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Conflict and cooperation with respect to European natural-gas regulations

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Abstract

Significant economies of scale and scope in the European gas industry make many transmission and local distribution companies natural monopolies in the markets in which they operate. Often, this gives them a strong market power and they experience little competitive pressure. Hence public interventions into the functioning of the market, as seen under the initiatives taken by the European Commission, such as the ''Gas Directive'' occur. This paper discusses a game between the public authority and the transporters, where various levels of conflict and cooperation will influence how far regulations will go and how they will be designed.

Keywords: European gas; EU; Natural monopolies; Regulation; Transmission

1. Introduction

Most markets for natural-gas transportation are highly concentrated, with few actors involved. Often, the benefits of large-scale operations and scope, as well as the economics in natural-gas transportation effectively inhibit entry for newcomers into the European market. Transportation companies are essential public services, but they also have a great potential for high profits. Generally, operations in the industry face strong regulations from governments.

The argument behind various forms for public intervention in the operation of private natural monopoly transport utilities is that if they are allowed to behave as profit maximizers, without constraints, the consumers and overall economic

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efficiency will suffer. Inefficient operation and possible opportunistic behaviour among monopolistic firms, together with externalities in the use of gas as an important source of energy, the environment, concerns over economic activity, rent distribution, reduced dependency on Middle East oil and lack of information throughout the gas chain, have justified government intervention. It is, however, difficult to establish a fully competitive market in this sector. Rather a visible, regulatory hand is the only option for policy makers to reach social goals. By intervening into firms' functioning, governments wish to overcome market failures created by imperfect market structures and dominating enterprises.

The idea of regulating transporters' terms of operations is that if the market itself does not produce optimal outcomes (when competition is introduced), then it can be mimicked to do so through regulatory and other public instruments. The social first-best solution would often be a subsidized (publicly-owned) enterprise that set tariffs according to marginal costs. This has been the tradition in many European countries in the aftermath of WW2. However, due to the lack of innovative pressures on and inefficiencies in these companies, nationalized companies are today viewed as inferior to a system that regulates independent (i.e. privately-owned) firms. Even if nationalization and subsidization is the first-best solution in theory, second- or third-best outcomes may be its ultimate result. When the European gas-market becomes liberalized, part of the process in many countries is possibly to (partially) privatize the transport utilities, and then start to regulate their terms of operation.

There are many techniques for intervention into the behaviours of natural monopolies like the gas transport utilities. Most well known are rate-of-return regulations, various forms of price discrimination, as well as the use of subsidies and multipart tariffs [1–5]. Most of these techniques provide only second-best results from a social point of view, as opposed to the (in theory) first-best nationalization/subsidization scheme. Furthermore, as long as regulators shall 'repair' misallocation of resources caused by imperfect markets, the system of regulated (private) enterprises may easily end up with situations that are either overdetermined or have too many degrees of freedom to yield the desired results. The regulatory history of the US gas-market is an example of this. Thus, in a market for a strategic and non-renewable commodity, as for the European natural gas, regulatory authorities will easily remain an arena of politically-oriented interest groups, within and across borders.[1]

Many EU member countries have already established regulatory procedures and authorities for their gas industries. In a few years time, we may even face a regulatory body at the European level.[2] This paper discusses some of the issues that arise in the relationship between the authorities and the gas-transport companies in the process towards achieving regulated terms of their operation. Will gas transporters be better off by going into conflict with the regulator and try to halt or stop

[1] Proponents of the so-called *Austrian school* argue on this basis that governments should not intervene in the functioning of imperfect markets, as such interventions would only create new inefficiencies, large bureaucracies and erode people's liberties.

[2] In the efforts to create a liberalized European gas market, and improvements of the so-called "Gas directive" [6], the EU Commission states that "All the respondents on this issue pleaded for strongly independent regulatory authorities, with some arguing for a European regulatory body" [7].

processes that aim at regulating terms for transportation? Or is it better to cooperate and try to "trap" the relevant authority in order to make him/her satisfy the regulations in a way that they want? Is it better for society to find partnership schemes with the industry in order to achieve how operations should be performed, or should governments impose maximum controls?

2. Conflict with the regulator

Generally, transmission companies and local distribution companied (LDCs) will receive lower margins when regulated as compares to with unregulated companies. The drop in profit will be distributed to producers, customers, and final consumers or to producing or consuming countries' treasuries through taxation depending on how the system is liberalized [8]. Even though transmission companies' and LDCs' margins are rather stable, both under the "old" system and in a liberalized market, their economic profit will be lost or, at least, reduced. From the outset, gas-transport utilities have every reason to oppose almost any type of liberalization.

