ASPECTS REGARDING THE PROFITABILITY OF THE NEGOTIABLE POLLUTION PERMITS (II)

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Rezumat

După anul 2000, problematica referitoare la comercializarea cotelor de emisii a prezentat interes pentru studiu şi cercetare, de puțin timp, ca o consecință a observării efectelor negative pe care poluarea mediului le manifestă asupra omului, economiei, societății, naturii.

În ultima perioadă, o parte însemnată a specialiştilor din domeniul protecției mediului a încercat să găsească răspuns la întrebarea: „de ce comercializarea cotelor de emisii a devenit o componentă cheie în reforma politicii de mediu?”. Pentru a răspunde la aceasta întrebare, dar şi pentru a oferi o bază consistentă de evaluare cu succes a reformelor ambientale, trebuie definite unele noțiuni cu privire la alocările optime a controlului responsabilității. Teoria pe care se bazează rentabilitatea costurilor - principala bază pentru reglementările actuale - este dezvoltată şi utilizată ca una dintre principalele căi de măsurare şi apreciere a sistemelor existente.

Abstract

After 2000, the problems regarding the trading of the emissions quotas was only recently of interest for study and research because of the adverse effects which environmental pollution has on the humans, economy, society and nature.

Recently, the bulk of environmental protection specialists tried to find an answer to the question: “why did the emissions quota trading became a key component in the reform of the environmental policy”? In order to answer this question, and to provide a consistent basis for

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the successful evaluation of the environmental reforms, we need to define some notions regarding the optimal allocations of the responsibility checking. The underlying theory of cost profitability – the main basis for the current regulations – is developed and used as one of the main ways to measure and evaluate the existing systems.

Keywords: emissions quotas, profitability, internalization of the externalities

JEL Classification: Q52, Q56

Setting the prices for the polluting permits: conceptual models

Within the system of tradable permits there are two types of concerns regarding the market power. The first one appears when the participants, buyers or sellers, exercise their power on the market in order to manipulate the price. The second concern appears when the market power of the tradable permits is used strategically in order to get an advantage on the product market.

The manipulation price. Hahn (1984) has shown that the importance of the market power can be affected by the initial allocation of greenhouse gas emissions certificates[1]. His most important results show that the market potential is a function of allocation. Intuitively, this result is obtained because the capacity of

[1] *Based on a better knowledge of the environmental problems, the public authority sets maximal allowed pollution norms for each area of activity. The total amount of tolerable pollution is materialised in a determined number of pollution permits. They are issued by the state and sold on a specific market. The economic enterprises polluting in the field targeted by the government are interested to buy them. The number of permits in possession will determine the maxim admitted level for the polluter which holds the permits and period for which the pollution right is valid. Polluting beyond the quota allowed by the bought permits involves expenses for depollution. A climate of competition builds up between the economic enterprises interested in the pollution permits. Each one will be interested to buy pollution permits until the marginal cost of such permit becomes equal to the cost of depollution. The state holds control by setting the general admitted quantity of the polluting emissions. Furthermore, it can harden the conditions imposed on the economic enterprises by varying the price of the pollution permits.*

exerting the market power depends on the degree to which the sources can affect the price of the credits actually traded.

We will suppose that one or more companies (which we will call price-setting companies) try to gain control on the price of the permits in order to ease their financial burden. The extent to which they succeed to di this depends on several factors, one of which being the initial method of allocation.

When a restriction is used on a traditional market when distributing the pollution permits to all the emission sources, and the single control authority would be the seller, the capacity that any source or several sources influence the price paid for these permits depends on the size of the demand related to the demands for other sources. On a market with a single source, this source might get the polluting permit with extremely low costs, because any positive offer would be decisive, and the expenses would be close to zero for this source, even if a tender is organised.

Such situation becomes complex for several sources. Supposing that a company wants to have control on the prices, while all the other players on the market just settled to act as price factors, the company settling the prices, by claiming an unjustified low demand for permits, might reduce the price.

To simplify the matter we will pick the example of two sources of bidding for these permits. Suppose the first source uses the buying behaviour in order the control the price, while the second is the beneficiary of this price. Each additional pollution permit purchased by the first source would lead to a higher price, not just for the additional permits, but also for all the permits. Therefore, in order to maintain a low price of the pollution permits, the source which is setting the prices must buy fewer permits than normally allowed, which means a higher cost of control.

