

Investment incentives: regulation of the Finnish electricity distribution

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Abstract

Investments into the electricity distribution network are needed to support competition and to guarantee the security of supply as well as a good quality of electricity. The aim of this paper is to study the ex post regulatory system in Finland in context of investment incentives. The second objective is to study how the investments in the sector have developed after the liberalisation and what seem to be the most important factors influencing investments in light of empirical information and how regulation affects them. The investment volumes vary much between years but on average, no drastic developments have taken place.

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1. Introduction

The liberalisation of the electricity market in many countries has created many new challenges that policy makers, utilities and customers have had to face. Electricity distribution systems form essential facilities so that the competitive generation can reach suppliers and customers. Due to the natural monopoly character of electricity networks, the network utilities and their investments require a significant element of regulation because of the prevalence of market failures.

In Finland, the electricity market was liberalised in 1997. For an international reader, Finland is an interesting object of study for one because it has been one of the countries, where the liberalisation was started at an early stage, and therefore, there is empirical information available for a longer period. In addition, the Finnish Energy Market Authority has developed an ex post regulation scheme, which is rather an exception in the international regulatory practise and this is why

the Finnish model is interesting to look at closer at an international forum.

Furthermore, according to international studies on benchmarking of electricity distribution utilities, Finland seems to have succeeded well and its industry has been more efficient relative to some other countries. (See e.g. Edvardsen and Førstund, 2003, Kinnunen, 2004 for recent studies.) Therefore, it is useful to look at investment developments in such “an efficient country” because there might be a risk that too much efficiency leads to too little investments. Finland also presents an interesting case due to a lot of available empirical information. For example, it is interesting to see that after the beginning of liberalisation until 2001 the return on equity on average has dropped by 50 percent but that it still is, on average, at a higher level than the reasonable rate set by the regulator.

There are several theoretical regulation methods, based on which most regulation schemes are built in practice. The main principles of regulation will be shortly described in Section 2 of this paper. The regulation method in Finland has been based on the ex post approach until 2003, which has to be changed in 2005 due to the new European Union energy directive.

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This paper presents the Finnish example in Section 3 focusing mostly on the earlier system, because the empirics can only be interpreted against the historical background. This paper concentrates especially on how the capital and investments were dealt with in the regulatory practice. The Electricity Market Act, based on which the market is supervised, sets the utilities an obligation to maintain and develop the network. The supervision of whether the utilities meet this obligation is, however, difficult. Therefore, it is necessary to address the issue of sufficient investments in the regulation for securing the good long-term development of the sector and the supply security.

The literature discusses the investment incentives most often in context of the ex ante price cap regulation¹ and less attention has been paid to the ex post systems although they also pose an interesting study object because they take a different approach that allows utilities more freedom. The aim of this paper is to study the ex post regulatory system in Finland in context of investment incentives. This issue is addressed in Section 3. The second objective of this paper is to study how the investments in the sector have developed after the liberalisation. The first part of Section 4 presents the historical development of investments. In the latter part, an OLS regression analysis has been executed in order to study, which factors mostly explain the investment behaviour of the utilities and whether these factors are those, on which regulation has a direct influence. Finally, a short conclusion will be made to review the main results.

2. Investment incentives in context of regulation theories

Yarrow (2003, p. 10) states that the “...fundamental duty of the regulatory authority is to protect the interest of the consumers...” i.e., to secure public interest (Baumol, 1995, p. 255). This is done by promoting effective competition where possible. The problem of regulation is finding the right mixture between regulation and freedom. When considering regulation, the opportunity cost of regulation should be taken into account. Thus, the cost of market failure should be weighed against the cost of regulatory failure. The regulators task is to find a balance between the interests of the consumers and the interests of the utilities’ investors and operators.

In the short term, this mainly means that the regulator should guarantee reasonable prices for consumers. However, the system should be attractive to investors as well. The sufficiently good quality of electricity supply is also in the interest of the consumers and, therefore, in the long term, prices should be at a level that provokes

the network utilities to maintain a good quality network as well as to attract investors.

Thus, considering investment incentives, the most relevant issue of regulation is to find a balance between an adequate return on invested capital and preventing excessive monopoly rents. Investment incentives should be considered with a *long-term perspective* because allowing the utilities a reasonable return is necessary in order to maintain a sufficient level of capital in the long term.

The principle problem of regulation is asymmetric information between the regulator and the regulated utility. The regulator always has incomplete information about the true cost and profit of the firm. Another problem is inefficiency because as a regulated monopoly industry the utilities have not necessarily an own incentive to improve their performance.

In practice, there are two approaches to regulation. Often it is distinguished between *bottom-up* regulation (e.g., the rate-of-return regulation)² and *top-down* regulation (e.g., price- or revenue-cap).³ There is also the difference whether the regulatory frames are set before or at the beginning of the regulatory period (ex ante regulation) or whether the performance of the firms in the sector is evaluated after or at the end of the period (ex post regulation). Often, the top-down regulation is based on the ex ante regulation and the bottom-up methods are based on the ex post approach.

The two most relevant approaches in the regulatory practice are the cost-based and incentive-based approaches that have different characteristics concerning investment incentives. The cost-based regulation methods consider regulation as a constraint of the firm’s profit maximisation. Usually, the regulator sets a fixed rate of return based on the rate base relying on information of some previous period. (Berg and Tschirhart, 1988; Knieps, 2001).

With a rate of return regulation, the main objective is to allow the utility sufficient revenues and a fair return on the fair value of the capital (Greer, 1992, p. 636). Setting the last two items is, however, a very critical issue of regulation because they determine the profit. Normally, the rate of return allowed in the regulatory practise is quite modest, because the electricity distribution industry is considered a low-risk industry. This might not attract investors looking for high returns.

The literature discusses the problem of the rate of return regulation that it might encourage utilities to invest into excessive capacity causing efficiency losses because the return depends on the size of the rate base, i.e., on invested capital.⁴ In reality, however, the

²See e.g. Baumol (1995), Berg and Tschirhart (1988), Greer (1992) and Knieps (2001).

³See e.g. Acton and Vogelsang (1989) and Laffont and Tirole (1993).

⁴This effect is called the Averch–Johnson–Effect. See e.g. Berg and

¹See e.g. Hogendorn (2003).

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