Let us first consider the interest of the regulator (for example represented by the EU Commission) in a liberalization process simplified to a desire to unconditionally take away the transporters' economic profit and give it to consumers. The interest of the transporter is assumed unconditionally to maintain as much profit as possible. Thus, the interests of the regulator and the transporters are conflicting. The general distributional and net effects when markets are liberalized are that the surplus for consumers is greater than the loss incurred by transporters. Therefore the game is not a zero-sum for society.

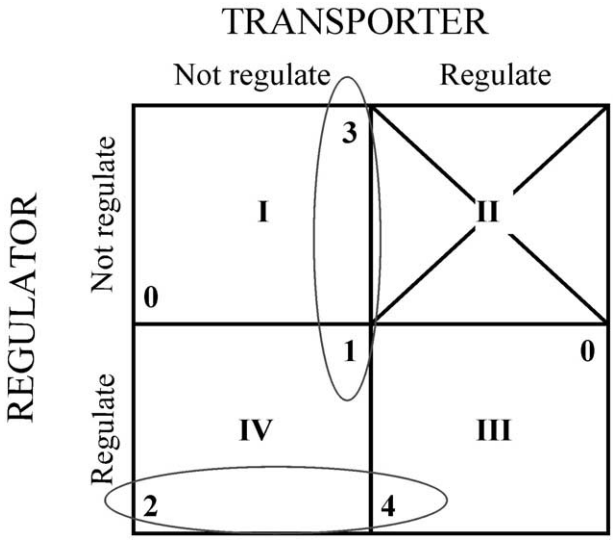

Fig. 1. Regulation through force.

This binary situation (the choice between regulation and no regulation) is illustrated in Fig. 1. Both the regulator and the (potentially) regulated can chose between favouring a process that introduces regulation and a process where no regulation takes place. The outcome for the transporter is depicted in the upper right corner in each cell, and the outcome for the regulator is depicted in the lower left. The best possible outcome for the regulator (consumers) is 4 and for the transporter is 3. The different values correspond to the assumption that regulation (liberalization) provides a net gain for society. The worst possible outcome for both has zero value. All utility is considered ordinal, which means that each party may rank the outcomes, but we do not know how much better or worse one is compared with another outcome.[3]

If the regulator does not regulate, consumers get no extra surplus, which represents their and the regulator's worst possible outcome, and equal to the zero value. At the same time, no regulatory initiative is the best possible outcome for the transporter, i.e. by achieving maximum profit, with the value of 3, as depicted in cell I. At the other extreme, if the market should be perfectly liberalized, and the transporter fully accepts the regulator's terms for operation on a normal profit basis, the consumers' surplus is maximized. This outcome would be the worst possible for transporters, i.e value zero, but the best possible for the regulator, value 4. The outcome when both parties favour regulation is depicted in cell III.

If the transporter opposes regulation and the regulator nevertheless chose to regulate, the outcome for the regulator (and consumers) must be assumed to be less than if the transporters just accept new terms for the operation. Now, transporters fight against intervention, making as much difficulty as possible for the regulator, and try to postpone and destroy the regulator's initiatives. In spite of this resistance, the regulatory efforts can be expected to yield a better outcome for consumers than no regulation at all, but less than if the transporter adheres. This outcome for the regulator is depicted with the value 2 in cell IV. At the same time, transporters will gain compared with a strategy of just following the regulator's desires, but less than if no regulation was introduced, as depicted by the value unity. Cell II represents a situation where the transporters want to be regulated and the regulator does not and is, under our assumptions, considered to be an impossible combination of strategies. The greatest social surplus is given by cell III.

Even if the outcome for each depends on the choice of the other, both the transporter and the regulator have dominant strategies independent of the other's choice. The transporter will gain nothing if regulation is supported, and 3 or unity if regulation is opposed. Thus, opposing regulation will be a dominant strategy for the transporter. The regulator will gain nothing if it does not regulate and 2 or 4 if it does. Thus, favouring regulation will be a dominant strategy for the regulator. Outcome from cell I (0,3), or the status quo, will result if the regulator does *not* have the ability to impose the regulation on transporters without their acceptance. The outcome from cell III (4,0) will result if it can do so freely. The relative political

[3] Under cardinal utility, the utility can be measured and it is possible to say how much better or worse one outcome is compared with another.

strength between the regulator and the transporter will be the main variable in determining what is possible, and, thus, the final outcome. Because of the uncertainty of this strength, this will be the situation of direct confrontation between the parties, and we will end up with the results from cell IV (2,1).

