

Predatory Pricing: Economic and Legal Aspects

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Table of Contents

<i>Introduction</i>	<i>4</i>
<i>1. Identification of the predatory pricing problem and its definition</i>	<i>6</i>
<i>1.1 Identification of the predatory pricing problem</i>	<i>7</i>
<i>1.2 Definitions of predatory pricing</i>	<i>7</i>
<i>2. Existing economic theories of predatory pricing</i>	<i>10</i>
<i>2.1 The Irrationality of Predatory Pricing--- The Chicago theory of predation</i>	<i>11</i>
<i>2.2 Criticisms of the Chicago School rationale</i>	<i>13</i>
<i>2.2.1 The rational decision-maker</i>	<i>13</i>
<i>2.2.2 Game-theoretic approaches</i>	<i>14</i>
<i>1) Deep pocket and financial distress-incentive models</i>	<i>16</i>
<i>2) Signaling-type models</i>	<i>20</i>
<i>Reputation signaling model</i>	<i>20</i>
<i>Limit pricing and cost signaling models</i>	<i>23</i>
<i>3) Other models</i>	<i>26</i>
<i>2.3 Experimental evidence on rationality of predation</i>	<i>28</i>
<i>2.4 Additional considerations</i>	<i>30</i>
<i>3. Reconsideration of the economic theory of predatory pricing and its possible solutions</i>	<i>32</i>
<i>3.1 The objective of economic agents: profit maximization</i>	<i>33</i>
<i>3.2 Other objectives of economic agents</i>	<i>36</i>

3.3 Possible solutions	36
4. Existing framework of antitrust law and related legal rules about predatory pricing and its influences on China's policy making	38
4.1 Framework of antitrust law about predatory pricing in the U.S.	38
4.2 Collection of existing legal rules for predation	40
* No rule	41
* "Per Se" Rules	41
* Other tests	43
4.3 Inspiration for the legislation of China price antitrust policy	43
5. Predatory pricing in China and suggestions on related policies	45
5.1 Current status of predation in China	45
5.2 Essential elements to a workable predatory pricing approach in antitrust price law in China	46
6. Conclusions	49
References	52

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Introduction

Predatory pricing has been one of the most controversial business practices in the industrial organization and competition policy literature and can be traced back to the U.S. Standard Oil case in 1911. The idea of predatory pricing sounds quite straightforward and intuitive: a dominant firm harms competition by driving out existing rivals or excluding potential ones using a fairly low price, called predatory price, and then enjoys a higher profit in the post-predation period. But how low is fairly low, i.e. predatory? There is no unanimous agreement about this issue. To economists and policy makers, it has been a troublesome problem ever since.

China is now in a process of drafting its antitrust price statute to try regulating this behavior. This paper aims to research this question based on the existing economic theory and legal framework and attempts to provide some useful suggestions suitable to China's economy and policy making.

During the process of collecting the related material concerning predatory pricing, I have got an impression that both the economic theory and judicial practice about this subject are not mature and what we can borrow from this research to develop a more

useful theory and policy is limited. We should keep in mind that the objective of the antitrust policy regulating predatory pricing is to facilitate efficient and effective competition so as to increase the welfare of the entire society. So it is necessary to distinguish predatory pricing from normal price competition which can facilitate competition and thus benefit consumers and society as well. Bearing this in mind, I try to define predatory pricing in the paper in a way that is more inclusive.

Inevitably, economists have been heavily involved in the whole process of the evolution of predatory pricing theory and there exist two kinds of theories: The traditional non-rational theory of the Chicago school and the so called Post-Chicago economics. Many traditional models are static in nature or at best only suggest some incomplete dynamics. For example, the Chicago's attack on the rationality of predatory pricing simply neglects several important elements, such as reputation effects, signaling effects and asymmetries in information or financial resources. Since the 1980s, the research on predatory pricing has taken a new approach. The strategic basis and logical feasibility have undergone rigorous rethinking arising from developments of game theory and a deeper understanding of the role of imperfect information, which may yield predation as a profitable and rational strategy for firms. Hence emerged the so called Post-Chicago theories which try to resolve the theoretical inconsistency in predatory pricing and develop a rational predatory pricing theory. But even the so called new rational theories are not developed and persuasive enough which explains why no single theory dominates

the debate.

Although a number of scholars----including Areeda and Turner (1975), Bork (1978), Baumol (1979), Posner (1976) and Williamson (1977)-----have contributed to this discussion, predation needs to be further investigated. So the aim of this paper is twofold: first, to review the identification of the predatory pricing problem and the evolution of the related economic theory; second, to consider the predation problem in China and the need of competition law to address predation practices and put forward some suggestions regarding antitrust policy in China.

The paper is structured as follows. The first section discusses the identification of the predatory pricing problem and then tries to give it a definition after reviewing the existing influential ones. The next section is about the evolution of predatory pricing in economic theory. I will discuss the rationality theories of it and at the end of that section the experimental evidence related to the rationality of predation will be briefly introduced. The third section is about some instructive rethinking of predatory pricing in economic theory and its possible solutions. In the fourth section, the paper introduces the existing legal system in the U.S. and examines the legal tests regarding predation and then discusses their influence on China's policy making. The following section is about how to construct a workable antitrust price law regarding predatory pricing in China based on its existing status of predation. Then the last section will conclude the paper.

1. Identification of the predatory pricing problem and its definition

1.1 Identification of the predatory pricing problem

Predatory pricing is a kind of malicious market behavior that harms society as a whole. The definition of predatory pricing seems to have gained some kind of agreement that it is generally used to describe some strategy pursued by the firms interested in monopolizing the market for some product, usually in the form of low price.

To correctly define predatory pricing, it is necessary for us to distinguish competitive pricing from predatory pricing. The two concepts are often confused. In both cases, a firm cuts its price with the aim to gain additional sales. But in the case of competitive pricing, a higher profit is obtained even at a lower price and the new price is supposed to continue so long as the rival's prices are unchanged. But for predatory pricing, the firm bears an economic cost in the current period with the expectation of recouping the costs through higher prices later if the rival changes his actions. So there is almost unanimity that predatory pricing is an unfair and improper market action which prevents free market competition and harms society.

1.2 Definitions of predatory pricing

While wordings of definitions of predatory pricing vary, the general idea of them is consistent. The following are some of the influential ones. Areeda and Turner (1975) state that:

Predation in any meaningful sense cannot exist unless there is a temporary sacrifice

of net revenues in the expectation of greater future gains. Indeed, the classically-feared case of predation has been the deliberate sacrifice of current profits for the purpose of driving rivals out of the market and then recouping the losses through higher profits earned in the absence of competition.¹

According to Posner (1976),

...the most useful definition of predatory pricing is the following: pricing at a level calculated to exclude from the market an equally or more efficient competitor. Only two practices fit this definition. The first is selling below short-run marginal cost... Unfortunately, measurement problems make this definition of the forbidden practice difficult to apply [to promotional sales, for example]²

Bork (1978) defines predatory pricing as:

a firm's deliberate aggression against one or more rivals through the employment of business practices that would not be considered profit-maximizing except for the expectation that (a) rivals will be driven from the market, leaving the predator with a market share sufficient to command monopoly profits, or (b) rivals will be chastened sufficiently to abandon competitive behavior that the predator finds inconvenient or threatening.³

Joskow and Klevorick (1979) use the following rather simple definition:

Predatory pricing behavior involves a reduction of price in the short run so as to drive competing firms out of the market or to discourage entry of new firms in an effort to gain larger profits via higher prices in the long run than would have been earned if the price reduction had not occurred.⁴

Baumol (1979) defined predatory pricing like this:

any reduction in price, or any other decision, should be judged non-predatory if and only if it is profitable for the incumbent in the assumption either that the entrant is

¹ Phillip Areeda and Donald F. Turner, "Predatory pricing and related practices under section 2 of the Sherman Act", *Harvard Law Review*, 1975, v 88, p698

² Richard A. Posner, *Antitrust Law: An Economic Perspective*, University of Chicago Press, 1976, p188

³ Robert H. Bork, "The Antitrust Paradox: a policy at war with itself", New York: Basic Books, 1978, p144

⁴ Paul L. Joskow and Alvin K. Klevorick, "A framework for analyzing predatory pricing policy", *Yale Law Journal*, v89 (2), 1979, p213

there to stay indefinitely or that the probability that the entrant will withdraw is fixed”⁵ And in the abstract of the same paper, he writes that “pricing is predatory only where the firm foregoes short-term profits in order to develop a market position such that the firm can later raise prices and recoup lost profits”⁵

