drivers (the independent variables) for the following key liquidity measure (the dependent variable): the evolution of the energy traded in the continuous market. The research is also reinforced by means of a correlation analysis of the independent variables with the dependent variable. As market players trade essentially energy derivatives to hedge their supply commitments [4] – in the case of electricity suppliers, such hedges through forward contracting are established to secure their retailing margin [5] – the analysis of the traded volume drivers allows to determine if the Iberian power futures market is growing properly to consolidate its original role as key hedging vehicle. Other typical liquidity measures, suggesting potential research for further

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analysis of this relatively young market, are the bid-ask spreads [6], the open interest [7], the volatility and sensitivity of prices to additional demand [8], and the resilience [9]. The term resilience, whose original use comes from Physics, is widely used in other scientific areas, as Finance – related to the robustness of the financial institutions or even the whole financial system [10]. In the case of liquid energy markets, prices must be resilient to large orders [9]. In the Iberian power futures market, the resilience is mainly secured by the market regulation, as the market operator establishes maximum price variation limits. The orders exceeding such limits cannot be matched [11]. Additionally, The Spanish Energy Commission (*Comisión Nacional de Energía*, CNE) performs weekly monitoring of the evolution of the power futures prices and the OTC prices, by means of charts of OMIP settlement prices and OTC weighted average prices [12]. As deviations between the values of both price series are not usual, the resilience is also found in the OTC market, strengthening the forward market integrity.

The article is structured as follows: (i) Section 2 performs a literature review of relevant studies regarding liquidity of energy markets; (ii) Section 3 provides a comprehensive overview of the Iberian power futures market, including a basic description of the coexistent regulated forward contracting mechanisms, and comparison with the liquidity levels of the Spanish OTC market and with the most mature European power futures markets; (iii) Section 4 performs a thorough analysis of the traded volume drivers in OMIP continuous market by means of a regression model and correlation analysis; (iv) Section 5 formulates recommendations for the proper development of this market; (v) Section 6 concludes summarizing the main findings and suggesting further research.

2. Literature review of liquidity in energy markets

2.1. Academic research

Fusaro [13] researches about the emerging energy derivatives markets since the 1980s (oil and gas) and 1990s (power) describing their specificities compared to the original pure financial markets. He defines liquidity as a characteristic of a market where there is a high level of trading activity. He provides an overview of the development of North American, European and Asian oil, gas, and power markets. He foresees the liquidity growth in those markets due to the development of energy derivatives. Mork [14] researches about the deregulated European power markets in the 1990s envisaging the emergence of financial markets for electricity. He focuses in three case studies: United Kingdom, Norway and Switzerland. He indicates that the Nordic region has developed a quite advanced and well-functioning electricity trading pool, with widespread financial trading and good liquidity. In order to create healthy financial power markets, the choice of pool model, including spot, adjustment and forward markets, will make or break liquidity. Newbery et al. [9] analyze the inadequate liquidity level of the Dutch electricity market. They indicate that liquid markets enable the immediate execution of standard orders, exhibit prices that are resilient to large orders, and present low transaction costs due to the high amount of active participants and traded volumes. Based on this analysis and on the Monitoring Report on the Dutch Wholesale Electricity Market, 2006, prepared by the Office of Energy Regulation (DTe) for the Netherlands Competition Authority (NMa), Krishna [8] examines the existing measures of liquidity in that market adopted by NMa. He defines liquidity as the ability of an asset to be instantly converted into cash without any significant movement in the price. He detects the liquidity improvement caused by the decline of the level of bid-ask spreads in the period 2006–2007. He also detects a positive, though insignificant relationship between the volatility of electricity prices and the level of liquidity in the Dutch electricity markets in that period. Hence, the volatility in prices in this electricity market during this period is not necessarily a sign of illiquidity. Batlle et al. [15] indicate the positive effects of the *market maker agreements* for enhancing liquidity. Their research, applied to the French balancing power market, proposes to introduce such agreements in order to improve efficiency. Market makers are needed when the structure of the traders is such that liquidity does not arise naturally. A market maker is an exchange member obliged to make a continuous two-way price, creating bid and ask prices for a given security. It generally maintains inventory and stands ready to buy and sell at the quoted price to keep a functioning market and fostering liquidity. Due to such a dynamic and active quotation service, they constitute a key factor in attracting new actors in the organized markets [16]. Otherwise, the new actors should be mainly obliged to contract OTC brokerage services to find counterparty, or establish bilateral contracts. Meeus [17] analyzes the regulation of the European power exchanges, distinguishing between "merchant" and "cost-of-service-regulated". He indicates that the exchanges can benefit from a positive network externality, as liquidity attracts liquidity. The liquidity supporting measures fostered by regulators, forcing international traders, Transport System Operators, or incumbent generation companies to trade on the incumbent power exchange, improve the liquidity of that exchange. However, due to the natural monopoly features of the exchanges, they reinforce the dominant position of the incumbent power exchange, which can be problematic. Molzahn and Singletary [18], in their research about the Financial Transmission Rights (FTRs) in the North American Midwest Independent System Operator (MISO) auction market, indicate that the large speculator profits are potentially concerning. On the other hand, they find support to the argument that speculators confer useful liquidity benefits. Regarding liquidity of emission trading programs and international emission markets, an overview can be found in [19]. For the case of Tradable White Certificates (TWCs), Mundaca [20] describes the liquidity increase due to the implementation of a European scheme to improve energy efficiency.

2.2. Supervision reports in European energy markets

2.2.1. Monitoring of market liquidity by the European Commission

The Directorate-General for Energy (DG ENER) of the European Commission performed in year 2008 – at that time named DG TREN, as it also covered transport issues – two analyses of EU wholesale energy markets. The first one [21] evaluates the factors impacting on current and future market liquidity and efficiency. EU wholesale energy markets were relatively underdeveloped. Wholesale power markets were significantly more advanced than natural gas ones. Progress was not uniform and there were large variations in market liquidity and efficiency across the EU. Natural gas, power and CO_2 trading is a deregulated activity with a large and growing proportion taking place in the opaque OTC market. Exchange prices set a benchmark for spot prices. OTC is seen as more flexible, cheaper, and offering more specialized products. There is a strong inverse relationship between the levels of *market concentration* and the degree of liquidity. Improvement in supply and demand data *transparency* is a quick-win. The second report [22] analyzes the historical data of EU wholesale electricity, natural gas and CO_2 markets. For power exchanges during 2002–2007, a clear increase is found in traded volumes, market participants, and price correlations. There is a negative relation between an increase in market participants and *volatility*. Price volatility remains notably high on spot power trading. Derivative contracts are higher in volume, less volatile but more concentrated on one exchange (the German based European Energy Exchange, EEX). The substantial OTC growth (traded volumes doubling since year 2006) is caused by