

THE REGULATION OF NETWORK INDUSTRIES

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Abstract

The paper is concentrated on the regulation of network industries with the presence of natural monopoly. Regulation of network industries must meet two basic conditions. on one hand, to reduce the social costs of monopoly and protect consumers, on the other hand, to create a sufficiently transparent and predictable business environment. Only in such environment, businesses are able to formulate and long-term and strategic decisions. The current state of regulation in network industries in the Czech Republic is described in the further section of the contribution. The main attention is devoted to price regulation and pricing in network industries. Characteristics of the regulation are based on the basic form of pricing which is based on the allowed revenues defined as the sum of allowed costs, depreciation and allowed a profit, all variables are adjusted for parameter “market factor”.

At present, even in sectors which in the past were characterized by natural monopoly, the situation has changed so that businesses often meet competition in some of their activities. Regulation should contribute to a competitive environment in those market segments and business areas if it is possible.

Key words: natural monopoly, network industries, regulation

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Introduction

Economic theory describes social costs through monopoly deadweight loss. Monopoly production is generally lower than that of the allocation of output. A price equal to the marginal cost would ensure an allocation of efficiency. This simple and well-known theoretical concept needs to be "theoretically corrected" only by the fact that for a natural monopoly, the price equal to the marginal cost would be lower than the average cost, and the company is at a loss at that price .

The state is reacting to the inefficiency of monopoly by regulation. The main instruments of regulation of monopoly are from the theoretical point of view:

- antitrust legislation
- taxes
- price regulation
- state ownership.

This paper is concentrated on the price regulation.

1. Theory of the regulation

Stigler and Friedland (1962) made a significant contribution to regulation theory. They proved that even if result of the regulation is lower prices, this effect is not statistically significant. “The ineffectiveness of regulation lies in two circumstances. The first circumstance is that the individual utility system is not possessed of any large amount of long run monopoly power. The second circumstance is that the regulatory body is incapable of forcing the utility to operate at a specified combination of output, price” (Stigler, Friedland 1962 p. 11)

Peltzman, Becker and Knittel and Poulikkas mentioned importance of interest group for regulation theory. The interest group theory holds that, as economic agents, regulators will respond to the lobbying efforts of regulated firms Peltzman (1976), Knittel (2006). Gains to particular interest group are proportional to the group's lobbying ability and the potential gains from lobbying effort (Becker 1983).

The contracting and interest group theories fact, the greater the contracting inefficiencies regulation, the greater the potential gains of many interested groups. In this case, the two theories will positively well as increase the number of relevant interest contracting problems reduced the amount of providers had an interest in lobbying for the potential gains from state regulation would that so he state is the ultimate guarantor even if companies in the industry fail. In developed economies, this is particularly important in the consideration of security of supply (Knittel,2006).

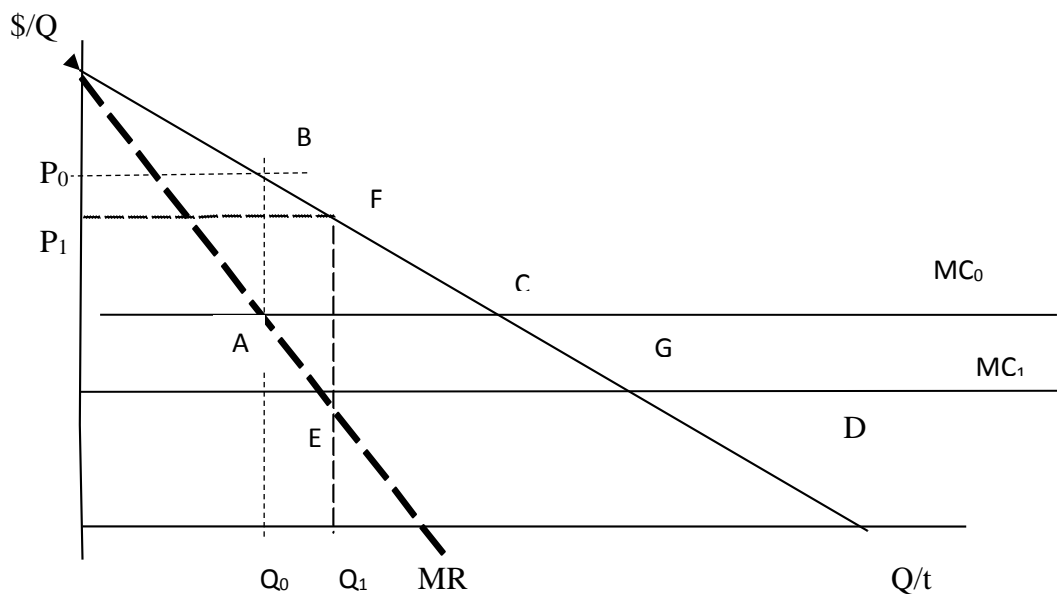
Priest (1993) argues that contracting costs influences regulation. He notes that with the growing minimum effective scale of company the number companies is lower and fewer companies reduce transaction costs. Next consequence is that in case of “municipal” regulation the corruption can reduce efficiency.