Therefore, these conclusions yield a flow of key-intuitions about this simple conceptual pattern:

- The prices of the polluting permits are lower in a non-competitive tender than in a competitive tender;
- The price set by the company after the checking of emissions is much higher than if it would have acted as price of the beneficiary on a purely competitive market;

- Because the total emissions would be the same on the competitive and non-competitive markets because of the set ceiling (MAC – maximal allowed concentration, highest concentration of a noxious substance in the environment allowed by the acting rules), it would have to control less emissions on the non-competitive market than on the competitive market;
- The control of the responsibilities for the market allocation of the non-competitive transactions is not profitable;
- The total control costs in order to reach the target level of reducing the emissions are higher on the non-competitive markets than on the competitive markets.

From what we showed above, we may say that the source which sets the price causes significant prejudices to other, less aggressive sources. Such results can be surprising.

The use of the permits on markets with strategic purposes will only be possible if:

- (1) A significant part of the output of an industry is produced by companies located in the same geographical area;
- (2) The market for the tradable permits in this region is sensitive to the manipulation price.

Efficiency and price manipulation. In 2000, Godby examined the effects of the market power, both on the permit market and on the product market. In an experiment with a single seller, which would manipulate the market, and ten peripheral companies, which would behave as buyers, Godby concluded that the experimental results are much closer to the prediction of Hahn's theoretical model, than of the prediction given by the competitive pattern. Thus, his experiments show that the inefficiency caused by the power of markets might exceed even the inefficiency caused by the command-and-control.

Market control through market design

The repeatedly asked question regarding the setting of the pollution permits is: when is the possibility of the market power foreseen?

Hahn (1983) conducted several experiments which involved three disparate simulations. The initial allocation of the permits was different for each of these simulations. Each allocation was repeated ten times in order to ease the learning process. Hahn (1983)

discovered that even when the initial allocation deviated considerably from the least cost allocation, the tender with zero cashing. Subsequent experiments by Hahn supported these results. This confirms the fact that the tenders, even those with 0 cashing, are less susceptible to market power than the allocations with no distribution.

Does the type of bidding matter? Muller (2002) focused on the format of another type of bidding, the double bidding. As noticed, this pattern was thought to be less susceptible to the power of market than other types of bidding, and the experiments were designed to test this hypothesis. These experiments introduced the market power on the side of the seller or buyer, by the aggregation of five sellers and of five buyers, respectively. The main conclusion of the experiments is that the double biding is not as tough as the market power, as initially thought.

Cason (2003) examined whether a dominant company might exert the market power on the permit market using the double biding trading institution. The parameters of the experiment were set as to approximate the costs of the pollution sources in a proposed market of negotiable permits. The initial allocation of the permits was monopolist in another experiment too, while in other experiment the market was dualist. It was noticed that the price and profit of the sellers were higher and that the efficiency was lower in the monopolist experiments, compared to the duopolistic experiments, but the difference was not substantial, or statistically significant. Furthermore, it was noticed that the prices, profit and traded volumes were much closer to the competitive balance than to the monopoly balance.

Carlen (2003) conducted an experiment in order to stimulate the international trade of carbon. In his experiment he included a large buyer which represented the United States. A differential characteristic of this experiment was that the participants in the experiment didn't have any opportunity to gain market experience by repeating the experiment, a characteristic about which Carlen said that it is close to what really happens in the international trade of permits due to its novelty. In this experiment, he didn't find any way to explain the distortions by the potential market power.

Bohm and Carlen (1999) examined the importance of the power market within a similar political context: the component of joint

implementation the Kyoto protocol. Within the joint implementation, the investors negotiate the financing of environmental projects in another country. As the project with joint implementation requires specific negotiations between several partners, there is the possibility for the manifestation of the market power.

The study revealed some evidences of the market power, which were too small, however, to be taken into consideration. It was noticed that the negotiations resulted into trading operations which, overall, were efficient, however. Thus the market power didn't prevent the execution of these operations.

It seems that several studies provide different evidences. While a study (Godby, 2000) considers that the market power is a sufficiently important problem as to compensate for all the other advantages of the traded permits, most studies considered exactly the opposite.

Mechanisms to control the market power. For any bidding, traditional or not, but which looks vulnerable to price manipulation, special biddings can be made, which counteract this power. Known as intention-compatible biddings, they use unilaterally their own offers with the purpose to control the price.

The procedures of an intention-compatible bidding are rather simple. Same as with an ordinary bidding, each source inputs the curve of the demand for permits, listing the number of permits wanted for each possible price. The judge collects all these offers, sets the price at the intersection of the demand curve with the offer curve and gives the permits to those offering at least the balance price.

