

GAME RESEARCH ON STRATEGIC INVESTMENT MANAGEMENT IN PROVINCE

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Abstract: In order to make an in-depth analysis to mutual relations and multi-interest of the strategic investment management model in province, it utilizes the game theory, and researches the basic elements in the game model, which it establishes, including the assumptions, strategies, objectives and functions of the two players. Finally, it quotes the imperfect information static game model, and takes the first level sealed price auction game model as the quintessence to describe and analyze the game behavior in the strategic investment management in province, so that it can provide the opinion and suggestion for all the gambling players' decision-making, meet with the economical globalization and the dog-eat-dog new situation, grasp the strategic opportunity, strengthen the management from the strategic perspective unceasingly, and upgrade the provincial economic development strength.

Key words: Province, Strategic Investment Management, Game Theory

1. INTRODUCTION

In recent years in our nation, with the continuous mercerization evolvement of investing and financing system and with the gradual completion of state-owned capital operating mechanism, as the key link of the graded management system in national investment, the provincial government have greatly changed the role in the investment management, for the proportion in direct investment reducing gradually and it is necessary to show the strategic influence of provincial government in the process of investment management.

The provincial strategic investment management is a dynamic process with the strategy and target being drawn up based on the change of inside and outside environment in provincial area, being taken charge of the whole process of execution and guaranteed the correct commitment of the purpose in order to promote provincial economic development. It is also can be seen as the provincial government carrying out a long-term 、 global organizing and planning activity towards investment behavior in the scope of jurisdiction, aiming at increasing regional investment benefits and promoting regional economic development. The provincial strategic investment management should embody the government's guides and impetus. On one side, the government should choose pillar industry according to local and humane environment. In the resource industry, the government should choose the top of

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industrial chain, namely the resource exploitation; for the other industries, the government should choose the end of industrial chain, which is the manufacture of finished products. In this way, the government can lead a better way in the investment of social capital. On the other side, after choosing relevant pillar industry, government needs to coordinate beneficiary relationship between government and investors, find out the equilibrium point on the interests for both sides and reduce direct investment, expecting more and investment from social capital, making the effect of leveraging a small investment into a large profit.

The realization of provincial strategic investment management will create a new way of more effective resource allocation, which will take great advantage of economic resources in province, improve innovation ability of provincial strategic investment behavior, in addition to enhance industry upgrade and economical competitive advantage, thus gain the promotion of great-leap-forward development of provincial economic.

This paper emphasizes on analyzing the impetus role of provincial government in provincial strategic investment management, which is the game research in coordinating relationship and benefits between government and investor, so as to establish the game model for provincial strategic investment management, including assumptions, strategies, objectives of the two players as well as detailed analytical statement of equilibrium point on the interests of both sides under different circumstance. By doing so, the provincial government can be guided in a more effective way in choosing under the process of strategic investment, in order to guide and push social capital invest, facilitate reasonable provincial resources configuration and economical development.

2. ASSUMPTION OF GAME PLAYERS

In the economics analysis, no matter choosing which game structure for making the elementary description of practical economic activities, the first thing is the confirmation of game players.³ This paper will set game players through illustrating the behavior of both provincial government and investor, analyze game relationship afterwards.

2.1 Assumptions of the government

The provincial government's work is pursuing the optimal solution of the effectiveness under specified constraint condition of behavioral environment. This paper proposes following assumptions according to public choice theory, standing in the shoes of provincial government's behavioral environment:

- 1st. The assumption of economic man⁴;
- 2nd. The assumption of limited rationality;
- 3rd. The assumption of behavior consistency⁵;
- 4th. The independence.

2.2 Assumptions of the investor

2.2.1 The investor is completely rational

Among all the investors, the private investor and normal investor have explicit target that is to pursue

³ Xie Shiyu. (2003). *Economic Game Theory*. Fudan Press, 10-15

⁴ Kirlin, John J. (2003). Regional Investment as a Theme in Public Works Policy Making and Management. *Public Works Management & Policy*, 8 (1):28-32

⁵ Huang Tao. *Game Theory* (2002). Beijing: Renmin Press, 23-27

maximum profits, which is the essence of capital, in accordance with the characteristics of traditional capital output⁶.

2.2.2 The Investor has expectations

The investor will form the expectations directly towards current economic situation and government policy determinations according to their own experiences.

2.2.3 Information

The choice of the investor's tactics and the responses towards government policy is different based on whether having complete information or not.

3. GAME PLAN ASSUMPTIONS OF BOTH GAME PLAYERS

3.1 Construction of government competitive advantages and game plan

There are four issues the provincial governments must be clear if they want to have discrepancy competitive advantages in the introduction of capital competitions⁷: First, under current circumstances, what competitive advantages does the province has when fighting against other provinces in attracting foreign investment? Second, what are the resources of the competitive advantages? Third, how long can this competitive advantages maintain? Fourth, how can the competitive advantage are built? At present, each province is attracting investment by its own advantages of power sources · geographical positions · humane environment, etc. Under such fierce competition, above-mentioned issues need to be thorough analyzed and carried out before the introduction of investment. Only when these basic issues being sorted out, can the government control the competitive advantages, then obtain the investment.

