

# The Study of Price Control in the Chinese Natural Monopolistic Industries in Order to Avoid A – J Effect

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**Abstract:** Because of the special technical and economic characteristics of natural monopolistic industries, it is generally in need of governmental price control to these industries. This paper discussed the low efficiency A-J effect under the price regulation based on the rate of return on investment and practiced the game theory of the government and natural monopoly corporation. On the base of theoretical analysis, the paper proposed effective methods to avoid the A-J effect and realize the reciprocity between government and natural monopolistic industries. Some selective methods are also suggested to perform the price regulation of Chinese natural monopolistic corporation. [The Journal of American Science. 2006;2(1):89-93].

**Keywords:** A-J effect; natural monopolistic corporation; price regulation based on the rate of investment return; price cap regulation; periodic censor system

## 1. Introduction

In order to prevent corporations from obtaining extra profit using monopolistic power which results in the net loss of consumers' residual and the social welfare, and guarantee consumers to enjoy the lowest price product, countries all around the world implement price control to different extent on the typical natural monopoly corporation such as telecommunication, electric power, mail, railway transport, tap water, coal gas, et. At present, among several more popular modes of price control around the world, the most typical mode is the rate of return on investment mode represented by America. This mode is a traditional price control mode and has a centuries-old history, which plays an important role in promoting corporations to increase capital input and extending investment. It has been studied and used for reference by many countries. However, the negative low efficiency A-J effect resulted from this mode is also a challenging difficult problem troubling controllers (government) and experts.

In China, government has implemented price control on the natural monopoly corporations which relate to the national welfare and people's livelihood such as telecommunication, electric power, railway transport, tap water, etc. The main mode of price control is cost mark-up pricing, which aims at reclaiming all cost and obtaining definitive target profit under the price established by corporations. According to the cost of corporations and the allowed target profit, government restricts the product price. If the unit cost is AC and

specified cost addition rate is  $r$ , the cost addition price of the product is  $p = (1 + r) \cdot AC$ .

Because serious information dissymmetry between government and corporations controlled and without effective exterior constraint system, the price control mode in China appears a number of similar phenomena to the 'A-J effect' resulted from the rate of investment return mode in America such as (1) the lack of motivation of promoting the natural monopoly corporations to reduce cost and increasing productivity which results in the waste of production resources; (2) the continuous increasing price of many natural monopoly operational productions which forces the consumers have to buy the production or service of the natural monopoly corporations under higher price and results in unreasonable distribution of social income and lower welfare level of all society; (3) the appearance of strange circle as "every year controlling the price every year making a loss, the more controlling the more loss, consequently, the more loss the more controlling" etc. In order to change the situations discussed above, the price control system for natural monopoly corporations (NMCs) must be reestablished in our country. This requires combining the real situation of the NMC in our country on the basis of the various price control modes in foreign countries and according to the basic economic theory, assimilating the outstanding experience about price control of other countries, avoiding its negative A-J effect and constituting the proper new price control system to realize the reciprocity between government and NMCs.

## 2. The connotative meaning of A-J effect

A-J effect is a low efficiency negative effect resulted from the price control mode of the rate of return on investment. Therefore, the analysis of A-J effect must start from the price control mode of the rate of return on investment, which is defined as that government does not establish the ultimate price of the NMC production directly, however, the profit in the price constitution is controlled by the established rate of return on investment, make the NMC could compensate the operational cost, then the price level of NMC is controlled indirectly. The price control model of the rate of return on investment is expressed as

$$R(p \cdot q) = C + S(RB) \quad (1)$$

where  $R$  is the function of corporation revenue, which defined as a function of the production price ( $p$ ) and quantity ( $q$ ),  $C$  is the cost fee (such as wage, tax and depreciation etc.);  $S$  is the rate of return on investment regulated by government;  $RB$  is the Rate Base, which means the total capital investment. The control price ( $P$ ) is equal to the total corporation revenue dividing out the total quantity ( $Q$ ) as  $P=R/Q$ . In the famous literature of Averch and Johnson (1962), named as "Behavior of the firm under regulatory constraint", the study showed that under the control of the rate of return on investment, corporations will generate a motivation of extend capital as large as possible and obtain more absolute profit under the regulated rate of return on investment. Consequently, in order to produce special productions, corporations will use overabundance capital investment to substitute for other input productions, which will result in the low produce efficiency. This phenomenon is called by later researchers as A-J effect.

## 3. The practice of some developed countries in avoiding A-J effect

From the viewpoint of the practice of some developed countries about price control on NMC, before the eighties of the twentieth century, the public natural monopoly industries investment and the insufficient supply is the main contradictory faced by government. Therefore, the developed countries mostly adopt the price control mode of the rate of return on investment of America, which has played an important role in the initial development and capital input for public natural monopoly industries. However, after the development of several decades till to the eighties of the twentieth century, the investment of public natural

monopoly industries and the insufficient supply is not the main contradictory anymore, the problem of over high cost and price is more outstanding and the A-J effect phenomena are more obvious. The increase of efficiency and stabilization of price have been the new focus of the price control system. To avoid the A-J effect, many countries around the world and researchers has explored and practiced a number of effective price control modes. Among which, the maximum cap price control mode of England aimed at increasing efficiency and reducing cost has become the dominating and most influencing mode gradually in the west.

