Analysis of Environmental Law Enforcement Mechanism Based on Economic Principle

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Abstract: Strengthening and improving the environmental law enforcement mechanism is an important way to protect the ecological environment. This paper is based on economical principles, we did analysis of the marginal management costs by using Pigou means and the marginal transaction costs by using Coase means vary with the quantity growth of pollutant discharge Enterprises. We analyzed all this information, then we got the conclusion as follows. In the process of strengthening the environmental law enforcement mechanism, firstly, we should fully mobilize all aspects of environmental law enforcement, such as legislative bodies and law enforcement agencies, public welfare organizations, television, newspapers , enterprises, people and so on, they need to form a reasonable and organic structure system; then we should use various management means, such as government regulation, legal sanctions, fines, persuasion and denounce, they also need to form an organic structural system.

1. Introduction

With the rapid development of social economy in China, the function of the government has changed dramatically. From mainly through administrative means to mainly through economic means. Facing the increasingly severe ecological problems and the transformation of government functions, it is urgent to strengthen and improve the environmental law enforcement mechanism.

In recent years, many scholars have conducted a more in-depth study of the environmental law enforcement mechanism. By making the analysis of the application of economic instruments for environmental management in China, Mo Chuangrong (2005) pointed out three conditions for the implementation of economic instruments: legal guarantee, the effective market mechanism, the rationalization of government behavior; meanwhile he put forward seven suggestions to solve the issues of environmental management development. Xu Zhonglin(2013)pointed out that the three aspects are complementary to each other, forming a system of environmental law enforcement mechanisms, and jointly playing the role of environmental law enforcement. From the angle of "Ecologicalized law enforcement", Li Ainian(2016) pointed out some suggestions, such as perfecting the mechanism of government accountability, strengthening the power of administrative enforcement of law, strengthening the construction of law enforcement capability , establishing diversified law enforcement methods and so on. Sjöberg E.（2016）pointed out that politicians do not only affect environmental policy, but also that for a given policy, they can affect the outcome through implementation and enforcement. Stretesky (2017) provides strong empirical support for the hypothesis that the global environmental enforcement culture is shaped by competitive neoliberal tendencies. On the basis of previous studies, this paper explores and studies the environmental law enforcement mechanism of environmental

supervision departments in the process of increasing quantity of sewage enterprises from the perspective of economic principles, and provides theoretical references for the relevant departments.

2. Application of economic principle in environmental law enforcement mechanism

2.1 The Application of Pigou Means in Environmental Enforcement

The most important application of Pigou means in environmental enforcement is to levy shelter tax. Implementing negative incentives for the enterprises that produce negative external effects, such as environmental problems. Otherwise, implementing positive incentive, which is grant subsidies, for the enterprises that produce positive external effects. In order to obtain balance by applying Pigou means. Assuming that the remaining conditions are certain, the choice of optimal combination of environmental governance methods depends on the marginal transaction costs and marginal management costs in the process of environmental governance. In the application of Coase means in environmental protection, marginal transaction cost is the amount of transaction cost increase among enterprises by adding one more environmental pollution enterprise. In the application of Pigou means in environmental protection, marginal costs of management is the amount of total cost of the governance environment increase by adding one more environmental pollution enterprise.

2.2 Application of Coase Means in Environmental Enforcement

Based on the general sense of Coase means, if the property right is cleared, the transaction costs approach to zero. The allocation of resources will ultimately achieve to Pareto Optimality, achieving efficient market equilibrium regardless of the side of property. But in reality, transaction costs can't be zero. The more companies pollute, the greater the transaction costs will be. In the process of environmental governance, Coase means represents a negotiable or tradable license system. Pigou means focus on the government regulation while Coase means pays more attention to the role of market mechanism. Based on Kos theorem, the most effective and reasonable solution appears when the property right is clear, nointervention among different interests and resolve disputes by voluntary negotiation.

3. Economic Analysis of Environmental Law Enforcement Mechanism

3.1 Optimal choice model of economic measures of environmental management

Assuming that the technical level of the firm is constant, the amount of emissions is at the same level and there is no significant difference in the environmental benefits between the enterprises, regardless of the transaction costs of the beneficiaries that may bring about the efficiency of the loss and the use of monopoly for high returns of rent-seeking behavior, the choice of the best combination of environmental management methods depends on the choice of environmental governance in the process of marginal transaction costs and marginal management costs. If using the Pigou means to manage the environment, one more environment contaminated enterprise will increase how much the total cost of governance environment, the increase quantity of the total cost is the marginal management cost. Marginal management cost include the growth of management costs associated with the production of environmental-related institutions, the increase in monitoring costs of monitoring departments and the imposition or payment of taxes or subsidies; a rise in costs resulting from the polluting enterprises. If using the Coase means to manage the environment, how much more a sewerage company will add to the transaction costs, the increase in transaction costs is the marginal transaction costs. On the basis of government management costs without regard to government control, under the market mechanism, the interests of the parties through the use of voluntary consultation, the transaction costs include the cost of victims to understand the sewage business sewage situation, the cost of victim clear their own degree of damage and other information and the cost of the negotiation before. When using a sewage permit transaction, the transaction costs include the cost of finding the transaction object and the cost of the contract. The combination of the ways of environmental management can be optimized according to