Under the game theory of using the investment, provincial government has optional tactics congregation, which is the way or method that can be chosen while making decisions. Within the central government's authority scope, the factors of the influence to investor's zone choice by provincial government, according to Ning Deng's eclectic theory, can be divided into the natural endowment advantage and the investing environment advantage⁸. The natural endowment advantage, eg. local economic level of development · infrastructure condition · public institution serving quality · market scale and so on, belong to the local constraint conditions of resources endowment characteristics, which require relative long-term process of improvement, and cannot be treated as game plan. The latter means soft artificial environment which is primarily includes provincial government's autonomous investment policy, etc.

The choice of government tactics possesses not only autonomy but also biggish volatility and uncertainty. When the government determines to participate in the game of attracting foreign capital, the government's function let iron the economic fluctuant manipulate against economic running, so the government will take certain measurements within reasonable scope when he figured out that it need outside driving force to promote and coordinate the economic development, which means the government will use its own competitive advantages to fight reasonably against other governments to attract the incoming of foreign capital, thereby to boost local economic development. While once the government feels that current local economics is under smooth condition, and the abrupt pouring of foreign capital may be doing harm to relative local economic development, or the local competitive advantages are not outstanding, the government will give up the compete, even will refuse the foreign

⁶ Jeffrey C Strieter, Sandeep Singh. The determinants of acquisition of outside investment management service providers in public and corporate pension plans and endowments (2005). *International Journal of Bank Marketing*, 23 (3)

⁷ Armstrong H, Taylor J. *Regional Economics and Policy* (1985). Oxford: Philip Allan.

⁸ Gordon L Clark. The functional and spatial structure of the investment management industry (2000). *Geoforum*, 31 (1):71-86

capital, such as increasing tax rate \ raising land remising fee. Meanwhile, the government will make a full range of comparison among all the industries in its own scope of jurisdiction to choose pillar industries which can greatly support local development of economics and other aspects and the government will put forward more favorable strength to attract foreign capital for the pillar industries. This can benefit both game players, and reduce risk in the investment activity as well.

In this paper, the discussing scope is limited in investment field, however the government has multivariate target as economics \ culture \ employment etc., and expect complete coordinating development in the province; while the investor's ultimate goal can be conclude to maximum profit, therefore differences exist between the maximization of both sides. Nevertheless both game players can only coordinate the relationship between favorable policies (government cost), which is made by government who wants to attract investment, and the benefits of the investor (investor's output) to realize the maximization. So the government is playing the game by constantly regulating the proportion of input and output.

3.2 Game plan of the investor

As the market competition become more and more fierce and the market development being multivariate and borderless, many investors start find new markets and manufacture fields with cost advantage⁹. After the investor determine whether to invest or not, the main consideration, while negotiating with the invested provincial government, is investment quality. Investment quality, which means the contribution degree made to local economics by executing the investment project. There are three primary measuring indexes: industrial structure optimization \ technical progress and foreign trade. By whether establish R&D center and regional headquarters (RHQ) or not, can determine the local area has low or high added value on the industrial chain.

The investment quality is a contractual arrangement for two stake-holders, the investor and provincial government and the investment quality determines the investor's position in the negotiating with provincial government and the preferential degree of the stimulant policy provincial government gives. This is a mutual game process that both parties involved, both parties' plan may be adjusted during the gaming , such as the investor's sincerity in technical transfer \ the establishment of the R&D institution and regional headquarters, undoubtedly, the stimulant policy provincial government issuing will change accordingly. Besides, whether the invested is pillar industry confirmed by provincial government also somehow determine the preferential degree of the given policy.

4. THE TARGET OF BOTH PLAYERS

4.1 The target of provincial government

Under the index exam mechanism, because of the multiple functions of the government in current economic society, the maximization target seems to have diversifying characteristic. However, viewing from some indexes in the exam mechanism, the primary sub-target is the economic increase aimed at maximum GDP or maximum growth rates.

However, according to the abroad experiences and developing practice in China, the increase of GDP is not equivalent to economic development; an integrated index system should be used to measure the level of economic development.