The maximum cap price control mode of England adopts the  $RPI-X$  model with the innovation of combining the control price and the retail price index with the advancement index of the produce efficiency of corporations.  $RPI$  means the Retail Price Index, also named as the rate of currency inflation and  $X$  is a given increase percent of produce efficiency decided by controllers during a certain period. For example, if the rate of currency inflation is 5% in a certain year ( $RPI=5\%$ ) and  $X$  is fixed at 3% ( $X=3\%$ ), the maximum increase amplitude of price for corporations is 2%. This simple price control model means the nominal price established by corporations is determined by the relate value of  $RPI$  and  $X$ . If  $RPI-X$  is a negative value, the corporation must reduce the price with amplitude of the absolute value of  $RPI-X$ . Then, if the current price of a corporation is  $p_t$ , the next period control price ( $p_{t+1}$ ) is  $p_{t+1} = p_t(1 + RPI - X)$ .

England attempted to control price directly to avoid the insufficient of the model of the rate of return on investment of America. The basic advantage of this model is to inspire the corporations reduce cost to obtain more profit with the fixed price increase amplitude during certain period. Meanwhile, the rate of corporation profit is limited by the price control, which inspires the corporations implement optimize combination on the produce factors and avoids the over capital-intensive phenomenon under the price control of the rate of return on investment. Therefore, compared to the price control of the rate of return on investment, the price control model of England is more benefit to inspire the corporations to reduce cost and increase efficiency. The disadvantage of this model is to restrain corporation investment, especially when approaching the price regulation period, the investment motivity of corporations is much smaller even to stop, which will influences the continuity of normal investment.

#### **4. The selection of Chinese natural monopoly corporations to avoid A-J effect**

In order to avoid the A-J effect in China, the corporations must combine the real situation of Chinese natural monopoly industries on the basis of the various price control modes in the foreign countries and the base of economic theory as references, assimilate the outstanding experience about price control of other countries, establish the new price control model suitable to the real natural monopoly industries condition and set up the proper effective price control system to realize the reciprocity between government and NMCs. Aiming at solving this problem, four advices are proposed as follows.

##### **1) Reforming the present government price control system in China and introducing the inspiring price control mode**

The present cost mark-up pricing for NMC in China should be reformed into the price control mode of the rate of return on investment or the price cap control model. However, the corresponding regulations must be performed correspond to avoiding the disadvantage of these two models. If the price control mode of the rate of return on investment is adopted, we must establish the effective cost constraint mechanism and set up the corporation price cost account book (成本台账) gradually and make sure the control parameters of corporations to engage the corporations to reduce cost and improve efficiency by themselves. At the meantime, in order to prevent over investment, for the new projects of monopoly corporations or the new investing projects preparing to entry this industry, the correlative government department must audit these projects strictly and control the expansion of the total investment in practice. If the price cap control model is adopted, we must realize that the economy in our country is still at the turning state and the market condition still exist great gap compared with the west developed country such as America and England. Therefore, the inspiring regulation implemented in our country could not be the same as the west model absolutely and we must combine the real state of our country to make choice or revise. Especially in recent years, for the very low retail price index and negative increase in majority years (the RPI is negative), the selection of RPI-X model is not suitable obviously. But using the base theory of this model as reference, we could establish the new price control model suitable to our country's situation.

##### **2) Reinforcing the price formation reform and introducing the price competition rule**

At the aspect of reinforcing the price formation reform of natural monopoly industries, the focus core is persisting in market economy direction and eliminating the basic obstacles of bounding productive power radically. Two main aspects need to be considered: One is the Tax homing (税费归位). The fee and foundation which has the character of tax should be merged or changed into tax, such as airport construction fee, seaport construction fee and railway construction fee. For the administrative fee (administrative fee of government department), the corresponding management rules must be established completely and it should be brought into the national financial budget gradually. On the other hand, introducing the competition mechanism should be selected to break up monopoly of the branches and industries. The monopoly price and profit in natural monopoly industries baffle technical advancement and service quality improvement, damage consumers' benefit seriously and raise the social cost. However introducing the price competition rule is an effective way to accelerate the technical innovation of natural monopoly industries, increase the service variety and reduce the price. We should lay emphasis on motivating the price reform of natural monopoly industries such as basic industries and public institutions, introduce the price competition rule into the open competing industries and promote the monopoly industries to reduce cost, perform intensive farming and improve technical innovation. For instance, for the competition of China Unicom and China Mobile, the entering network fee (入网费) of mobile phone reduced from 20,000 to several hundreds Yuan since 1994 and free at present. The introducing price control system could be classified into three levels: 1) introducing the price competition into all the industries such as telecom, electric power and water supply etc.; 2) introducing the price competition into the interior of industries such as the "factory and network separation, price competition to entry network" (厂网分离、竞价上网) in the electric power branch; 3) introducing the price competition in certain domain of the industry such as the call service, IP phone, service machine trusteeship and other increased value business domain. The following table shows the classification of the competition tache (product) and non-competition tache (product) in the main monopoly industries of China.

