How can a natural monopoly be regulated?

Introduction

The purpose of this essay is to analyze the problems that natural monopolies cause and the solutions developed to solve these issues. Firstly, a brief definition of natural monopolies will be presented, followed by the problems that are associated with it. Secondly, various solutions such as the (RPI – X) rule will be presented, with comparisons among them. Lastly, a real life case study will be conducted to examine the practicality of the issues and solutions of natural monopolies. Throughout this essay, arguments, facts, and views will be presented with various sources such as academic journals, reports, and text books.

Natural monopoly is a type of monopoly. Monopoly is market situation in which there is a single seller of commodity of lasting distinction without close substitutes (Dwivedi, 2002). The definition of natural monopoly, while differed among economists, consists of similar characteristics, generally speaking (Waterson, 1987). For the sake of clarifying, the natural monopoly described in this paper will use the definition concluded here.

In (1969), Posner defined natural monopoly exist when “ A single firm can supply a good or service to an entire market at a smaller cost than could two or more firms, such as distribution of water.” Take water provision industry as an example, it requires a network of pipes, if two or more firms were to compete in the provision of this service, each firm would have to pay the fixe cost of building a network of pipes, thus the average total cost of water is lowest if a single firm serves the entire market.”

Walter (1979) emphasized that huge economies of scale is a crucial factor as the cause of natural monopolies. This statement was supported by McConnell's(1960) research, identifying the high fixed cost of the industry of natural monopolies. As more output are produced, the average cost can be lowered significantly due to the initial sunk cost compared to the variable cost. Because of that, a firm needs to operate in a relatively large scale in terms of output to achieve the minimum efficient scale (Hirschey, 2008). Such market would also discourage new entrants when there is already a pre-existing firm. It should be noted that the size of the market matters as it needs to be large enough for the natural monopoly to achieve economies of scale (Mankiw, 2003).

As a monopoly, natural monopoly faces little to none competition, thus allowing it to charge at the monopoly price, MR = MC. Even worse, natural monopolies are often found in the utility sector, meaning the demand would be inelastic and most consumers are likely forced to pay even if they find it over-priced (Cibinskiene & Navickas, 2011). As a result, the natural monopoly will charge high then free-market price, and a large number of consumer will be denied the utilities, creating a huge deadweight loss (Mankiw, 2003).

Another note-worthy problem of natural monopoly is the lack of innovation. With consumer's demand for essential goods and services, the natural monopoly would have strong incentive to focus on expanding the business to a larger scale to gain a higher overall profit, rather than improving the quality of its goods and services (Armstrong et al, 1995).

Regulation

With the aforementioned issues, consumers often pressure the government to regulate the pricing model of natural monopolies. There are three popular approaches: laissez faire, price-cap, and rate-of-return.

Laissez faire is one of the less proactive options among the three. It refers to the government not to interfere with the economy to uphold the concept of a free-market unless necessary. It is argued that when a natural monopoly fits the market in terms of effectiveness, its better not to discourage its efficiency through regulation (Seldon & Seldon, 1984). In contrast, some claimed that by not imposing as much regulation, the market may seem more desirable for new entrants, thus fostering competitions, and with it brings innovation and price reduction to gain competitiveness, which would ultimately benefits consumers (Ekelund & Hébert, 2003). Effectiveness aside, Kim and Horn (1999) added that the complexity of regulation on natural monopolies may proved to be problematic for developing countries that are inexperienced with such cases, and it may be more harmful to the economy if regulations are implemented incorrectly.

Under rate of return regulation, also known as the profit-cap approach, a revenue requirement is determined based on the firm’s accounting cost during a test year (Leland, 1974). A rate of return is then calculated based on the historical data. With it, the regulator can finds the appropriate price that the monopoly should have charged in a competitive market. This approach can effectively limit the natural monopoly’s profit, maintaining it at an acceptable in consumers’ point of view. Stelzer (1996) believed rate-of-return approach is more flexible than price-cap, as it cap profit instead of

price, it prevents privatizing companies from enjoying “ excessive” profit and pays them to its executives.

However, in (1962), Averch and Johnson pointed out that the rate of return regulation provides strong incentive for investors to over-invest capitals into the firms in order to raise the maximum profit permitted, this is later known as the Averch-Johnson effect. These additional investments are often for the sake of raising the profit-cap, instead of improving efficiency. This effect may causes firms to disregard cost, as a cost increase could be covered by a price increase, which recreate the problem of high price for consumers as a natural monopoly, even under regulation (Currier & Jackson, 2008).

Price-cap regulation, also known as the (RPI – X) rule, is a pricing regulation which restricts the maximum price a firm can charge based on various factors, under the price cap, the natural monopoly can adjust its products’ price freely (Armstrong et al., 1995). The price constraint is expressed as ptâ ‰¤(1+RPIâˆ’X)pt-1 , where

T = time period

RPI = the percentage growth in the retail price index

X = the expected rate in productivity growth

To further analyze, the (RPI – X) rule permits a firm to increase its price by an amount equal to inflation minus an amount equal to the expected productivity. According to Currier & Jackson (2008), this creates strong incentive for firms to increase its productivity growth that would surpass the expected rate to yield the financial “ reward”. To achieve that, firms could

implement whatever strategy that leads to productivity improvement, such as cost-reduction. More importantly, firms under (RPI-X) rule strive for cost-reduction and efficiency gain to achieve a higher profit, indirectly benefitting consumers(Liston, 1993).