Finally, Ordover and Willig (1981) have given a more general definition of predation:

... that predatory behavior is a response to a rival that sacrifices part of the profit that could be earned under competitive circumstances, were the rival to remain viable, in order to induce exit and gain consequent additional monopoly profits. (The definition applies only to behavior that may cause existing rivals to exit the industry; behavior that merely deters entry is beyond its scope).⁶

As these definitions illustrate, it is difficult to give an accurate and unanimous definition of predatory pricing. The common intuition is that this behavior intends to make high future profits while sacrificing present profits to lure or force rivals to leave the market or stop entering the market. Based on the above definition, it is important to consider the welfare consequences of predatory pricing. I define predatory pricing as follows: Predatory pricing is a pricing strategy adopted by the predator which will harm overall social welfare, usually in the form of un-normally low price, to sacrifice profits in the short term and impose losses on rivals with a view to excluding rivals, or preventing or deterring entrants, leaving the predator firm with less constrained market power and resulting in yet higher market prices. Predatory pricing involves temporarily pricing a product low enough to end a competitive threat. Here we need to pay attention to two

⁵ William J. Baumol., “Quasi-permanence of price reductions: a policy for prevention of predatory pricing”, *Yale Law Journal*, v89(1), 1979, p1

⁶ J. Ordover and R. Willig, ‘An economic definition of predation: pricing and product innovation’, *Yale Law Journal*, 1981, v.91(8), p9

points: the first is the exclusion of rivals on a basis other than efficiency (using predatory pricing) in order to protect or acquire market power; the other is about the recoupment. Only when the dominant firm expects the recoupment in the future will predatory pricing be a meaningful action. The forms of predatory pricing are varied and too narrow a definition --such as using price-cost criteria-- will exclude some predatory behaviors from our discussion. In order to define predatory behavior, we should consider all kinds of factors, such as subject intent.

2. Existing economic theories of predatory pricing

There is a heated debate among economists on the rationality of predatory pricing. In general, the debate divides economists into two broad groups, one is the famous "Chicago School", the other we call the "Post-Chicago School".

The classical theory of predatory pricing considers predation in a static setting. A dominant firm whose aim is long run profit maximization sells below cost to eliminate rivals and subsequently earns a monopoly profit. Economists doubt this simple theory because of fundamental flaws in its logic.

Chicago School critics of the classic predation theory have argued that the circumstances under which predation can succeed are very limited, that rational firms will therefore rarely attempt it, and hence that predation is not a significant policy problem. Chicago scholars' analyses of predation focus on the high costs of predation to predators

and the risk of recoupment in the post-predation period. In their point of view, predatory pricing is rarely a profitable strategy for the incumbent and therefore its rationality is doubtful.⁷ The main argument is that predatory pricing is extremely costly in the short run and the recoupment of the high cost in the predatory period is very uncertain because of the possibility of reentry or new entry induced by the higher price.

Although the Chicago School skepticism of predatory pricing remains influential today, we later discuss efforts to undermine it by the so called post-Chicago School economists who view predation as a genuine threat to competitive markets.

2.1 The Irrationality of Predatory Pricing--- The Chicago theory of predation

The first famous article which expressed the idea that predation is irrational and so must be rarely observed in the real world was written by John McGee in 1958.⁸ McGee examined the famous 1911 Standard Oil case and showed that Standard Oil did not engage in predatory pricing because it would have been irrational for it to have done so. McGee's contribution to the predatory pricing research was to think through the logic of predatory pricing. Other Chicago Scholars, such as Bork (1978), argue that the similar reasons why predatory pricing tactics are irrational, thus, are rare in reality. Their

⁷ The representative articles of Chicago Scholars are: John S. McGee, "Predatory Price Cutting: The standard Oil (N.J.) case", *Journal of Law and Economics*, 1958, v1-6, p137; Robert H. Bork, "The Antitrust Paradox: a policy at war with itself", New York: Basic Books, 1978; Frank H. Easterbrook, "Predatory strategies and Counterstrategies", *University of Chicago Law Review*, 1981, v48, p263-337

⁸ John S. McGee, "Predatory Price Cutting: The standard Oil (N.J.) case", *Journal of Law and Economics*, 1958, v1, p.137

arguments can be summarized as follows⁹:

First, such practices are very costly for the dominant firm. The predator firm will incur the largest losses by virtue of having the largest volume of sales not only because of the lower price but also because of higher demand caused by the price decrease. Second, no one knows how long a price war would last. The prospect of incurring losses indefinitely in the hope of someday being able to charge monopolistic prices is not very promising. A price war is an extremely risky venture. Third, if exit from the market by the victim is easy, so will be entry and reentry. These new rivals may arrive on the scene so quickly that the below-cost pricing turns out to have been a losing investment. Fourth, merger, if legally permitted, is often a cheaper way of removing a rival than predation. Finally, the opportunity cost of the funds allegedly used to try to bankrupt rivals must be taken into account. For predatory pricing to be rational, the rate of return on predation must be higher than the market rate of interest. Predation is unlikely, given the great uncertainties about whether it would have any positive return at all. Besides, Easterbrook (1981) argues that the victim should have other sources of aid either through the capital markets or through being acquired by its own financially strong backer. Customers of the victim should also help.

From the discussion above, we can see that the strongest argument of the Chicago

⁹ The reasons are conclusions from the following classic articles: John McGee, "Predatory Price Cutting: The standard Oil (N.J.) case", *Journal of Law and Economics*, 1958, v1-6, p137-169; Robert H. Bork, "The Antitrust Paradox: a policy at war with itself", New York: Basic Books, 1978; Frank H. Easterbrook, "Predatory strategies and Counterstrategies", *University of Chicago Law Review*, 1981, v48, p263-337

School against the rationality of predation is perhaps the infeasibility of recoupment. There is no reason to adopt predatory pricing without expectation of successful recoupment, so there is no danger of monopolization and thus of consumer harm in the future. Besides the classic points of the Chicago school, there are some new developments using new theories to rationalize predation. Lott (1999) argues that firms engaging in predation must ensure that managers who proceed with costly predatory strategies are not penalized financially or ousted from office for doing so. Based on an empirical analysis of firms accused of predation in the U.S. between 1963 and 1982, Lott concludes that these firms didn't have the necessary contractual and non-contractual arrangements in place to give managers the incentives to commit to predatory strategies.¹⁰

2.2 Criticisms of the Chicago School rationale

Although the analysis of Chicago School's rational theory sounds reasonable, many economists question some of the basic assumptions and concepts taken for granted by Chicago scholars.

2.2.1 The rational decision-maker

Current analysis of predatory pricing is based on the assumption that the firms possessing perfect information have profit maximization as their target and behave as economically rational agents accordingly. Economic rationality is the orthodox

¹⁰ See John R. Lott, "Are predatory commitments Credible?" ch2, University of Chicago Press, 1999

economics' conception of rational behavior. It defines economic rationality by maximization of exclusively materialist objectives, namely profit by producers and utility by consumers. However, the rational behavior of human agents is far from being invariably utility-optimizing or profit-optimizing, and thus cannot be automatically reduced to economic rationality. Admittedly, in its current versions rational choice theory is "not a general [social] theory because it uses a much too rigid and narrow conception of rationality"¹¹. This narrow conception grossly neglects both the logical possibility and the empirical evidence that human behavior can be rational not just on economic criteria but also on extra-economic ones. Neglected is thus the incidence and salience of non-economic rationality in favor of its economic form. That rational behavior exhibits both economical and non-economic rationality. Hence, human behavior can be not only economically rational but also non-rational in economic terms and yet rational in non-economic ones.¹²

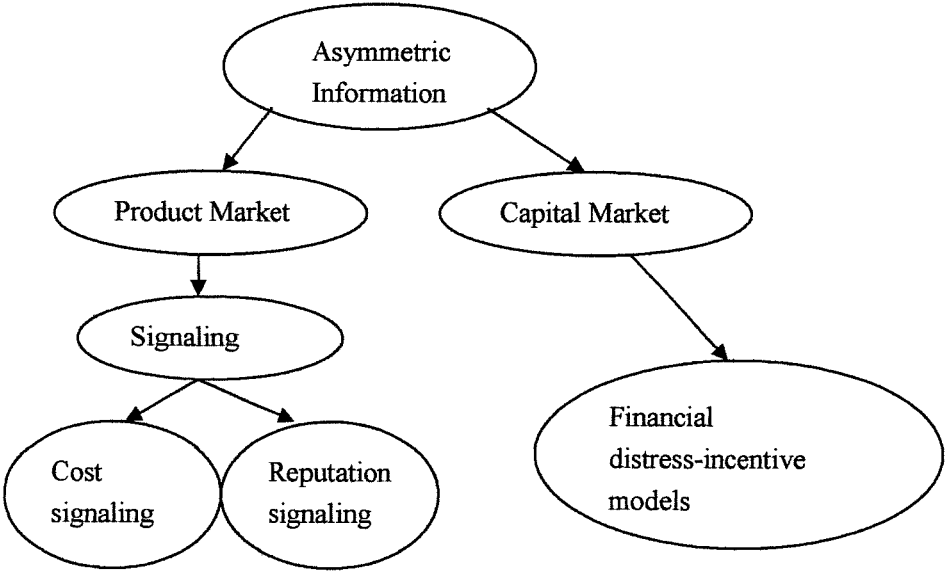
So Chicago Scholars' theories will be challenged if we have a new knowledge about the human being's traits, that is, we might reach a totally different definition for a rational person. Based on this possibility, predation might be rational.

