

COST OF COMPLEXITY AND THE REFORM IN THE POWER SECTOR

(AVOIDING CHAOS IN THE PATH TO AN OPTIMAL MARKET STRUCTURE)

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Rezumat. *Reforma unui sector energetic cu un singur jucător (adică un monopol natural) într-o piață a puterii a mai multor jucători aduce clienților nu numai beneficiile concurenței, ci și costurile complexității. Între cele două, un număr optim de jucători se găsește pe piață corespunzător prețului minim de putere pentru clienți. Considerând timpul ca fiind a treia dimensiune, curba optimă devine o suprafață potențială pe care evoluția entităților de piață este văzută ca oscilații de-a lungul văii prețului minim. Fiecare oscilație declanșează o explozie de preț care este în detrimentul clienților. Pentru a evita acest lucru, rolul autorității de reglementare este mai bine definit în sensul de a netezi tranziția de la monopol la piață. Exemplul evoluției sectorului energetic din SUA este relevant aici. În abordarea de mai sus, concurența pe distanțe lungi care rezultă din viitoarea deschidere a piețelor energiei electrice în Europa sau din penetrarea, în urmă cu 70 de ani, a tehnologiei de interconectare în SUA, este comparată cu concurența cu rază scurtă (locală). În cele din urmă, se stabilesc limitele de preț care garantează că (i) noii intrați pe piață nu sunt eliminați și, (ii) că piața evită oscilațiile care pot șoca drastic o economie nerezistentă. Se face un studiu de caz pentru România și se propune o metodă prin care costul complexității este evaluat pe baza raportului dintre energia tranzacționată și cea consumată, adică mai multă energie tranzacționată, înseamnă că prețul crește cu fiecare tranzacție care nu aduce energia consumatorului, ci altor comercianți. Un exemplu este prezentat pentru actuala piață deschisă din România.*

Abstract. *The reform of a one player power sector (i.e. a natural monopoly) into a multiple players' power market brings to the clients not only the benefits of competition but also the costs of complexity. In between the two, an optimal number of players is found in the market corresponding to the minimum price of power to the clients. Considering time as the third dimension, the optimum curve becomes a potential surface on which the evolution of the market entities is seen as oscillations along the valley of minimum price. Every oscillation triggers a price burst which is detrimental to the clients. To avoid this, the role of the regulator is better defined in the sense of smoothing the transition from monopoly to market. The example of the US power sector evolution is relevant here. In the above approach long range competition resulting from the future opening of power markets in Europe, or from the penetration, 70 years ago, of the interconnection technology in USA, is compared with the short range (local) competition. Finally, the price limits are determined which ensure that (i) the new entrants on the*

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market are not eliminated and, (ii) that the market avoids oscillations which may drastically shock a non-resilient economy. A case study calculation is done for Romania and a method is proposed where the cost of complexity is assessed based on the ratio of traded energy to consumed one i.e. more traded energy means that the price increases with every transaction that is not bringing the energy to the consumer but to other traders. An example is presented for the present open market of Romania.

Keywords: *Power market, reform, optimality, chaos)*

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1. Introduction

A lot is happening these days in the power industries both in Europe (East and West) and in the United States, Australia, etc. The main trend is toward the change of the monopoly dominated national power sectors into power markets. The benefits of the competition, implemented through this change, are measured by the decrease, in the long run, of the price of energy to the clients. Alas, there is no such thing as a free lunch! That's why we try to assess here the price to pay, for the benefits of competition, that result from the costs of the increased complexity of the market. Can this cost be minimized? Is there an optimal structure of the market which results from the interplay between the benefits of competition and the costs of complexity? Below, we are trying to answer these questions, first by defining the behavior of the process and, second, by building conceptual tools that may allow the determination of the best strategies to face the new power market. The role of the regulator is presented in the light of these strategies.

General comments on (market - monopoly - market) cycles

From the point of view of the information, the cycle of passing from a market economy to a monopoly dominated one (the outmost extreme is a centrally planned one) and back to a market economy is showing a hysteresis effect. The pass from market to planned is done by nationalization which triggers a process of information flow from the enterprises level in the market, to the centrally planning entity. In time, no enterprise will know any longer who are the manufacturers of raw materials and who are the clients for its products, but, they will only know that raw materials are taken from a certain store house and that products are to be delivered to another specified store house. It is only the central planner who will have full, real knowledge about the market.

To reverse this process, i.e. go from planned to market, one can not, simply, reverse the nationalization action into a liberalization one. If the liberalization is done before having re-introduced all the market information back to the level of