Until now, the procedures are identical with those from the conventional system of bidding. The difference appears when determining the price to be paid for the wanted permits. Unlike the bidding with a single price, where all those bidding should pay the balance price for the earned permits, the prices paid for *n* permits purchased by any source through an intention-compatible biding, should be equal with the highest *n* offers of other sources. Because these rejected offers are by definition lower than the market price (otherwise they would have not been rejected), the intention-compatible biddings involve lower expenses with the permits than the traditional biddings with a single price.

This method which determines the amount and the price removes the intention of the source to reduce the price of bidding,

understanding the demand. Even if the understanding of the demand of any source might lead to fewer permits, it could not reduce the price paid for permits in absence of the interaction with other sources. Because the price is determined by the rejection of the offers from other sources, no source can, unilaterally, influence the price it pays for permits by the artificial increase or decrease of its demand. It could only increase the controlling cost by the attempt to influence the process.

Fortunately, fewer and fewer permit markets incorporate a high number of competitors on the production market. The atmosphere not only includes a number of different sources, but on most permits markets, the industrial sources polluting a specific area, rarely has a higher coverage on the product markets.

The absence of coverage suggests that on most product markets, the permit market would be a quite (sometimes fully) inefficient means to be used against the competitors by a predating source. Most competitors on the permit market would no longer have competitors on the product market. The banning of permits for the few rivals would increase their financial burden, but would not offer the predating source too much gain.

There have been questions regarding the ability of the existing companies to use the emission trading as a barrier to other companies. Even if no evidence for this behaviour has been materialized, the desire to reassure the worried ones lead to the establishment of a set-aside, a pool of permits available for the new-comers.

In the EU, the European Commission demands the member states to describe the way in which the newcomers obtain access to the emissions bonuses. There are no rules deciding whether the newcomers should receive extra bonuses. However, all member states guarantee that a specific volume of bonuses will be available freely to the newcomers, by the establishment of a set-aside of bonuses especially for the newcomers. The bonuses from this set-aside are given according to the principle “first to come, first to be served”. (Ahman et al, 2005)

In some programs for environmental protection, the set-aside bonuses are available at a predetermined price. This pool of bonuses has never been accessed afterwards, but this doesn’t mean it was not

useful. It might have increased the political feasibility of the program by providing reinsurances to the newcomers and by limiting the potential gains of the predating behaviour.

Ultimately, if there will be worries about the market power on the permit markets, it is possible to limit the concentration of the permits at a single source. Even if the worries about the market power on the air permits markets never reached the level at which the limitation of concentration are imposed, some markets adopted them successfully by introducing more difficult conditions for permits (for instance in fisheries).

As noticed from the experiment of Hahn and from the successive patterns, the allocation of control responsibility may affect the market power. The fact that most permits are distributed freely means that some specific rules of distribution might raise more problems than in the case of bidding. On the other hand, it is not obvious that the common distribution rules create the type of situation which leads either to price manipulation, or to the reduction of market competition.

While the traditional or subsidised biddings place all sources on the same side of the market, in the approach of the continuous utilisation of the property, some sources are the buyers, while other sources are the sellers. This approach divides the participants in buyers and sellers. Depending on the initial rule of distribution, some sources would incorporate a significant proportion of buyers and sellers, a rule which leads both to price manipulation and to a lower competition.

As shown above, the rule of distribution which creates most problems allows the disproportionate use of the distribution of permits to very many large sources. Because of the scale economies, these sources might sell permits without increasing the cost of control. The purchasing sources, under the conditions of a high deficit of permits and of high marginal costs of control, are vulnerable to price manipulation and to any other predating source which tries to exclude it out of the business.

Generally, the used distribution rules are often beneficial in protecting the sources from predators. Because the initial allocation is generally economically feasible, the existing sources should not be forced out of the business even if no other source would sell them

permits. On the hand, the failure to purchase permits on a bidding market would mean, in most cases, closing down the factory.

In the case of the existing permit markets, a specific initial allocation increases the worrying of the market power – the allocations set by the Kyoto Protocol. In this case, the distribution of the initial allocation was based on the 1990 emissions. The selection of a reference plan combined with a serious decline of the economic productivity after 1990, might have made the less economically developed countries important sellers of emission rights to other countries. More than that, following this surplus of emission permits, and the lack of a coercive influence from the marginal costs of control (because the surplus didn't require any subsequent reductions), the possible effects of the monopolistic behaviour of Russia and Ukraine regarding the permits would reduce the efficiency of the permit markets. Preliminary estimations of the Organisation for Economic Cooperation and Development GREEN suggest that the influence of market power would reduce by almost one third market efficiency.

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