2.2.2 Game-theoretic approaches

¹¹ Boudon, R., "Limitations of Rational Choice Theory", *American Journal of Sociology*, 1998, v104, p821

¹² Concluded from: Milan Zafirovski, "Human Rational Behavior and Economic Rationality", *Electronic Journal of Sociology*, 2003, ISSN: 1198 3655

From the discussion of Chicago School's point of view, they have argued that, in general, predation is unlikely because there will typically be little realistic possibility of recouping the economic losses. However, the strategic basis and logical feasibility have undergone rigorous rethinking arising from developments of game theory and a deeper understanding of the role of imperfect information. This has offered two kinds of models of markets in which predatory pricing emerged as part of a set of equilibrium strategies, namely, financial distress-incentive models and signaling-type models. Signaling-type models include signaling-cost and signaling-reputation models.¹³ These two types of models have identified some mechanisms through which temporarily low prices can reduce future competition and thereby increase profits and thus suggested that predation is logically possible. All of them derive from asymmetric information imperfections, as figure 1 shows:



¹³ Note that Ordover and Saloner (1989) divide predation theories into three areas: deep pocket, reputation and signaling.

Figure 1: relationship of the rational models

1) Deep pocket and financial distress-incentive models

The traditional deep pocket model, the simplest and most intuitively appealing theory of predatory pricing involves a firm with access to ample capital driving out a rival by setting prices below cost. To prove that financial structure may affect output market decisions, one transmission channel refers to the strategic bankruptcy effect. It captures the behavior of firms who use their output market decisions to drive their rivals out of the market: A firm with substantial financial resources (deeper pockets) can sustain losses for a longer period of time than its weaker rivals. This is known as the “deep pocket” theory of predation; this theory has a long informal history. Fudenberg and Tirole (1985), Ordoover and Saloner (1989) and Bolton and Scharfstein, (1990) are the main contributors to this theory.¹⁴ According to the theory, capital market imperfections can affect product market competition and thus create the possibility for predation. Telser (1966) has analyzed the “deep pocket” theory in a perfect-information environment.¹⁵ More recent contributions demonstrate how predation can occur in equilibrium if information is imperfect and if the dominant firm’s financial resources are substantially greater than any potential rival’s and enable it to outlast any competitor. For example, Fudenberg and Tirole (1985) explained deep pocket predation that relies on imperfections in capital

¹⁴ The related discussion can refer to: D. Fudenberg and J. Tirole, “Predation without reputation”, Working Paper 377, Massachusetts Institute of Technology, 1985; J. Ordoover and G. Saloner, “Predation, monopolization, and antitrust”, Ch9 in the *Handbook of Industrial Organization*, 1989, v1, North Holland; P. Bolton and D. Scharfstein, “A theory of predation based on agency problems in financial contracting”, *American Economic Review*, 1990, v80, p93-107

¹⁵ Lester G. Telster, “Cutthroat Competition and the long purse”, *Journal of Law and Economics*, 1966, v9, p259-77 was one of the first to discuss this deep pocket effect

markets. The asymmetric information between the firm and its creditors¹⁶ implies that creditors will not extend unlimited credit which may give rise to predation because the victim firm must finance its investment on the capital market while the predator is self-financed. Asymmetric information plays a key role here by influencing financing by the predator and the victim.

However, this theory has its own limitation in explaining the rationality of predation, especially when the victim may face the possibility of cross-subsidization. Cross-subsidies are traditionally a concern when a firm operates in several markets, one or more of which is a monopoly. It is only rational when the predator expects that the long run predation profit will exceed the sacrifice of profits in other markets. Besides, we must take into consideration that the competitors themselves who operate in multiple markets can use cross-subsidization to finance themselves. Second, the foundation of the argument is not stable; one of the main assumptions that the prey has inadequate capital and has no access to other funds is questionable. Easterbrook (1981) suggests supposing the prey will have ample access to capital too.¹⁷ In the process of predation, an efficient prey with no extra funds should be able to borrow funds to launch counterattacks against predators because they are efficient and more profitable at the predation stage and look attractive to investors. Third, besides all the limitations of the conventional deep-pocket

¹⁶ The profit of the firm can either high or low, and its actual value is not directly observable by the lenders. Thus management can misappropriate the profit, and then claim that profit was low when in fact they were high or vice versa.

¹⁷ Frank H. Easterbrook, "Predatory strategies and Counterstrategies", *University of Chicago Law Review*, Spring 1981, p269-270

theory, there still is another one: if all parties are equally informed of each other's characteristics (such as costs, profits and financial situation), predatory pricing should never occur in equilibrium.¹⁸

However, one can doubt whether a predator will adopt the predation strategy under this theory to drive out efficient preys, even if we suppose that predators have deeper-pockets. Why don't they use those funds to improve production efficiency or to enhance product quality? Not only does improved efficiency or quality directly add to profits, but rivals cannot match these as easily as they can match price cuts. Besides, the predator cannot prevent entry of rivals in a situation of imperfect information if the predator doesn't know the financial constraints of the rivals. In this situation the recoupment is at question. We can see that the deep pocket theory suffers from some serious limitations.

The financial distress-incentive model is the modern equivalent of "deep pocket" models, but provides clearer insight into how predatory pricing might work. The main difference between these two models is that the former concerns the emphasis on the way that financial distress distorts incentives and affects behavior. For example, the debtors obviously have an informational advantage over their creditors, and are aware about the potential credit available. Debtors attempt to adopt more risky strategies with the debt level because they know that the banks will bear the loss while the shareholders will

¹⁸ Telser argued this point in "Cutthroat Competition and the long purse"; more recently, J.P. Benoit, "Financially constrained entry into a game with incomplete information", 1984, *Rand Journal of Economics*, v15, p490

enjoy the success. But it is really hard for the creditors to find out the true situation of the debtors. So here the usual way of dealing with risk doesn't work, as it merely exacerbates the underlying financial distress and increases the distorted incentives for owners and managers. So the financial incentive-distress model creates a picture where the incumbent who faces a rival may be able to cause the rival's lenders to withdraw funds, and this shows that predation might be successful not because of the deep pockets of the incumbent, but because of the impact that debt has on the entrant's incentives. The focus on incentives shows that the greater the information asymmetry, the stronger the lender's incentives to take out the fund. Thus, based on the new theory, predatory pricing may be particularly successful against the small firms equipped with threatening products.¹⁹

2) Signaling-type models

The second set of models analyzed below concerns signaling: in the presence of asymmetric information, an incumbent can use a low price to signal that its cost is low, or if the rivals are not convinced by the low cost, the predatory price at least can signal a reputation for predation in the future or in other markets. There are two types of models included: reputation signaling models and cost signaling models.

Reputation signaling models

¹⁹ The financial distress-incentive model is based on Bolton and Scharfstein, "A Theory of Predation Based on Agency Problems in Financial Contracting", *American Economic Review*, March 1990, March 1990, v80, p93-106

An incumbent can build a reputation for toughness using predation and hence discourage potential entrants from entering other markets (different in either time or location). To acquire and then maintain such reputations may be costly in the short-run, but in the long-run the benefits may outweigh the costs. This is known as the reputation signaling model and it has significant intuitive appeal. According to the Chicago scholars, predation is rarely a profitable strategy and it is more profitable not to price predatorily, but the incumbents do feel unhappy when they cannot deter entry by threatening credibly that they will prey on the entrant. So if we take into account the effect of the prey on the behavior of future entrants, predation might be profitable.²⁰ Preying or not has an effect on the reputation of the incumbent, so predation might be a rational action; even though it is not profitable in a particular market, it might be profitable overall. So reputation signaling theory says that predation is used to maintain or build a reputation of being strong and thus a reasonable explanation of the rationality of it.