Figure 3-1:

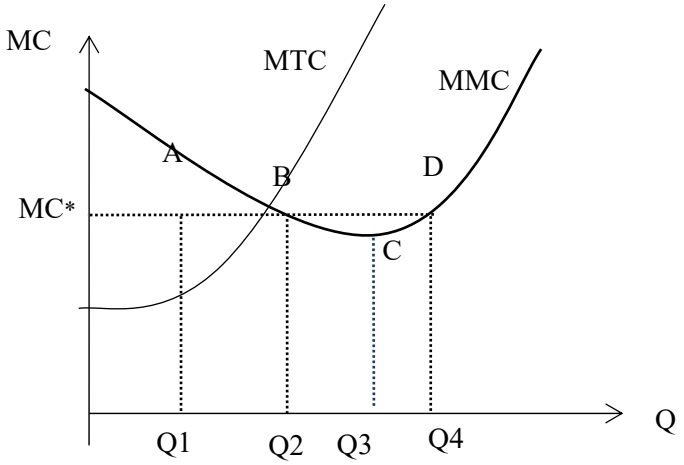

Figure 3-1. Optimal choice model of economic measures of environmental management[1]

As shown in Fig. 3-1, the horizontal axis represents the quantity of pollutant discharge Enterprises, represented by the letter "Q"; the vertical axis represents the marginal cost expressed by "MC". MMC curve represents the marginal management costs by using Pigou means vary with the quantity growth of pollutant discharge Enterprises，MTC curve represents the marginal transaction costs by using Coase means vary with the quantity growth of pollutant discharge Enterprises. As can be shown from the figure，the change of MMC curve was shown as "U" shape. In the process of the quantity of pollutant discharge Enterprises grow up from 0 to Q3, the curve leans toward the lower right until reduced to the lowest point "C"，This shows that marginal management costs continue to decline as the quantity of polluters increased. Then the MMC curve rises gradually from the point Q3, marginal management costs continue to rise as the quantity of polluters increased. Meanwhile, the MTC curve has been tilted upward, and the margin of inclination is increasing. That is, marginal transaction costs continue to rise with the increase of the number of enterprises, and the rate of increase is increasing faster and faster. This can be represented as a formula：

$$\frac{\partial^2 MTC}{\partial Q^2} \geq 0 \quad (1) \qquad \frac{\partial MTC}{\partial Q} \geq 0 \quad (2)$$

There is a critical point B in Fig.3-1, and the coordinate of this point is (Q2, MC*). That is to say, when the quantity of enterprises is Q2, the corresponding marginal cost is MC*. The B point is the intersection of the MMC curve and the MTC curve. At this special point MMC = MTC, it is the same to choose the Pigou means to control the environment, or to choose the Coase means to control the environment. The number of pollutant discharge enterprises Q2 corresponding to B point is the number of critical polluting enterprises. When Q is between 0 and Q2，the marginal transaction cost MTC is less than the marginal management cost MMC. At this time, Coase means should be chosen to govern the environment. If further refined: (1) When Q is between 0 and Q1，the number of pollutant discharge enterprises is very small，and the whole trading market is imperfect. In this case, the most effective way is to negotiate voluntarily among stakeholders.(2) When Q is between Q1 and Q2，the trading market is relatively perfect. In this case, the choice of emission permits trading is effective. In addition, Q1 is not a strict dividing point. The boundaries between voluntary negotiations and licensing are not clear.

When the number of pollutant discharge enterprises exceeds Q2，marginal transaction costs MTC

[1]Ma Zhong. Introduction to environment and Natural Economics [M]. Beijing：Higher Education Press, 2006

exceed marginal management costs MMC. In this case, Pigou means should be chosen in environmental governance. As can be shown from the figure, the change of MMC curve was shown as "U" shape. After dropping to the lowest point C, the curve began to pick up sharply. After the point C, choosing which method for environmental governance is an important matter. We should not only to consider the size relationship of MTC and MMC, but also to compare the government's management costs and control costs, when using Pigou means. As can be shown from Figure3-1, When Q is between Q3 and Q4, marginal cost is less than MC*. In this case, the use of Pigou means of environmental governance can be effective. But when the number of enterprises is greater than Q4，the marginal management costs will rise sharply and disputes among subjects of interest will soar. In this case, the use of economic incentives to control the environment will be ineffective. The best choice at this moment is adopting government coercive measures to carry out environmental governance.