Table 1. Classification of producing tache of monopoly industries

Industries	Competition tache	Non-competition tache
electric power	electric power generation, power supply	electric network, load distribution
Telecommunication	Long distance call, mobile call, data transport, increase value service, wireless call	Local call network, fiber optical cable network
Post	Mail express	mail network
Civil aviation	Civil aviation passenger transport, freight service, airport, aviation oil, materials	Flight line regulation, aerial regulation, aerial communication
Railway	freight service, passenger transport, large goods transport communication service, bridge construction	Railway network, communication network
Tap water	tap water production, supply, reclamation and utilization of sewage	Water supply line net
Coal gas	Coal gas production, retail, supply	Gas supply line net

### 3) Reinforcing the reform of natural monopoly corporations and establishing the modern enterprise system

In the high free market economy country represented by America and England, the ratio of national enterprises in the natural monopoly industries is very small. The objective of controlling the natural monopoly industries price by government is maximization of the social welfare, which is different from the corporation operational objectives of maximization of profit. Government considers the social benefit in priority, not the economic benefit of corporations. However, the situation is different in many monopoly industries of our country at present. They are almost the national corporations with politics-enterprise background (政企不分). In a long period China implemented the direct investment and monopoly operation rule on the national monopoly industries. Government is not only the decider and the surveillant of the control rules performance but also the practice manager. Under this control mode characteristic as the high unity of government and industry, (政企高度合一)

the objective of government control is the same as that of corporation operation, but contrary to the government's responsibility for society. Government is not only referee but also athletes, which leads to the phenomenon that when establishing the control rule on the natural monopoly industries, government must take into account the benefit of both corporation and society which is difficult to practice for the instinct contradictory. Therefore, in order to optimize price control of the national monopoly industries, the modern enterprise system must be established with the development of the reform and makes the monopoly corporations become the real modern corporations with clear property right, obvious power and duties, separated government-enterprise relation (产权清晰、权责明确、政企分开) and scientific management. Meanwhile, government control institution is only a monitoring functional department. Consequently, the procedure of general adoption of the market principle in natural monopoly industries will be promoted, the produce price will be reduced, the service will be improved and the consumers will obtain benefits ultimately.

### 4) Establishing the complement relative price

### control principles by government and performing scientific price decision democratically

To overcome the informational asymmetry between government and the regulated enterprises and avoid the possible corruption during the price decision procedure, when deciding the industrial price of natural monopoly enterprises, Chinese government should set up complement relative price control principles and perform scientific price decision democratically. As far as the authors are concerned, the chief price control department of government should establish or perform the four principles as follows strictly: 1) Setting up the scheduled censor system by the price department. Performing the periodical overall censor on commodities and services of NMCs tabulated in the price list. The censor contents include the total state of enterprise operation, manufacturing cost, periodic fee situation, wage level and labor productivity, which provide the important base for avoiding false cost and inverse price decision. (虚置成本, 倒逼定价) 2) Establishing the expert censor system organized by price department. By setting up the price censor expert library, when establishing the control price, the related experts and scholars are invited to audit the establishing and regulating price which will improve the scientific character of price decision. 3) Implementing the price hearing of witnesses system strictly. By implementing the price hearing of witnesses system strictly, selecting the various social areas, hierarchies and aspects widely to participate the hearing and listening to their advice, the hearing will be made as a procedure and a real system to control price and increase the scientific, democratic and normalized character. 4) Performing the group audit of government price decision system strictly. In order to make the price decision by government more scientific and normalized and avoid the camera obscura operation, practice graft and power seeking rent, (暗箱操作, 徇私舞弊, 权力寻租) the original national plan committee publicized the Government Decide Price Action Rule (trial implementation) 《政府制定价格为规则(试行)》 on Dec.16, 2001, regulated definitely establishment of the group audit of government price decision system for the entire in charge departments and the group audit price committee consisting of the interior correlative staff in the departments, clarified their duties and operational procedure. The implement

of fundamental price principle must be decided by the audit committee ultimately. However, this system is not implemented effectively at the surface (流于形式), the “price decision by three people” (“三人定价”) still exists popularly. The authors think that the group audit price system should be reinforced the penalty rule up to the legislation level and raise from the command of present director of National Development and Reform Committee to the administrative law of State Department, which should be added into the modified “Price Law” best.

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