Selten's chain-store paradox started the research of the reputation models of predation.²¹ By using backward induction Selten (1978) demonstrated that, contrary to the intuitive understanding, preying can never form part of an equilibrium strategy, not even in the earliest stages. In this game, there lies the paradox - one can show that the unique Nash equilibrium in the finitely repeated game is the chain-store playing weak at each stage. Yet this is counter to most people's intuition: If there are many interactions,

²⁰ This point is put forward by B.Yamey, "Predatory Price-cutting: Notes and Comments", *Journal of Law and Economics*, 1972, v15, p129

²¹ R. Selten, "The chain-store paradox", *Theory & Decision*, v9, 1978, p127

the chain-store ought to play tough a few times in order to gain a reputation for toughness. If this reputation can be gained, then the opponents anticipate tough play and respond accordingly, yielding benefits that may outweigh the costs.

Since Selten first presented this paradox, there were many attempts to try to solve it by modifying the model in such a way as to demonstrate that predatory behavior can be rational. Some modifications of the Selten's assumption will change the results. A modification of this chain-store model is to extend the number of markets to infinity. A consequence of such an extension is that the backward induction mechanism ruling out predation breaks down. Milgrom and Roberts (1982) show that the strategy profile in which the incumbent always preys upon entry unless he shared in at least one of the previous markets, constitutes a perfect equilibrium.²² But Selten's assumption of a fixed number of markets or potential entrants is more realistic.²³

To establish plausible predation in these circumstances, some asymmetric information is required. Milgrom and Roberts (1982) demonstrate that the incumbent always preys upon entry unless he shared in at least one of the previous markets, and entrants stay out unless there was sharing in at least one of the previous markets; this constitutes a perfect equilibrium.²⁴ However, Milgrom and Roberts also show that there

²² Paul Milgrom and John Roberts, "Predation, reputation and entry deterrence", *Journal of Economics Theory*, v27, 1982

²³ In objecting to the infinite potential entrants model, Ordover and Saloner (1989), "Predation, monopolization, and antitrust", state on p533 that "in many practical situations, such as rivalrous entry into distinct geographic markets, the number of potential entrants is finite".

²⁴ Paul Milgrom and John Roberts, "Predation, reputation and entry deterrence", *Journal of Economics Theory*, v27, 1982, p280

is more than one perfect equilibrium in this game. Predatory strategy is one, and so is accommodation. Although this model does not demonstrate that predation is the only rational strategy, it shows that it is rational whenever the entrants adopt the appropriate strategies. Kreps and Wilson (1982) also used asymmetric information to explain the reputation effect. They change the assumption about the type of information available to the predator and prey, and thus the result of the chain-store paradox is different even with a finite number of potential entrants.

All of the models discussed so far give some plausibility to predatory pricing generally by using the so called 'reputation effect'. Besides, they also refute McGee's and other Chicago scholars' point that predation is irrational and should never occur in reality because a merger is a better choice to eliminate rivals. But here, in a situation of multiple potential entrants, a merger instead of fighting may in fact encourage, not deter, future entry. A policy of preserving monopoly by buying-up rivals may possibly be inferred from the purchase of a particular rival; and the purchase may then have the unfortunate effect of encouraging potential entrants to enter and to offer themselves as willing sellers, thereby progressively diluting the original owner's share of the monopoly profits. A policy of using predatory pricing, either regularly or occasionally is likely to have a more discouraging effect.²⁵

Of course, no single model is perfect and neither are the reputation models. Posner

²⁵ See B. Yamey, "Predatory Price-cutting: Notes and Comments", *Journal of Law and Economics*, 1972, v15

(1976) rebut that entry will occur notwithstanding the existence of incentives to establish a reputation.²⁶ Because the assumption in the reputation models that the entrants only enter one market at a time is flawed, a little modification of the assumption will change the results. Suppose the entrants decide to enter the potential markets at the same time, then predation is not a rational strategy for the incumbent to follow because the predator cannot gain from the reputation of toughness.

Limit pricing and cost signaling models

Bain (1949) suggests that an incumbent firm may set low prices in order to discourage entry.²⁷ According to Milgrom and Roberts (1982), limit pricing involves charging prices below the monopoly price to make new entry appear unattractive. Limit pricing and predatory pricing are different in the understanding of many economists. The main difference lies in that the former is using a pre-entry price to discourage potential entrants while the latter is using a post-entry price to drive competitors out of the market. But in this paper, I give predatory pricing a more general definition of setting a low price to deter entry of potential entrants or cause exit of current competitors. From the definition, it is clear that predatory pricing includes limit pricing as a special case. So in the paper, it is not necessary to draw a clear borderline between them.

If the potential entrants or the existing rivals are rational decision makers with

²⁶ See Richard A. Posner, *Antitrust Law: An Economic Perspective*, University of Chicago Press, 1976, p186

²⁷ See J. Bain, "A note on pricing in monopoly and oligopoly", *American Economic Review*, 1949, v39, p448

complete information, pre-entry prices and post-entry prices will not influence their entry or exit decision. So, the cost signaling scenario obtains when an incumbent using low prices to signal to rivals that it has lower costs than it actually has. If costs and demand are related to prices and the entrants have less information about these, the incumbent can use a low price to influence the entrants' decision and make them believe that exit is a better choice than continuing to face the dominant firm. This kind of asymmetric information can result from different knowledge regarding demand and market characteristics, technology and production, etc.

Milgrom and Roberts (1982) offer a seminal model of limit pricing based on asymmetric information.²⁸ Ordover and Saloner (1989) offer a model to demonstrate that signaling may result in predation upon an existing competitor.²⁹ In those models, what the incumbent can do is to signal his cost to try to influence the rivals' estimate of its cost type, then influence their decisions of exit or enter. This is possible because the cost is private information and this information is related to the price. So in this case, it is rational for the incumbent to set a low price to convince the rival that its cost is lower than the real value; hence the incumbent can continue enjoying the monopoly profit if it successfully deters entry or drives out the competitor. This model just matches the definition of predation that involves an increase in long-run profit for the predator at the

²⁸ See Paul Milgrom and John Roberts, "Limit pricing and entry under incomplete information: an equilibrium analysis", *Econometrica*, 1982, v50, p443

²⁹ See J. Ordover and G. Saloner, "Predation, monopolization, and antitrust", Ch. 9 in the *Handbook of Industrial Organization*, 1989, v1, North Holland

expense of reduced short-run profit. The incentive to signal will depend on the trade-off which in turn depends on the amount of the price cut and on the actual cost structure of the incumbent.

So the incumbent can adopt this strategy that is so costly to make the entrants believe they do have lower costs. Although the rivals will realize that the incumbent has an incentive to do this, without enough information about the market and the incumbent's cost, it is risky for them to just ignore these signals, and the model suggests the entrants are more vulnerable to signaling disruptions. In my opinion, the signal model might be more useful to explain how to deter entry than to explain how to cause exit, because once rivals have entered the market and produced their own products, they may have more understanding of the industry and have more than one method to estimate the costs besides price. At last, if rivals are still not certain about the strategy adopted by the incumbent, and then signaling just creates a reputation which is the second scenario we have discussed above. Indeed, entrants often hesitate to enter just because they are uncertain about the incumbent's condition when facing predation.

3) Other models

Even after all the efforts of the post-Chicago scholars, the rationality of predatory pricing is still questioned. The main arguments include: 1) There should be a superior method which is legal to achieve monopoly power compared with price cutting (McCee,

1958). McGee pointed out that merger might be a better method for the predator to adopt (after a review of the status of theory of predation, McGee concluded that this argument still held in 1980); and 2) If a takeover is expected, a pre-merger price cutting is simply a waste of the wealth of the related parties and is judged irrational by Telser (1965) and Bork (1978).³⁰ The general question is why would rational firms choose the very costly predation strategy when there is a better choice?