3. Cooperation with the regulator

Let us now assume that the transporter knows that it cannot prevent regulation being introduced. Now, the option "not to regulate" does not exist anymore. Then, the question arises for the transporter whether it is best served by continuing making difficulties for the regulator or if it is better to make an interplay with the authorities in order to design a regulatory regime that is favourable. This is known as a principal/agent problem, in which the agent tries to take control of his/hers principal and trap him/her to act according to its desires ([9], pp. 526–30).

In this situation, when the transporter continues to resist and the regulator nevertheless intervenes, the outcome is assumed to be the same as in the previous game, as depicted in cell IV (2,1) in Fig. 2. The transporter knows that the best result he can expect by opposing a new system is of value unity (cell IV), because the regulator will now certainly introduce regulation (cell I will not be possible). However, by participating in the regulatory process, instead of only opposing it, the transporter might succeed in achieving a value at least as high as when opposing regulation, even though it will still be lower than if no regulation is introduced—set to value 2 in cell III. By doing this, the outcome for the regulator (i.e. consumers) may simultaneously be reduced to less than if the transporter only adheres to regulator initiatives set to value unity. At the same time, when transporters

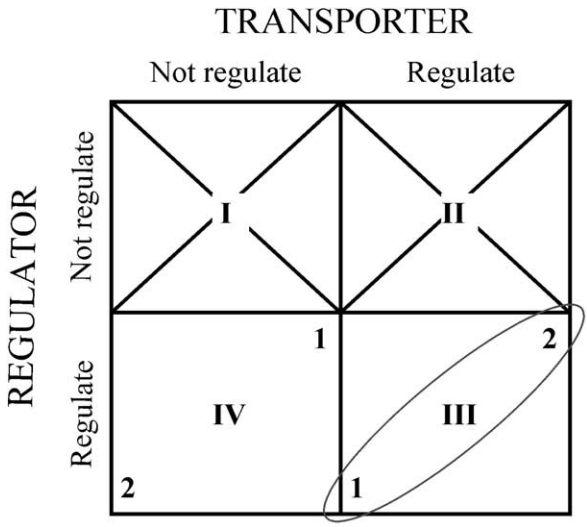

Fig. 2. Regulation through interplay.

participate in the regulatory process, better solutions can be found than if the regulator shall determine all the details. Thus, the outcome for consumers may not necessarily be reduced compared to cell IV, and we could end up with a value closer to for example 2.

In this situation, regulation would yield an improved outcome for consumers no matter what the transporter does (1 or 2). The transporter, however, will change strategy towards collaboration, because it knows that regulation cannot be avoided. By participating in the formulation of regulatory mechanisms, the situation can be improved for the utilities (value 2 in cell III) compared to opposing it (value 1 in cell IV). Interestingly, when the regulator eventually achieves a level of competence that makes it able to intervene efficiently into the terms of operation, the regulator could be better served with a transporter that does not interplay with its action and potentially captures its decisions.

4. Pay-off-matrixes for transporter and the regulator

Transporters may have diverging views on the possibility of introducing a strong (enough) regulatory authority in Europe. The greater the number of transporters that think the regulator will get such an authority, the more of these transporters will start to influence regulatory design and, accordingly, increasingly set the premises for each transporter resisting. Thus, in the beginning, transporters would form coalitions in order to prevent "too many" utilities accepting the introduction of a regulatory process. In this multi-firm dilemma, there may be a critical mass of firms (weighted according to their quantity transported, sunk capital, strategic significance, political influence, etc.) that are needed to prevent the establishment of a regulator and/or to limit its competence as much as possible.

If we, for simplicity reasons, consider transporters as acting as one firm with respect to the regulatory authority, the theoretical results from this regulatory process can be illustrated in a "Schelling-diagram" [10], as shown in Fig. 3. On the vertical axis to the left, the utility for the transporter, U(T), is measured (by its profit) while on the vertical axis to the right, the utility for the regulator, U(R), is measured (by the consumers' surplus). The horizontal axis between the two vertical axes measures the "degree of liberalization". To the left, at point A, no liberalization is introduced; to the right at point B, the market is completely and perfectly liberalized. This is an unmeasurable continuum, but can for example be thought of as the number of regulatory initiatives; the more liberalized, the more interventions the government must take such as increased competition and the introduction of increasingly more regulatory details (and a regulatory authority).

