A blocked takeover in the Polish power sector: A model-based analysis

Jacek Kamiński *

Mineral and Energy Economy Research Institute of the Polish Academy of Sciences, Energy and Environmental Policy Division, Wybickiego 7, 31-261 Kraków, Poland

HIGHLIGHTS

- A takeover blocked by the President of the Office of Competition and Consumer Protection was analysed.
- A game theory-based model of the Polish wholesale electricity market was applied.
- The impact of the takeover on electricity prices and generation levels, surplus transfers and dead weight loss was estimated.
- The results were compared with the declared synergy savings.

ARTICLE INFO

ABSTRACT

As the President of the Office of Competition and Consumer Protection refused to approve a government initiated takeover in the Polish power sector and the Court of Competition and Consumer Protection did not make a ruling on that case, the takeover was finally prohibited. In this context, the main aim of this paper is to carry out a quantitative analysis of the impact of the takeover in question on electricity prices and quantities, consumer and producer surpluses, dead weight loss and emissions.

The scope of the study covers the Polish power generation sector and the analysis was carried out for 2009. A game theory-based electricity market equilibrium model developed for Poland was applied. The model includes several country-specific conditions, such as a coal-based power generation fuel-mix, a large share of biomass co-combustion, etc. For the sake of clarity, only four scenarios are assumed.

The paper concludes that the declared synergy savings did not compensate for the increase in dead weight loss and the transfer of surplus from consumers to producers caused by increased market power.

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1. Introduction

Over the last 12 years the consolidation and privatisation policies adopted by Polish governments have resulted in a significant increase in the potential for market power in the power sector. Of all the mergers initiated by the Polish government, the most drastic was the last one, carried out in 2007, a year after the approval of the Programme for the power sector (2006) that had been prepared by the Ministry of Industry. The main objective of that programme was to consolidate the power sector in a way that would ease access to the capital needed for the new investments considered essential in order to maintain the long-term reliability of the power system. For this reason those power companies whose shares were owned by the State were consolidated into four energy groups. That led to a significant increase in market power indicators, the Concentration Ratio of the largest supplier increased to almost 40% (in terms of electricity generation), while the HHI (Herfindahl–Hirschman Index) soared to almost 1950 in 2008 (Kamiński, 2012). Although the power sector was already highly concentrated, shortly after the completion of the 2007

mergers, the government announced it would sell approx. 84.2% of the shares of Energa SA (market share 2.5% in terms of power generation and 16% in terms of electricity distribution) to the Polish Energy Group (*Polska Grupa Energetyczna – PGE SA*) (accounting for approx. 40% of total electricity generation and 29% of distribution). Thus, on the 29th of September 2010, the Treasury Minister signed a contract, in which the shares were sold to PGE SA. This decision was, as is typical in such cases, largely explained on the grounds of the necessity of strengthening the biggest Polish power companies in order to ease the process of investment in the first greenfield nuclear power plant construction project in Poland. However, it could also be explained by the budget gap which needed to be covered by the income from the sale of shares, since the value of the proposed transaction was approx. €1.9 billion. Whatever the reasoning, runs against the already damaged concept of electricity market liberalisation which needs competition in order to become a successful reform.[1]

Unsurprisingly, even before the contract was signed, the former President of the Energy Regulatory Office expressed his criticisms,

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* Tel.: +48 12 633 02 96.
  E-mail address: kaminski@meeri.pl

[1] An interesting view on the lessons that could be drawn from the liberalisation era in the context of transition to a low carbon energy system was recently presented by Pollitt (2012).

saying that it would not bring positive outcomes for competition in the power sector. Another matter was that neither had this arbitrary governmental decision been analysed by any ministry in the context of the impact on competition in the electricity market, nor had any results of such analyses at least been made public. Only when the contract had been signed and announced was a simplified study on the impact of the takeover on the competition in the power sector carried out, because this transaction needed the approval of the President of the Office of Competition and Consumer Protection (a central body of state administration). The study was carried out based on two general methodological concepts: (i) a simplified qualitative analysis of the current situation in the Polish power sector and (ii) a survey applying a questionnaire that was sent out to relevant power producers, traders, retailers, distribution system operators, the transmission system operator, consumer representatives, and sectoral associations. Consequently, on January 13th, 2011, the President of the Office of Competition and Consumer Protection refused to approve the takeover in question despite there having been no quantitative welfare analyses carried out to estimate its potential impact on electricity prices and production, consumer and producer surpluses and dead weight loss.[2] The immediate consequence of the refusal of the approval was PGE's appeal to the Court of Competition and Consumer Protection on January 28th, 2011, asking it to make a ruling on approval of the takeover. On May 14th, 2012, the Court dismissed PGE's appeal, hence the takeover was definitively prevented.