So there are some other theories besides those we have discussed above which appear to be used to explain the rationality of predation. Yamey (1972) responded to these criticisms by arguing that it is possible that the terms of merger be affected by predatory pricing, that is, the predator can get more favorable terms if he adopts predation first, which is called “softening up” process, and these favorable terms make predation rational.³¹ Building on Yamey’s work, Saloner (1987) presents a theoretical model of predation as a softening up process in order to secure favorable terms for an acquisition. And he argues in the conclusion of the paper:

Even if a merger between two firms is legal and anticipated, it may be preceded by a price-cutting episode. The price-cutting serves two purposes. First, it convinces the rival to sell out on favorable terms. Second, it signals to potential entrants that entry is unprofitable. Even in those circumstances where a merger is inevitable and entry is blockaded, price cutting may nonetheless precede a merger. Here the only purpose of the price-cutting is to improve the takeover terms. Thus, where asymmetric information is important, two fundamental arguments of the “Chicago School” fail to

³⁰ See Robert H. Bork, “The Antitrust Paradox: a policy at war with itself”, New York: Basic Books, 1978 and L. G. Telser, “Abusive trade practices: an economic analysis”, *Law and contemporary problems*, v30, 1965, p488-505

³¹ See B. Yamey, “Predatory Price-cutting: Notes and Comments”, *Journal of Law and Economics*, 1972, v15, p129-142

hold.³²

The “Softening up” version of predatory pricing definitely improves welfare relative to the symmetric information case, but this improvement is sensitive to the assumption that the merger will occur no matter what happened in the predation period. So the only question is the price at which the takeover will take place, which has no implications for social welfare. Compared with the duopoly price that would be charged in the perfect information situation, the low-cost acquirer can obtain a more favorable price by adopting a low price at the beginning which will improve social welfare.

A more recent contribution by David Roth (1996)³³ applies the solution concept of rationalizability³⁴ due to Bernheim (1984) and Pearce (1984)³⁵ to show that predation is rationalizable and is therefore rational even when there is no uncertainty in the structure of the game. We have noticed that the models we discussed above are all based on structural uncertainty ---a cost level, a demand condition, access to financing, or innate preference to fight--- instead of strategic uncertainty, that is, when there is a lack of coordination about the strategies being played by the rivals. Roth thinks that using this method is more intuitive to explain many economic phenomena, for example, price wars

³² See Garth Saloner, “Predation, Mergers, and Incomplete Information”, *Rand Journal of Economics*; Summer 1987; v18(2), p165

³³ See David Roth, “Rationalizable predatory pricing”, *Journal of Economic Theory*, 1996, v68, p380 -396

³⁴ The notion of rationalizability introduced by Bernheim (1984) and Pearce (1984) captures the implications of common belief (CBR henceforth) or common certainty of rationality (CCR henceforth) in a strategic form game. In extensive form games, however, it is in general impossible to maintain common certainty of rationality at every information set. CBR or CCR means that every player is rational, everyone assigns probability 1 to the event that everyone else is rational, everyone assigns probability 1 to the event that everyone else assigns probability 1 to the event that everyone is rational, and so forth. In strategic games, CCR is equivalent to common knowledge of rationality.

³⁵ See B. Douglas Bernheim, “Rationalizable strategic behavior”, *Econometrica*, 1984, v52(4), p1007-1028 and D. Pearce, “Rationalizable strategic behavior and the problem of perfection”, *Econometrica*, 1984, v52, p1029-1050

may not be optimal forms of enforcing collusion in oligopolistic super-games with imperfect information (see Abreu et al (1986)³⁶), but rather coordination failures in the setting of market shares. In the paper, Roth does successfully show that predation is rational even under strategic uncertainty.

2.3 Experimental evidence on rationality of predation

As discussed above, Chicago school scholars argue that predation is rare and irrational, while the new theories argue that predation is a possibly rational behavior. We should be able to reproduce it in the laboratory if this strategy exists in reality.

Issac and Smith (1985) are the first who have tried to use experiments to prove that predation exists in single market designs.³⁷ They define predation as setting price below marginal cost, which is the main reason why no predation was found in this experiment. So this experiment has little connection to the rational models we discussed above because it is strictly a short-run criterion for a single market whereas predation is inherently a dynamic and multi-market concept. Issac and Smith's results have had a deep influence. For example, Carlton and Perloff (1990) conclude that "from the evidence cited earlier, it is still correct to regard price predation as a rare "phenomenon".³⁸

In contrast, some economists try to set experiments which can test more complicated

³⁶ See D. Abreu, D. Pearce, and E. Stacchetti, "Optimal cartel equilibria with imperfect monitoring", *Journal of Economic Theory*, 1986, v39, p251-269

³⁷ See R. Mark Isaac and Vernon L. Smith, "In Search of Predatory Pricing", *Journal of Political Economy*, April 1985, v93 (2), p320-45

³⁸ D.W. Carlton and J.M. Perloff, *Modern industrial Organization*, Glenview, III, Scott, Foresman, 1990, p411

rational theories of predation in a single market design. Jung, Kagel and Levin (1994) are a case in point. They set up an experiment which is similar to the Kreps and Wilson framework but they rejected a number of predictions of the asymmetric-information, sequential equilibrium.³⁹ Harrison (1988) modified Isaac and Smith's (1985) market and developed an experiment in a multiple market set up.⁴⁰ Although Harrison only ran one session with this experiment, he did find evidence of predation. Holt (1995) then concludes that Harrison's "behavior existence proof" for predation would be more convincing with replication in a survey.⁴¹ So Goeree and Gomez (1998) make some efforts to realize such a replication using a modified Harrison's five market design. With these changes in the market design, they succeed in finding a consistent pattern of predatory pricing in most markets, which is a "behavior existence proof" for predation in multiple market design.⁴²

The results of all these experiments depend on the design characteristics. Predatory pricing is not observed in Isaac and Smith's single market design but the other modified experiments do produce predatory pricing, which suggests that predatory prices can be generated reliably, both in stylized signaling games and in rich market settings.

³⁹ Yun Joo Jung, John H. Kagel and Dan Levin, "On the Existence of Predatory Pricing: An Experimental Study of Reputation and Entry Deterrence in the Chain-Store Game", *Rand Journal of Economics*, v25 (1), p72-93, Spring 1994

⁴⁰ Harrison modified Isaac and Smith's market structure in a clever manner; he implemented five simultaneous posted-offer markets with eleven sellers, each of whom could enter only one market at a time. Details see G. W. Harrison, "Predatory pricing in a multiple market experiment: A note", *Journal of Economic Behavior and Organization*, v9, p405-417

⁴¹ See Charles A. Holt, "Industrial Organization: A survey of Laboratory Research", in J. Kagel and A. Roth (eds), *Handbook of Experimental Economics*, Princeton: Princeton University Press, 1995, p349-443

⁴² See J.K. Goeree and R. Gomez, "Predatory Pricing in the laboratory", University of Virginia, draft, 1998

2.4 Additional considerations

After careful consideration of the discussion above, the so-called new rational theories of predatory pricing seem more reasonable. Although none of them dominates the research agenda now, it represents a trend of development comparable with the classical Chicago school theory.

To conclude, the main ideas of Chicago school's theory about predatory pricing are:

1) predatory pricing is rare; 2) predatory pricing is irrational; 3) the price antitrust law will hurt normal price competition and the benefit of consumers from enjoying the low price.

However, these arguments are not sufficient to induce us to accept the irrational theory of predation. Firstly, we cannot simply neglect a problem just because of its infrequency. In fact, many policies and laws are meant to regulate "rare" phenomena.

Secondly, as discussed above, irrational behavior itself is defined in many different ways. I believe that the starting point of predatory pricing is rational, which is to pursue maximum profit. But for many reasons, such as the different objectives of managers and stockholders because of the separation of ownership and control, or the mistaken assessment of rivals' strength because of imperfect information, predation may not succeed. We cannot claim that predation is irrational because of the failure of most of predation behaviors; we can only say that predation is not successful in these cases.

Thirdly, the primary objective of the antitrust law is “to promote full and fair market competition and to reap the benefits that competition brings with it” or “to discourage monopoly, monopolization and associated monopoly behavior and the inefficiencies they generate”.⁴³ If we ignore the harmful behavior of predatory pricing, this is equivalent to admitting that all kinds of price competition are inculpable and this runs counter to the intent of antitrust law. As long as the behavior does harm to the benefit of the society as a whole and this behavior should be regulated by the law, price competition is not an exception. The Chicago scholars’ point that regulation of this kind of price competition policy will harm the consumer’s benefit sounds reasonable, but if we combine the present benefit and the long run benefit of consumers, I doubt that this argument can be tenable anymore because consumers will pay more in the future than what they gain today.

The key issue of this problem is how to distinguish normal price competition from predatory pricing. This is a very difficult problem to answer and is the main reason why some economists gave up regulation of predation because of the cost-benefit consideration. In fact, to find the evidence of predation, or even to define predatory behavior is not easy in practice.