Maximum utility for the transporter is achieved if no regulation is introduced, as illustrated in point C. In this situation, a minimum utility for the consumer is attained, as illustrated in point A. If regulation is established, and the transporter just follows passively the regulator's initiatives, maximum utility for consumers is achieved, as illustrated in point D. In this situation, minimum utility for the transporter is achieved, as illustrated in point B. Thus, the utility-possibility curve goes

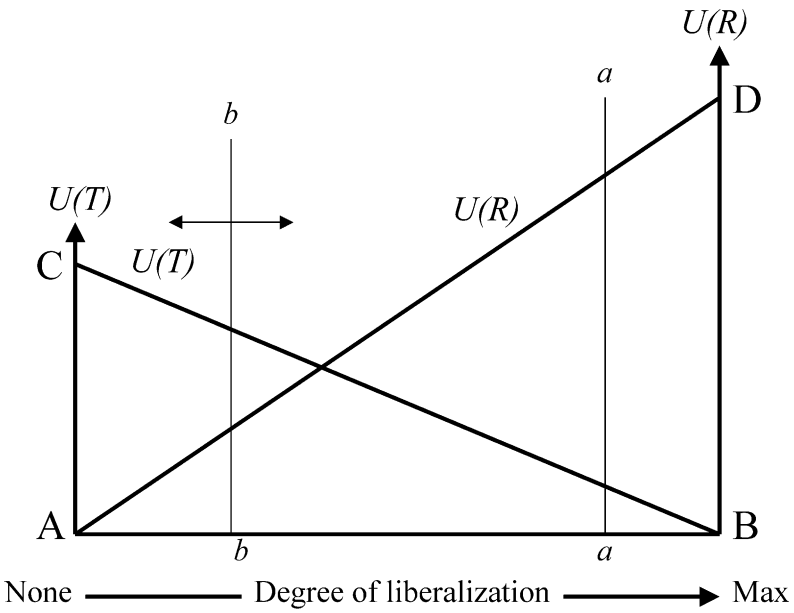

Fig. 3. Pay-off matrix for a regulatory process.

from C to B for the transporters and from A to D for the regulator, as the market is liberalized. The curves' downward and upward directions illustrate that more (and efficient) regulation takes increasingly more profit from the transporters, which increases the consumer surplus. Maximum regulatory utility (point D) is drawn as greater than the maximum utility for the transporters (point C). Point D is higher on the right axis than point C is on the left axis, because the gain for consumers should be greater than the loss for producers under regulation, and in this way, it will be a positive net social surplus.

The outcomes from Fig. 3 can be traced back to the games illustrated in Figs. 1 and 2. In Fig. 1, point C (value 3 for the transporter) and point A (value zero for the regulator) represents cell I, where no regulation takes place. Cell III is represented by point D (value 4 for the regulator) and point B (value zero for the transporter). Cell IV yields outcomes somewhere between C and B for the transporters (value 1) and A and D for consumers (value 2). By opposing regulation, the transporter may succeed in either preventing it from being established, or to maintain some of its profit (i.e. limit the control of the regulator). This will simultaneously reduce the effect for consumers and is illustrated by the vertical line *aa*. Thus, under our assumptions, the line *aa* represents the worst outcome for the transporters (value 1) when conflict with the regulator is chosen, and the best possible outcome for consumers (value 2). If the transporter adheres to regulations, it will end up in point D.

If the transporter knows that regulation will be established, it may start to interact with the regulator to design the system in a best possible manner for itself, as described in Fig. 2. By doing so, the transporter's utility will at least be of value

unity. If it really succeeds in capturing the regulator, the real profit may be increased almost back to a monopoly level (point C). The vertical line bb illustrates a situation where the transporter has managed to regain most of its profit, but not all, through this interplay. The transporter's outcome is somewhere between unity and 3, while the regulator's outcome simultaneously is reduced from value 2 to unity.