It is appropriate to distinguish ex post approach from ex ante approach to regulation. In case of the ex ante intervention, regulatory agencies have to take forward looking view of different business conducts and place restrictions on certain conducts. Thus, enterprises face less uncertainty due to regulation interventions.

Ex post approach is based on the competition approach and it is basically a harm-based approach. The regulated firm will be better informed than the regulator about the demand for the regulated services it supplies, the minimum possible current cost of delivering the services, and the potential for less costly future provision. (Armstrong and Sappington 2006)

Impact of the monopoly on efficiency is discussed taking into account innovation activity. (Reksulak, Shughart and Tollison 2008). Impact of the innovation on efficiency of the monopoly is illustrated on figure 1. We suppose linear demand and constant marginal cost for simplicity. When marginal cost are MC_0 optimal output is Q_0 and price is P_0 . Deadweight loss is represented by the triangle ABC. The Marginal cost decreases as a result of the innovation at the new level MC_1 , new output is Q_1 and price is P_1 . Higher output and lower price could increase social efficiency. But new deadweight loss is higher, as we can see from triangle EFG.

Fig.1 The Impact of Innovation on deadweight loss



Source: Reksulak, M -Shughart W.F. Tollison W.F Innovation and the Opportunity Cost of Monopoly, 2008), p. 621

We can draw similar conclusions in case of the natural monopoly; of course final result depends on character of cost changing. It is necessary to mention that the price

elasticity of the demand (monopoly power respectively) influences size of the price and output changes. That means it influences deadweight loss.

Reksulak, Shughart and. Tollison argued that the innovation-induced rise in deadweight loss should be ignored (or is at least of second-order importance) because consumer surplus simultaneously increases. The existence of this trade-off leads naturally to the question of how are the magnitudes of the changes in deadweight loss and consumer surplus. (Reksulak, Shughart and. Tollison 2008)

There are more methods of regulation, for example the Rate of return, Price cap, Revenue cap. Cost-based pricing have been dominating regulatory method of the price regulation in network industries (Major, Kiss 2011), but this approach has several problems.

The regulatory body usually does not have a correct information about cost of the firm. The result is that more effective firm has not higher profit and cost-based price regulation decreases incentives for the effort to reduce costs. Moreover the information asymmetry creates conditions for moral hazard and adverse selection. Because perfect information about the firms are not available, the regulator must devote some benefits in order to motivate effort and true obtain true information.

Poullikkas summarized some principles of regulation. “The economic power of suppliers is based on the ability for a group of supplier firms to exercise more bargaining power:

- When the input is, in one way or another, important to the buyer.
- When the supplier industry is dominated by a few large producers who enjoy reasonably secure market positions and who are not beleaguered by intensely competitive conditions.
- When suppliers’ respective products are differentiated to such an extent that it is difficult or costly for buyers to switch from one supplier to another.
- When the buying firms are not important customers of the suppliers.
- When one or more suppliers pose a credible threat of forward integration. The economic power of customers is based on the leverage and bargaining power of customers and tends to be relatively greater:
 - When customers are few in number and when they purchase in large quantities
 - When customers’ purchases represent a sizable percentage of the selling industry’ s total sales.
 - When the supplying industry is comprised of large numbers of relatively small sellers.