Until today, none of the recently developed theories of predation have been

⁴³ The views of motivation of antitrust law vary. Here Joskow and Klevorick (1979)’s view was adopted. See Paul L. Joskow and Alvin K. Klevorick, “A Framework for analyzing predatory pricing policy”, Yale Law Journal, v89(2),1979, p220

embraced by antitrust law. Judge Klevorick has lamented that “the lack of impact that the recent equilibrium models of predation have had on the development of antitrust law concerning predatory pricing is unfortunate”. So apparently, the debate about the rationality of predation will continue.

3. Reconsiderations of economic theory of predatory pricing and its possible solutions

Until now, I have discussed the evolution of predatory pricing research. In this section of the paper, I want to combine economic theory and economic phenomena during the development process of China, discuss some reconsideration of the predation problem: try to analyze the causation of predatory pricing using classical economic theory and modern organization theory. Based on these discussions, some conceptions about this problem in China are introduced.

China is currently in a process of transformation from a planned economy to a modern market economy and we are far from being able to claim that China has constructed a mature market system at present. When researching the internet by using the keyword “predatory pricing or predation”, I cannot help noticing that predation in the form of price wars is a highly frequent practice used by firms in this progress. It exists in almost every industry in China, such as Telecom, the TV industry, the electronic appliance industry, the automobile industry and even the estate industry.⁴⁴ Although

⁴⁴ “Confused Market Price”, Economic Digest (China), Jan. 2001, p1

consumers are now enjoying a relatively low price, many economists are worried about the consequence of this and note the need for a price policy to regulate this market practice. As we discussed above, we know that malicious price competition using predatory pricing is an un-normal economic phenomenon, so the first question here is why it can occur with such a high frequency in China.

3.1 The objective of economic agents: profit maximization

The price war in China is out of the range of normal price competition and often evolves to malicious price competition, usually labeled predatory pricing. Many firms adopt a low price with the intent to drive out existing rivals or deter potential rivals. According to classic economic theory, firms act as profit maximizers. Because of the requirement of profit maximization, firms should adopt a strategy such that marginal revenue will equal marginal cost. Since price is the average yield, it will be larger or at least equal to marginal cost or marginal revenue. With enterprises unlikely to price at a level lower than marginal cost, predation should not occur.

There are four basic market structures: perfectly competitive markets, monopolistically competitive markets, oligopoly and pure monopoly markets. In the pure monopoly market, there is only one producer, so predation won't exist in this market structure, although limit pricing may be observed.

In a perfectly competitive market, the price is determined by the intersection of the

industry's demand and supply. The single firm is just a price taker. In this case, the average and marginal revenue equal the price. In the short run, a firm's profit can be equal to, bigger or less than zero, and the firm may not produce at the minimum efficient scale. In the long run, the equilibrium is attained through free entry and exit. In this case, all the firms produce at the lowest level of long term average cost which is equal to the marginal cost and market price; so predation is unlikely in this market structure.

In a monopolistically competitive market, the supply of producers is determined by the profit maximization principle while the price is determined by the demand curve. In the short run, the enterprise's profit can be equal to, larger or less than zero in equilibrium, and the enterprise may not produce at the lowest level of average cost. In the long run, through free entry or exit of the enterprises, each enterprise earns a zero long run economic profit, and the industry price is equal to long run average cost which is not the lowest level of average cost and is bigger than the marginal cost. Again, predation is unlikely in this case either.

The essence of the oligopoly market structure is that the number of sellers is small enough so that each seller is aware of the identities of its rivals and recognizes that its output and price decisions affect their decisions. Because of this mutual awareness among oligopolists, there is no definitive solution or outcome to an oligopolistic market structure. Oligopolists do not always seek to "soften" competition by cooperating with their rivals. Competition may be attenuated and profits increased by several aggressive actions, such

as predatory pricing. Although these practices involve short-term costs, the strategies may ultimately result in enhanced market power and profitability to the dominant firm.

By analyzing the four kinds of market structures, predatory pricing is most likely to emerge in an oligopolistic market. As will be discussed below, this is consistent with the practice of predatory pricing in China. For example, the most severe price war exists in the telecom industry, which is an oligopolistic market composed of seven telecom service providers.⁴⁵

3.2 Other objectives of economic agents

In the classical economic theory, the ultimate objective of the producer is profit maximization. But in modern organization theory, the objective of a particular entity is a more complex system, especially under the separation of ownership and control. Predatory pricing can be a probable strategy even if it is not in the interests of stockholders. The decision making process itself is much more complicated due to the separation of ownership and control, and this can probably cause the objective to depart from profit maximization. Furthermore, according to agency theory, under such circumstances the interests of management and stockholders may diverge, which might result in the adoption of a predatory pricing strategy. For example, the price will be

⁴⁵ No.75 file, "About further supervising and managing the telecommunications markets", the National Standardization Department of Ministry of Post and Telecom of China, Dec. 2003

greater than marginal cost if management pursues profit maximization; while the price might be less than marginal cost if the objective is revenue maximization.

3.3 Possible solutions

Fortunately, we can rely on the market economy to restrain the behavior of management and reduce the divergence of interest between management and stockholders. In a mature product market, the price signals supply and demand information about the product, and the pricing behavior which violates the supply and demand law cannot be sustained in the long run. Secondly, a sound capital market can guarantee the free flow of capital and free entry and exit, which makes disequilibrium between demand and supply unlikely to persist. Besides, in such a market, the stockholder can exit the unsatisfactory firms by simply selling their stocks, which will induce management to take the stockholders' interests into consideration. At last, an efficient and flexible market for managerial skill will encourage managers to behave in the interest of the stockholders.

However, a market economy is not a panacea for all market imperfections, and predatory pricing is no exception, hence the need for government intervention. The market economy and the legal system cannot be separated as all economic systems are governed by the rule of law. The rule of law has two economic functions. First, it regulates and limits discretionary interventions of the State in economic activities. Secondly, it regulates the economic behavior of individuals and enterprises to create an

orderly, stable environment with fair competition, clearly defined and well protected property rights, and effectively enforced contracts. To regulate unlawful behaviors such as predatory pricing, China now needs to construct a modern market economy on the basis of the rule of law. It's not only a requirement of the internal market but also a requirement of the globalization of the economy.⁴⁶

The legal system in China regarding predatory pricing is awfully backward relative to the requirements of the market economy. The government of China has taken different measures to regulate predatory pricing. For example, one means that the government used to regulate this practice is to set a price cap (minimum prize) for each industry, which is called the industry self-restrained price. This price cap is based on the average cost of each industry. This rule has no basis in microeconomic efficiency or in competition policy. Every economic entity has its own cost, so price regulation based on particular cost information would be more appropriate. This government behavior might even harm normal price competition as a result.⁴⁷

Now China is in a process of drawing out a "price antitrust statute". In this process, lessons should be learnt from the judicial practice of the developed countries. In the remainder of the paper, I will first introduce the existing advanced system of antitrust laws about predatory pricing and the related legal rules to distinguish predatory pricing

⁴⁶ Summarized from: Lu, Fucui. "The Economic Explanations of Malicious Price War", *Contemporary finance and economics(China)*, Oct.2000

⁴⁷ No.75 file, "About further supervising and managing the telecommunications markets", the National Standardization Department of Ministry of Post and Telecom of China, Dec. 2003

from normal price competition. Then I will identify what we can borrow from them to build a useful and practical framework to regulate predatory pricing in China.

4. Existing framework of antitrust law and related legal rules about predatory pricing and its influences on China's policy making

4.1 Framework of antitrust law about predatory pricing in the U.S.

Here I choose the U.S. as an example which is a typical framework of the competition law because all the developed countries' legal systems share the same basic features. In the U.S., the regulations of predatory pricing rests primarily on two federal statutes.⁴⁸ Section 2 of the Sherman Act of 1890 makes it a felony for any person to “monopolize, or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several States, or with foreign nations...”.⁴⁹ In addition, section 2(a) of the Clayton Act of 1914 as amended by the Robinson-Patman Act in 1936 which detailed and broadened the provisions, renders price discrimination unlawful when it may substantially lessen competition, tend to create a monopoly or injure, destroy or prevent competition.⁵⁰ In particular primary line discrimination, i.e. local price cutting and cognate practices that a firm employs to injure its rivals may be considered predatory.⁵¹ In fact, both statutes

⁴⁸ Although this discussion considers only federal law, predatory pricing is also subject to the antitrust and trade practices laws of individual states.