5. Efficiency improvements through partnership schemes

The above discussion concentrated on power and counter-power forces between public authorities and the transport companies. If however the transporters could influence regulation in a way that also improves efficiency, and not only for their own profit, as compared to a situation with no interplay with the regulator, there may be Pareto improvements in the process. This may happen because the regulator's insight into the industry's complexity may be limited and partly be dependent on the transporter's information [11,12]. Such examples can be found in the US regulatory history, where the regulator has made inadequate decisions for the industry with huge losses in efficiency and resulting stop-and-go-policies [5]. In this case, the pay-off matrixes may not necessarily contain straight (linear) utility possibility curves for either party. In Fig. 4, $U(T)$ is dropping when some regulation is introduced. After a while, the transporter starts to interact with the regulator in the

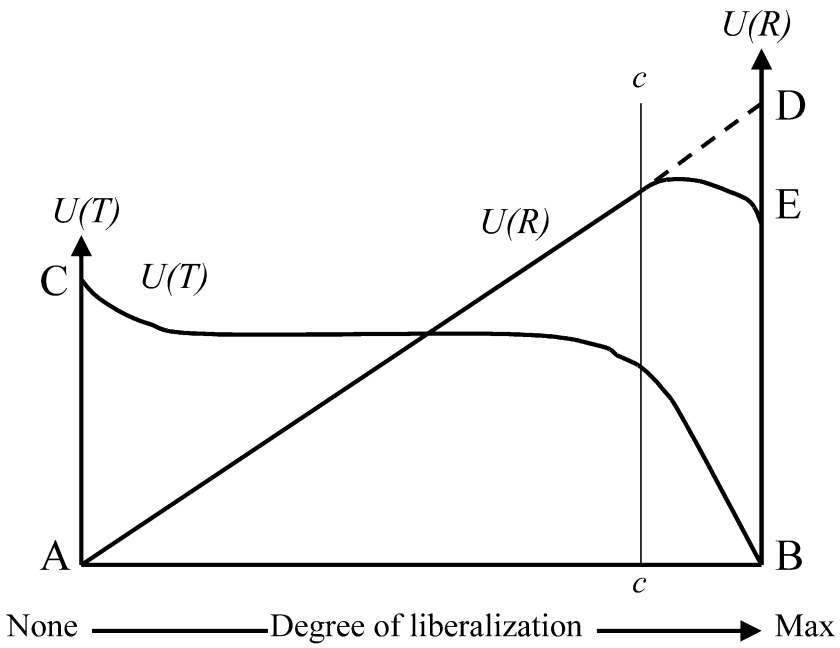

Fig. 4. Pay-off matrix if the pipeline can improve the regulatory efficiency.

formulation of new interventions, and manages to maintain its profit without reducing the benefit for the regulator/consumers.

This is due to the fact that it can suggest arrangements that are more efficient than the regulator could do itself. Overall surplus in the market is increased compared with the more static first strategy. In fact, in this situation, an increasing number of steps towards a more liberal market is taken to the net benefit of the society and only moderate loss to the transporter. At some level of liberalization, however, illustrated by the line *cc*, the transporters may start to loose more substantially. At this point, regulatory interventions are so comprehensive that the transporter's utility curve drops more steeply and ultimately leads to a point B when the market is completely liberalized. In this situation, it is possible that the best point for the regulator could never be reached, because he lacks the ability to liberalize the market perfectly in an efficient manner and, thus, actually needs the collaboration from the transporter. By trying to move the transporter all the way to point B, the outcome for consumers may be worse than if stopped at *cc*. Thus, the net social surplus may drop if more regulation beyond this point is attempted to be forced through.

6. Conflict or cooperation?

Of course, the two ways the utility curves are drawn are just examples of their many possible natures. They may be bowed in various ways or even be discrete. However, independent of the shape of the utility curves, we observe that the transporters' strategy depend heavily on whether a regulatory authority gets the power and ability to liberalize the market or not. The transporters would probably adopt a dual strategy opposing any initiatives taken by authorities on market intervention and simultaneously prepare for interplay in designing the optimal regulatory regimes, if or when they come.

Transporters will be best served if they succeed in delaying or destroying political decisions giving such power to regulatory authorities, pointing out the complexity of regulations, security issues, risk or any other arguments that work. If possible, they will form coalitions, possibly even fusion with each other. But when or if a decision about actual regulation is made, nevertheless, transporters should shift to a partly collaborative strategy. The regulator should, on its side, try to devise a possible collaboration between transporters by starting to design regulatory regimes with only one or a few of them. If a critical mass of transporters interact, the rest must follow, as well.

In the dynamics of this decision-making process, the strategies may shift from conflict to elements of cooperation, and back. When and how the parties should or would collaborate and when they confront each other, depend on the shape of the curves. The shape depends on market complexity, competence of each party, ability to intervene, etc. If one accepts that it is difficult to reach a fully and perfectly liberalized market, one should rather discuss what would be the optimal degree and form for regulation, not only in the sense of economic efficiency, but also in terms of political feasibility (*cc*).

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