3.2 Analysis of market mechanism improvement and government efficiency improvement

Suppose the MMC Curve is fixed, with the development of the marketing mechanism, as shown in Fig. 3-2, the MTC Curve will move rightly to the MTC' curve. Then the intersections of marginal management cost curve MTC and marginal transaction cost curve will move rightly from Point B to Point Y, the number of the pollutant discharge enterprises will grow up from Q2to Qy, adopted by Pigou means or Coase means. Suppose the MTC curve is fixed, with the improvement of the government's working efficiency and the environmental enforcement capacity, the MMC curve will go down to the MMC' curve, the intersection of the marginal cost curve and marginal transaction cost curve will move from point B to point Y' ,the number of the pollutant discharge enterprises will decline from Q2to Qy', adopted by Pigou means or Coase means, which means with the improvement of the government's working efficiency, the section of environmental management will be narrowed by using Coase means, which will be declined from Q2to Qy'. It also means the the section of environmental management will be widen by using Pigou means.

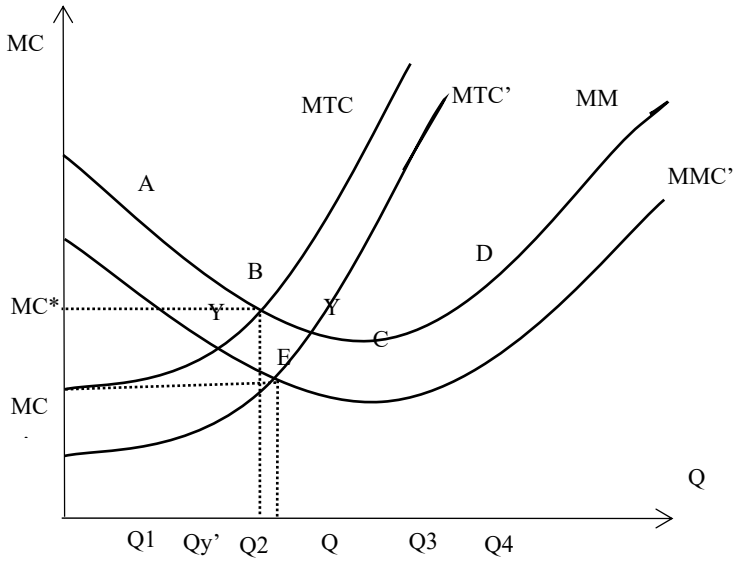

Figure 3-2. Reasonable structure model of environmental control measures[1]

If both the market mechanism and government's working efficiency are continuously improving, environmental awareness of citizens is also enhanced, then the MMC curve and the MTC curve will

[1]Ma Zhong. Introduction to environment and Natural Economics [M]. Beijing：Higher Education Press, 2006

move to MMC' and MTC'. Thus the intersection in the Fig. 3-2 will move from point B to point E. It can be shown ,there is little different between the quantity of pollutant discharge enterprises related to point B and point E .which means the influence of the Pigou means and Coase means on section of environmental management is the same. The marginal cost corresponding to point B to point E will decline from MC* to MC** during this decline process. The social force has also plays an important role. Therefore, in terms of the consideration of the settlement mechanism of environmental problems, apart from environment itself, the system background, political environment and social security should also be taken into consideration.

4. Conclusions and Suggestions

Based on the above analysis, we got the conclusion: In the process of strengthening the environmental law enforcement mechanism, on one hand, we should fully mobilize all aspects of environmental law enforcement, such as legislative bodies and law enforcement agencies, public welfare organizations, television, newspapers , enterprises, people and so on, all of them should play their own role to make up a reasonable and organic structure system；on the other hand, various management means, such as government regulation, legal sanctions, fines, persuasion, denounce, they also need to form an organic structural system.If regulation and economic incentives failed, in order not to cause chaos, it is necessary to give full play to the role of public forces in society, and put this force in a fundamental position. Apart from relying on the automatic regulation of government control by the "Pigou means" and the market mechanism by the "Coase means", we should also constantly improve people's environmental awareness and improve the informal institutions and social mechanism of environmental protection.

Above all we put forward the following suggestions: Continue to improve the market mechanism; Improve the efficiency and law enforcement capacity of environmental management department; Enhance public awareness of environmental protection; Improve environmental protection systems and measures; Establish and improve environmental guidance and encouragement mechanism; When necessary, the government should adopt compulsory means to carry out environmental management.

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