⁴⁹ Sherman Anti-Trust Act, 15 USCA, s2

⁵⁰ Clayton Act, s 2(a), as amended by Robinson-Patman Price Discrimination Act, 15 USCA, s 13(a)

⁵¹ OECD, p66

share the same idea about the damage caused by predation. Litigation against predation according to anti-trust law can take three ways in the U.S.: a suit brought by the anti-trust division of the Department of Justice, civil action by the Federal Trade Commission or litigation by private citizens.

The predation cases governed by these laws have a long history and they cannot come to a consensus. Different courts give out different standards about predation in different cases.⁵² Before the Areeda-Turner rule (price-cost rule) was set out in 1975, predatory pricing allegations were often dismissed. The other major change which embodies a new era in the case law in America is the 1993 Brooke Group Case.⁵³ The case is about allegations of predatory pricing by Brown & Williamson against a smaller rival in an effort to discipline the pricing of generic cigarettes. In this case, the court adopted a two-stage criterion: first, the alleged predator must set price below average cost and second there must be proof of subsequent recoupment of lost profits during the predation period.⁵⁴ The outcome of the Brooke case definitely raised the difficulty in proving predation in the U.S., especially with the burden of proof lying with the plaintiff: no plaintiff has won a predation case since 1993.⁵⁵ U.S. courts have not accepted any of the reputation models as a legitimate means of recouping losses.

⁵² See M Denger and J Herfort, "Predatory Pricing Claims After Brooke Group", *Antitrust Law Journal*, v62, 1994, p541 for a discussion of the various standards applied by the various Federal circuit courts.

⁵³ See *Brooke Group Ltd v Brown & Williamson Tobacco Corp* 113 S Ct p2578 (1993) p2587

⁵⁴ See *Brooke Group Ltd v Brown & Williamson Tobacco Corp* 113 S Ct p2578 (1993) p2581, 2587 and 2588

⁵⁵ Bolton, Patrick; Brodley, Joseph F. and Riordan, Michael H., "Predatory Pricing: Strategic Theory and Legal Policy", *Tilburg CentER for Economic Research Discussion Paper: 9982*, September 1999, p29

4.2 *Collection of existing legal rules for predation*

From the analysis of the existing framework of antitrust law and the economic research until now, we see that the legal rules to identify predation play a very important role in the application of economic theory to judicial practices. The discussion has shifted from the early price-cost comparisons to a broader strategic analysis, such as the intent of predation, the possibility of recoupment of the loss and some long run strategic issues. Here I want to briefly review those legal rules and give a general idea of the development of the predation tests.

** No rule*

According to the Chicago Scholars, there is no need to set a particular rule to judge predation because predation itself is irrational and hence rare in reality. Because of this, some competitive pricing practice may be mistakenly deemed to be predation and hence prohibited.

** “Per Se” rules*

1) Short-run cost based rule: The influential Areeda and Turner (1975) rule⁵⁶ sets out a condition for predation which is that the price should be lower than the short-run marginal cost of the firm and they use average variable cost as a more practical proxy.

⁵⁶ See Areeda and Turner, “Predatory pricing and related practices under section 2 of the Sherman Act”, Harvard Law Review, 1975, v 88, p697, Besides, they modified the rule several times after 1975 in 1978, 1982 and 1986

2) Long-run cost based rule: While the Areeda and Turner test is based only on the short-run marginal costs, Posner (1976)⁵⁷ added the long-term cost into the law against predation. He defined predation as pricing below the long-run marginal cost intended to eliminate a rival.

3) Output expansion rule: Williamson (1977)⁵⁸ has proposed a complex rule which governs the pricing and the output of firms. He suggested a rule about output that would prevent a dominant firm from increasing its output by over 10% for a period of 18 months following entry and a basic pricing rule that prices should cover long run average cost.⁵⁹

4) Rules governing price rises: Baumol (1979)⁶⁰ proposed another strategic predation control rule which is similar to that of Williamson, but Baumol's rule focuses on the price control, unlike Williamson's focus on controlling output. The rule requires that any price cut made by the incumbent in response to entry must be maintained for five years.⁶¹

5) Rule of reason test: Scherer (1976)⁶² put forward a test based on the rule of reason approach. It involves a thorough examination of the factual circumstances with

⁵⁷ See Richard A. Posner, "Antitrust Law: An Economic Perspective", University of Chicago Press, 1976, at p188-189

⁵⁸ See Oliver E. Williamson, "Predatory Pricing: A Strategic and Welfare Analysis", Yale Law Journal, 1977, v87, p284

⁵⁹ See Oliver E. Williamson, "Predatory Pricing: A Strategic and Welfare Analysis", Yale Law Journal, 1977, v87, at p297-302, 333-334

⁶⁰ See W. J. Baumol, "Quasi-Permanence of Price Reductions: A Policy for the Prevention of Predatory Pricing", Yale Law Journal, 1979, v89, p1

⁶¹ See W. J. Baumol, "Quasi-Permanence of Price Reductions: A Policy for the Prevention of Predatory Pricing", Yale Law Journal, 1979, v89, p4-8

⁶² See F. M. Scherer, "Predatory Pricing and the Sherman Act: A Comment", Harvard Law Review, 1976, v89, p868

particular emphasis on intent, and on the structural consequences of the alleged predation.

6) Two-stage test: Joskow and Klevorick (1979)⁶³ bring forward a so called “two-stage test” which is in fact adopted by many countries such as Canada. This rule is based on the theory that market power is a prerequisite for predation to be profitable. So the logical approach here is to require establishment of market power as a precondition to examining costs.

** Other tests*

There are no simple tests that can satisfactorily distinguish predation from competitive price cutting; the Court seems to agree with this. Besides the ones we discussed above, the Court uses different standards in different cases, such as feasibility of recoupment, the subjective intent of the related company, and any other relevant conduct.

4.3 Inspiration for the legislation of China’s price antitrust policy

From the research on the existing legal system about predation, we now have a general idea that the target of economists and competition law is to develop some theory or standards to distinguish and restrict it. Despite the common target, however, they have followed different paths. Economists feel free to adopt the newest theories (like game

⁶³ See Paul L. Joskow and Alvin K. Klevorick, “A framework for analyzing predatory pricing policy”, *Yale Law Journal*, v89(2), Dec 1979, p213

theory) in predation research while policy makers are always a few steps behinds. The courts are very prudent in the development of their rules and standards. Even though many tests have been proposed by economists and courts, none of the rules is perfect and embraced by everybody. We should realize that there is no possibility and also no need for such a consensus. Each case has its special conditions and background and calls for detailed case-by-case analysis instead of one simplistic panacea rule. Until very recently, the dominant tests were still price-based tests, although U.S. courts also consider the possibility of recoupment as well, which is analyzed using traditional market power analysis.

The objective and the most difficult task of the price antitrust policy is to develop tests which can distinguish predatory from competitive pricing. Those tests should be based on the circumstance where one believes that predation is really harmful for society and rational for the predator. As we have noted, the tests to determine predatory pricing belong to two basic models. One is the so-called cost model, based on the Areeda-Turner test; the other is the non-cost model. My view is that we should adopt the second model during the price antitrust legislation process. There is no direct and inseparable relationship between cost and predation behavior. It is not appropriate to adopt a single rule to judge all antitrust cases. Let alone that China's market economy is far from perfect, and cannot provide accurate cost information. So to identify a predation behavior, we should take into consideration many factors: 1) the tradeoff between present and future

profits; 2) whether the price has signaling effects and reputation effects; 3) whether there is a free entry, reentry and exit, and the possibility that the predatory price is above cost.

Besides, there are some other problems we need to pay attention to during the juridical analysis of predatory pricing in China. 1) Distinguishing predation from other unlawful pricing practices, such as price fraud; 2) Differentiating between the concept of “dumps”⁶⁴ in the international market according to the WTO and the predation behaviors in the domestic market; 3) Choosing compound rules to identify predatory behavior: price is not necessarily lower than cost, and predation may span several periods and several locations, which make the recognition of predation more difficult; and 4) Realizing the relations between present predatory pricing and future monopoly pricing and assessing the possibility of recoupment.

5. Predatory pricing in China and suggestions on related policy

5.1 Current status of predation in China

Unfortunately, price wars extend to almost every industry in China. In 2003, more and more companies in many industries adopted a below-cost pricing strategy to compete in the domestic markets for products such as TV, telecommunications, air conditioners,

⁶⁴ In the context of international trade, “dumping” occurs when a foreign manufacturer sells a product in the international markets at a lower price than is charged in the home market. Such price differentials can be easily explained by competition: new entrants in a foreign market may want to offer low prices to induce consumers to try their products.

automobiles and computers.⁶⁵ Why are so many firms carrying out this strategy no matter what the cost is?