As attractive as the price cap regulation may sound, there is a lack of quality control criteria in the price constraint, causing firms to produce products at an “ acceptable” quality only (Currier & Jackson, 2008). To take this into account, Sappington (2005) pointed out that some recent application of price-cap regulation has taken into consideration of quality, where the regulated firm is required to charge as product’s quality decline.

Regardless of the approach of either price regulation, it both requires precise and accurate data from the firm and the industry. Currier (2004)noted that strategic misreporting present a serious problem in price regulation, which ultimately leads to a welfare loss. It is important for regulator to consult multiple sources and acquire adequate knowledge regarding the industry before conducting the regulatory scheme. Unforeseen input price change would pose a financial threat as both approach uses historical cost in its formula (Currier & Jackson, 2008). Political pressure would also play an important role in these pricing regulation when the general public deem natural monopolies to be earning excessive profit (Yarrow et al , 1986).

British Telecom in UK

Prior to 1979, the UK possessed one of the largest public enterprise sectors in Europe. Privatization of public utilities first started in 1984 with British Telecom, followed by British in 1986, Electricity in 1989, and water in 1991

(Hossain, 2005). In this essay, British Telecom shall be focused for a detailed analysis.

Initially, the UK government had several reasons to privatize utilities. Firstly, privatizing utilities would yield substantial revenue for the government in the process. Secondly, it would lessen the burden of direct taxation on voters (Baldwin & Cave, 1999). As public utilities are continuously being privatized one by one, the problems of natural monopoly arise. Price exploitation poses a serious threat to consumers' welfare, especially in the transition period. As a result, price regulation is implemented. At that time, both rate-of-return and price-cap regulation are commonly known. While rate-of-return approach was more commonly used in the US market, the UK government prefers price-cap approach (Hossain, 2005).

A study published by Littlechild in (1983) to regulate British Telecom's profitability, which subsequently introduced the price-cap approach, also known as the (RPI – X) rule, into the UK. He argued that the price-cap approach could achieve something that the rate-of-return could not, which is to provide incentives to regulated firms to improve efficiency beyond regulator's forecast. This approach was later fully adopted by other privatized utilities in UK.

Soon after BT was privatized, a regulatory body was created, known as " Office of Telecommunications". As the regulator, not only must they look after the interest of consumers, they must also ensure the regulated firms are financially sustainable. The regulated firms are given the choice to appeal to the Competition Commission if they find the price constraint

unreasonable (Hossain, 2005). In addition, the previously mentioned lack of quality control of price-cap approach was acknowledged, and the regulators have the authority to weigh in the quality criteria in the licensing condition if they find it necessary.

Hossain (2005) has conducted a study on how price-cap affected BT’s operation. I997 – 1998, BT was required to reduce the price by RPI – 4. 5%, 4. 5% being the X. While it may seem a small amount, it actually equals to 44. 3 million pounds in BT’s revenue. BT had to reduce price on different type of calls in various proportion in order to meet the requirement.

Since 1991, the telecommunication industry has an increasing number of entrants; firms who are interested are given licenses to compete (Kay, 1996). Depending on the geographical coverage, the Office of Communication implement various range of price-cap on firms, BT receives a stricter price-cap in areas where it is still maintaining a monopolistic status (Oftel, 2001).

Although on paper, the UK government seems to favor price-cap approach due to its simplicity and strong incentive for firms to be effective. In practice, Armstrong

et al.(1995) questioned whether this approach has reached its expectation. The Department of Trade and Industry (1998) has also claimed that the price-cap approach still allows excessive profit to be made for firms that just entered post-privatization period. Till today, British telecom, a privatized utility, remains natural monopoly in some area. Under UK government

preference on the price-cap regulation, BT was able to enjoy profit if it managed to operate more efficiently than predicted.

Conclusion

Due to the characteristic of the industry a natural monopoly is in, it could charge a high price to gain substantial profit if left unregulated. Price-cap and Rate-of-return became two popular approaches to regulate privatized utilities. While ROR limits the maximum profit the monopoly could earn, it causes firms to over-invest and disregard cost. Price-cap, on the other hand, promotes productivity improvement efficiency gain, but lack a universal standard to control quality. Both approaches could suffer from inefficiency if information was misrepresented or if there was an unexpected rise in input cost. After a short analysis on British telecom and UK's history of privatization, price regulating natural monopolies seems to be necessary and beneficial. Eventually most markets are open for entry in the long-term to encourage price competition and innovation (Vogelsang, 2002). It also appears that the price-cap approach serves its purpose well enough, although some economists question its effectiveness. Although both pricing regulation has its pros and cons, there is a fundamental difference in both approach, and its effectiveness depends largely on the regulators' goal.

(Word Count: 1970)