Although the literature on the impact of mergers and acquisitions on the performance of the power sector[3] as well as on the application of a model-based approach to market power analysis[4] is quite extensive, not many papers analyse the impact of M and A (Mergers and Acquisitions) on welfare distribution in the Central and Eastern European (CEE) power markets using computable models. The specific features of power sectors in those countries should not be neglected because they are heavily influenced by the historical belief in the leading role of State as the only guarantor of the long term reliability of the power sector. Even though more than 20 years have already passed since the beginning of the economic transformation in those countries, the way the power sector is perceived by society has not yet totally changed. A substantial part of society still believes that only the strong participation of the State in the energy sector is a guarantee of

energy security and affordable prices of energy carriers. This also supports the idea of the creation of so called "national energy champions" which are supposed to ensure that all that it is said that society expects is provided. However, if one goes into further detail one will find out that those companies already take advantage of their market power and State participation in the ownership structure of the sector does not imply that market power is limited. Otherwise, budgetary needs result in the Government searching for each and every additional source of income, including dividend yields and/or sales of State-owned shares in power companies. The takeover of Energa SA by PGE SA is a perfect example of the latter.

Since the reasoning behind the refusal to approve decision of the President of the Office of Competition and Consumer Protection was mostly based on the outcome of questionnaire analysis and since no quantitative welfare analyses had been made beforehand, the main motivation of this paper is to provide estimates of the outcomes of the takeover in question. Furthermore, to the best of our knowledge, no quantitative analysis of this type employing a game theory-based computable model has been carried out for any consolidation or privatisation in Poland.[5] Therefore, this paper contributes in this regard as well, both theoretically and empirically. The impact is assessed in terms of typical measures in such cases, namely: electricity prices and production, consumer and producer surpluses and the dead weight loss. The results are then compared to the declared synergy savings.

Although the literature on the application of the modelling approach to M and A analyses of CEE countries is almost non-existent, there are, however, some examples of such studies carried out for other countries. Bower et al. (2001) used an agent-based model to study strategic consolidation of the German power market. They found out that the consolidation could result in an increase in average peak prices of up to as much as 87%. They concluded that M and A leading to the creation of only four firms would lead to a significant increase in market power and would lead to an increase in prices. Amundsen and Bergman (2002) considered cross-border mergers. Based on a two-country model developed for Norway and Sweden, they concluded that power companies increase market prices, pointing out however that the increase in prices could be partly compensated for when Swedish and Norwegian markets are treated as a common one. Nilsson (2005) carried out a quantitative assessment of the impact of the proposed merger between Swedish companies Sydkraft and Graninge on social welfare. The obstacles that energy regulators and antitrust authorities have to face when dealing with approvals of M and A were identified with special attention being given to the importance of measuring the impact of M and A on future welfare. That study employed a simplified simulation model based on the Cournot approach. It was concluded that the approval of the merger in question would lead to a decrease in social welfare. Lise et al. (2006) studied a potential divestiture of the significantly concentrated markets of France and Belgium, assuming a split into four companies of market share of 30%, 25%, 25% and 20%. For this purpose a game-theory model of the European electricity market was developed, based on a model applied previously to the

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[2] Even other traditional merger tools based on the HHI are usually misleading when the power sector is involved, as pointed out by Farrell and Shapiro (1990) and Stoft (2002).

[3] The theoretical and empirical works on the M and A have been summarised in several papers, hence, they are not repeated herein and only references are provided. Please see the following recent papers for those reviews: Kwoka and Pollitt (2010), Keller (2010), Granier and Podesta (2010) and Verde (2008). Although it is quite often proclaimed that mergers and acquisitions in the power sector improve efficiency, there are some studies that invalidate this theory. For instance, Kwoka and Pollitt (2010) analysed the impact of mergers that took place in the US power sector over the period of 1994–2003. Based on data envelopment analysis, they found out that those mergers did not improve cost performance.

[4] In principle two generic approaches have been exercised in recent years when developing market equilibrium models: (i) the Cournot-based approach with or without the inclusion of Conjectural Variations (Yang et al., 2002; Lise et al., 2003; Hobbs and Rijkers, 2004; Hobbs et al., 2004; Liu et al., 2007; Chen and Hobbs, 2005; Lise and Kruseman, 2008; Linares et al., 2008; Lise et al., 2008; Tanaka, 2009; Schill and Kemfert, 2011; Amundsen and Bergman, 2012 and Kamiński, 2011), and (ii) the Supply Function Equilibrium (SFE) approach (Klemperer and Meyer, 1989; Baldick et al., 2004; Rudkevich, 2005; Morris and Oska, 2008; Green, 2008; Holmberg, 2008; Gao and Sheble, 2010; Ciarreta and Paz Espinosa, 2010; Green and Vasilakos, 2010). Please also see: Ventosa et al. (2005) for a concise review of the main approaches applied to power market modelling, Willems et al. (2009) for a comparison of the SFE and the Cournot based models in the context of the robustness of results, and Neuhoff et al. (2005) for a discussion of electricity market models based on the Cournot approach developed by different research groups.

[5] There have been very few quantitative analyses of mergers and acquisitions in the Polish power sector. Guzik and Panek (2002) carried out one of the first investigations on market power, based on two indices: the Concentration Rate and the HHI. Kawała (2003) discussed the operation of the electricity market in the context of market power. Kaproń (2007) analysed general conditions to ensure competition in the Polish power market. Pałka (2011) analysed the role of regulation in the power market with the employment of a simulation tool that is based on a detailed model of a two stage balancing market. One of the scenarios considered was a merger of two power companies. Kamiński (2012) discussed mergers and acquisitions in Poland with the employment of an index-based approach.