China is in a transition process from a traditional planned economy to a modern market economy; its market system is neither mature nor perfect. Under these circumstances, price competition is an effective method and necessary phase of industry development. But predation will have negative effects on China's economy.

Predation is a very risky strategy. The direct results of it are reduced profits, a deteriorated competitive environment and no final winner. Take the TV industry in China as an example. During the past five years, the whole industry swallowed down more than RMB 5 billions (around 800 millions of Canadian dollars) in losses caused by the price war. And the interim financial report of 2003 of the dominant TV producer Changhong, which is a predator and leader of the series of price war, displayed a loss in the major operation of TV. The predation strategy takes away from firms the ability to perform research and technical development. The TV producers in China cannot afford the R&D expenses because of the less than 8% gross profit rate caused by the price war.⁶⁶ This does not facilitate China's enterprises participation in international competition; neither does the predation strategy benefit consumers. The producer's adoption of the predation strategy is based on the expectation that they will enjoy a larger market share and higher

⁶⁵ Bao, Gongmin. "Strategic Rethinking about Price War", *Economic Management (China)*, Aug. 2003, p3

⁶⁶ Bao, Gongmin. "Strategic Rethinking about Price War", *Economic Management (China)*, Aug. 2003, p6-9

profits in the future. So consumer may enjoy low price today, but they will face monopoly pricing tomorrow.

The problem has drawn the attention of many economists and policy makers in China. Now the government is trying to make the 'antitrust price statute' to regulate this behavior. In the following section, I make some suggestions regarding antitrust price policy making based on the existing experiences of developed countries.

5.2 Essential elements to a workable predatory pricing approach in antitrust price law in China

A workable approach to identify predatory pricing should take into account the need for legal accuracy, in addition to leaving enough room for an evaluation of all the facts involved in each individual case. It is not possible to construct such a framework in China in a short time; even in the U.S., the framework is not perfect and needs to be improved. But we can mention some essential elements which are necessary for a successful and more useful approach for regulating predation in competition law.

As we discussed before, a mere mechanical comparison between price and cost is not sufficient. Instead, what is needed is a comprehensive assessment of all the factors related to the alleged behavior, including the price, cost, the subjective intent, possibility of recoupment, and other related conducts which will help to identify the predation behavior.

The determination of the appropriate measure of costs has been a problem ever since the Areeda and Turner test was put forward in 1975 because of the complexity of business decisions, the subtle nature of firms' behaviors and the inferences involved. We should try to avoid every possible error when choosing a cost base. To simply define prices below AVC as predatory is problematic. For example, in a competitive market, price promotion or price cutting due to excess or obsolete inventories are quite usual and reasonable for producers.⁶⁷ Or, if we consider the learning curve hypothesis, firms will compete to move down the curve faster than their rivals, and in terms of pricing this can lead firms to charge a price which is lower than current marginal cost, without any predatory intent.⁶⁸ Those behaviors, although non-profitable in the short run, are legitimate commercial actions which need to be distinguished from predatory pricing. Also, this situation is normal in the high tech industry, where variable cost tends towards zero due to the low multiplication costs of intellectual products. Therefore, it has been suggested to use incremental costs as a benchmark.⁶⁹

Nonetheless, it is very difficult to apply this rule because of the extreme difficulty and ambiguity of both identifying the appropriate measure of cost and calculating the cost itself. Especially in the new economy, the quickly changing technology and industry

⁶⁷ Edwards, Geoff. "The Perennial Problem of Predatory Pricing", *Australian Business Law Review*, v30, June 2002, p183, p185

⁶⁸ Concluded from: Cabral, Luis M. B. and Riordan, Michael h. "The learning Curve, Market Dominance, and Predatory Pricing", *Econometrica*, v62(5), Sep.1994, p1115-1140

⁶⁹ Pitofsky, Robert. "Antitrust Analysis in High-Tech Industries: A 19th Century Discipline Addresses 21st Century Problems", *American Bar Association Issues in High-Tech Industries Workshop*, Feb.25-26, 1999, Scottsdale, Arizona, p4

structure make the relevant price/cost analyses more onerous and questionable. To accurately analyze the price/cost needs lengthy research of the relevant industry pricing and cost system. My view is that in these circumstances, today's two-stage test is a step in the right direction. It uses some tests other than price/cost test to screen the challenged probable predation behaviors first, and only those cases which pass the first stage test deserve the time consuming and costly price/cost test. The first stage test adopted in the U.S. today only pays attention to the probability of recoupment. However, this is incomplete and more aspects should be taken into consideration. We need to consider not only the probability of recoupment but also other aspects such as the market structure, subjective intent and all the relevant conducts to make the decision. We can distinguish predation behaviors in a cost-effective way by avoiding tedious price/cost analysis in every single case.

To conclude, the combination of a price/cost test with a first stage screening process is a workable approach for the near future. In the first stage, we should not only look at a single aspect like is done in the U.S. to avoid a simplistic conclusion. At the same time, we should bear in mind that competition law is based on economic theory and that it will keep changing with the development of research on the predation economic theory.

6. Conclusions

The aim of this paper was to consider some economic and legal aspects of predatory pricing to try to explain and regulate predatory pricing in China.

Predatory pricing itself is a hot subject which has drawn the attention of economists and policy makers for a long time. On the one hand, history and economic theory suggest that predatory pricing might be an instrument of abuse, but on the other hand, low prices are the hallmark of competition. Despite the energy devoted to the subject by many researchers from both the economic and legal professions and their attempts to develop a persuasive theory and proper rule for predation, no definitive economic theory and legal framework exists. China, as a big developing country with a strong economy right now, is facing severe predation problems.

There is no universally accepted definition of predation. However, predation does relate to a problem that is real and significant--- a means to permit full and fair competition by firms without foreclosure of entry. I defined predation as using an unreasonably low price to destroy rivals and recouping the loss by raising price later, which will cause a decrease of social welfare. These practices will harm not only the consumers and rivals but also the competitive process.

Despite this intuitive and simple definition, no unanimously accepted theory of predation has emerged yet. In the paper, I briefly reviewed the development history of predation which began with the publication of McGee's (1958) famous paper which

emphasized the irrationality of predation. After that, it is the Chicago School's irrational theory that dominated the research on predation for a while. Only in the last ten to twenty years did a major change take place in economic thinking on predatory pricing. The strategic basis and logic feasibility have undergone rigorous rethinking arising from developments of game theory and a deeper understanding of the role of imperfect information. The paper summarized the main theories in the development of the economic theory of predation.

Engaged in a process of transformation from a planned economy to a modern market economy, China is facing a severe and ubiquitous predation problem now. I tried to give predatory pricing an explanation using classical economic theory and modern organization theory. Among the four general types of industry markets, predation is most likely to be found in oligopolistic market, because of the existence of the conjectural interdependence, every producer realizes its influence on the small number of rivals. There are no definitive outcomes in this market and each participant will choose its strategy based on its understanding of rivals and assumptions about the markets. When the objective departs from profit maximization due to reasons such as the separation of ownership and control, predation is more likely to arise. According to modern agency theory, management may adopt the predation strategy even when it is not in the best interest of the stockholders.

Fortunately, there exists regulating mechanisms of the market economy to restrain

predatory behavior. This can be realized by the interaction of mature product, capital and human resource markets. But we cannot totally count on these restriction mechanisms to fight against predation; another effective means is to recur to the antitrust law.

China has not had a perfect market economy and mature law system. The law system still lags many of the requirements of the market economy and the globalization of the world economy. The paper tried to make some suggestions about how to construct an effective and practical antitrust price law by learning from the experiences of developed countries such as the U.S.

A major difficulty for antitrust law is distinguishing predatory pricing from competitive price cuts. In view of this, the U.S. courts favor cost-based tests for identifying predatory price cuts. But the price/cost test is difficult to carry out due to its measuring and calculating costs. Moreover, one of the strongest implications to emerge from the recent models is that successful predation does not necessarily require prices to fail the Areeda & Turner test or any other cost-based test. It is clear that a purely cost-based approach is not enough and cannot recognize the complexity of the predation strategy, so a two-stage test seems more workable. Before going to the price/cost test, we should use some combination criteria to screen the challenging cases which make the legal system more efficient. As to the criteria, we should consider the related factors such as intent, the possibility of recoupment and other related matters discussed in the paper.

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