- When the item being purchased is sufficiently standardized among sellers that customers can not only find alternative sellers but they can also switch suppliers at virtually zero cost.
- When customers pose a credible threat of backward integration.
- When the item being bought is not an important input.
- When it is economically feasible for customers to purchase the input from several suppliers rather than one.”(Poullikkas 2016)

2 Regulation in Czech Republic

Energy Regulatory Office (ERU) is the main regulator of the network industries in Czech Republic and ERU's decision-making is influenced by European legislation. The ERU is required to regulate the price of related services in electricity and related services in the gas industry in such a way that the stated prices cover, among other things, a reasonable profit ensuring the return on realized investments in equipment used to perform the licensed activity.

The goal of regulation as well as the main problem is to determine a reasonable level of profit for businesses, ensure a sufficient quality of service provided to customers at cost efficiently, support future investments, provide resources for network renewal, and continue to increase efficiency.

These main requirements are placed on the methodology of the regulation:

- predictability of regulation for individual entities,
- the balance of regulation from the point of view of individual market participants,
- objectivity and transparency of the setting of regulatory principles and inputs,
- follow-up to valid legislative regulations of the Czech Republic and the European Union and their current change

Basic formula for calculate allowable revenue used by ERU is:

$$AR = AC + D + P + M$$

AC is allowable cost, D is allowable depreciation P is profit of licensee and M is market parameter.

Value of allowable costs for the regulatory period is based on actual achievements costs in the previous period. When using this method appears fundamental problem mentioned in relation to costs-plus pricing.

The adjusted allowable cost may be increased at the request of the provider by extraordinary costs that were not included in the initial value of the permitted costs, but the company will be demonstrably established in that year. Such costs may include, in particular, costs arising from, for example, in connection with incoming projects or the obligations of the provider.

The ERU includes, in addition to the parameters in the basic formula, other variables, such as the escalation factor and the efficiency factor.

The escalation factor is the time value index of the money, which adjusts the input parameters within the regulatory period for use in subsequent years

The efficiency factor is to simulate the influence of market forces in the regulated sector as it reflects productivity growth across the industry. Incentive regulation is aimed at motivating regulated companies to actively seek individual cost savings, which the regulated company can retain as an additional profit.

The ERU is required by law to proceed in such a way that the prices are at least cost-effective. The Office is of the opinion that, given the nature of the company providing the activities of the market operator, the profit should not be the main objective of the market operator's activity. However, the appropriate profit, which is the source for the development of the equipment necessary to carry out the licensed activity (not for the payment of dividends) is recognized by the Office.

The basic formula has to specify for particular case. Return rate - weighted average cost of capital (WACC) can be a good example . Main factors determining WACC are (see tab 1 in detail).

- Cost of equity
 - Risk-free rate
 - Market risk premium
 - Unlevered beta
 - Relevered beta
- Cost of debt, after tax
 - Risk-free rate
 - Cost of debt, pre tax

- Credit risk margin of debt
- Tax rate

Tab 1 Calculation WACC

Parameter of formula	Unit		
		Electricity distribution and transmission	Gas Distribution and Transportation
Risk-free rate	%	3,82	3,82
Market risk premium (MRP)	%	5,00	5,00
Unlevered beta	-	0,536	0,532
Relevered beta	-	0,901	0,801
Cost of equity	%	8,32	7,82
Risk-free rate	%	3,82	3,82
Credit risk margin of debt	%	1,38	1,38
Cost of debt, pre tax	%	5,19	5,19
Income tax rate	%	19,00	19,00
Cost of debt, post-tax	%	4,21	4,21
Debt / (Debt + Equity)	%	45,75	38,48
Equity / (Debt + Equity)	%	54,25	61,52
EUR gov 10Y	%	3,15	3,15
EUR FTSE Euro Corporate Bonds BBB	%	4,53	4,53
Credit risk margin of debt	%	1,38	1,38
WACC, Nominal value adjusted for tax (before tax)	%	7,951	7,940
WACC after tax	%	6,440	6,431

Source The principles of price regulation for the period 2016-2018 for the electricity, gas and electricity market operators in the electricity and gas sectors.

Conclusion

Regulation of the monopoly is not only theoretical problem. It has important consequences for market and efficiency. These conditions ensure efficient regulation

- Independence of the regulator body
- Transparency of regulation
- Investor and consumer protection

The regulatory authority must choose a methodology that meets all requirements for effective regulation. It must reduce the problem of cost based pricing.

It is important take into account than network industries require usually long term investments and ERU considers the horizon 15 years.

Network industries have often strategic importance for economic safety.

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