What needs to be further illustrated is that during the process of developing local economics, owing to the different stages of economic development, there are different predilections towards different

⁹ Von Neumann J., Morgenstern O. *The Game Theory and Economic Behavior* (1994). Princeton University Press, 8-10.

subjects in the total target system. GDP and some hard economic indexes are more important in the early period, and later the key point become the coordinating development of economics and society, including employment、welfares for low income people and ecological environment protection、reasonable exploitation and utilization of resources¹⁰. The government's needs of foreign investment differ according to different resource endowment. The provincial government with lower level of economic development is much more restricted by capital deficiency. Thereby the target of using foreign capital make up the gap of capital deficiency is being paid great attention to. With high level economic development, the provincial government is trying to pursue the quality of economic increase, emphasized on introducing advanced foreign techniques, the purpose of introducing capital is to promote local technology and enhance competitive power.

The preferential policy supplied by provincial government to the investment activity is actually government costs and the more the allowance, the higher the costs. Therefore, provincial government will try to reduce the supply of the allowance, on premise of guaranteeing the development. Of course, the preferential policy supplied by provincial government is not only determined by natural endowment and economic development, but also in relation with the preferential policy supplied by competitive provincial government.

4.2 The target of the investor

The investment behavior can be seen as maximizing self benefits by finding out the optimum investment tactics under certain circumstance. But the target is diversify, which contains profit maximization and non-profit maximization, such as sales turnover maximization、long-term survive、satisfying profit、CEO's personal target、social responsibility、growth and extension¹¹.

With economic development, the investor's motivation presents to be multivariate, different types of investors have different specific motivation. However, no matter which kind of motivation, the purpose is the same, try to gain long-term integrated profits, essentially set the profit maximization as the final goal¹².

The essence of capital is to pursue profit maximization. In most economic models, normal assumption is that a CEO's primary target is to maximize shareholder value. If choose a single target to make detailed illustration to interpret characteristics of the investor's behavior, the choice have to be profit maximization. The plan made by the investor is dominantly lying on analysis towards investment revenue-cost to maximize profits; supposing that benefits maximum is the only motivation and target for the investor's behavior¹³.

What the investors pursue is the maximum level of preferential policy supplied by government; the preferential policy is actually additional profits to the investor, the more favorable the policy being supplied, the higher profits the investor will get. As a result, the investor will take various measures pressing on government in order to higher the degree of preferential policy from government, and then realize the target of profit maximization.

¹⁰ Calvello A. Investment management: 8 Steps to Improve Performance (2003). Healthcare Financial Management: Journal of the Healthcare Financial Management Association, 57 (6): 44-50

¹¹ Zhang Weiyang. Game Theory and Information Economy (1996). Beijing: Sanlian Bookstore, 27-33

¹² Singhvi, S. Game Theory Technique in Investment Planning (1974). Long Range Planning, 7 (4): 59-61

¹³ Selten.R. Re-examination of the Perfectness Concept for Equilibrium Points in Extensive Games (1975). International Journal of Game, 4: 25-55

5. GAME RESEARCHES ON PROVINCIAL GOVERNMENT AND THE INVESTOR

5.1 Assumption of game function

This paper simplifies the relationship between both game players as negotiating issue only between one provincial government and individual investor.

Suppose a_M as a sign of minimum favorable level supplied by government. If investor does not accept the government lowest supplying favorable level, there will have negotiation between provincial government and investor to obtain a higher level of investment preferential, under such condition, the preferential which the investor is hoping can be shown as a_N . Assume known probability $p(0 \leq p \leq 1)$, this can reflect uncertainty of preferential condition supplied by provincial government, namely the preferential condition is floating between the minimum a_M and the maximum a_N .

Suppose in the provincial strategic investment, social profit is $B(a_i)$, including government profit $G(a_i)$ and investor profit $E(a_i)$. Here $B'(a_i) \geq 0, B''(a_i) < 0, G'(a_i) \geq 0, G''(a_i) < 0, E'(a_i) \geq 0, E''(a_i) < 0$. Assume that to any given level of investment preferential, when come to terms, both sides' total cost and marginal cost are all lower than the circumstance when protocol failed (according to Coase theorem)¹⁴.

In the model of game theory, using $CP(a_i)$ to present project cost produced by investor in the plan i , using $CE(a_i)$ to present negotiation cost made by investor in plan i , using $CG(a_i)$ as a sign of negotiation cost made by government also in plan i , using $CD(a_i)$ as a sign of preferential policy cost produced by provincial government still in plan i . Suppose the cost advantage, which is reached under negotiation, means exist following conditions to all a : $CP(a_M) > CP(a_N)$, $CE(a_M) < CE(a_N)$, and $CD(a_M) + CG(a_M) < CD(a_N) + CG(a_N)$, profit is $E(a_M) < E(a_N), G(a_M) > G(a_N)$. The trends of various cost functions are shown in Figure2, suppose $CD(a_i)$ and $CP(a_i)$ change in the linear way besides negotiation cost.

The negotiation of both $CG(a_i)$ and $CE(a_i)$ are all increasing with the increment of a_i , that means with the carry out of preferential policy negotiation between government and investor, the negotiation will become more and more arduous, the cost will become heavier, the amplitude will definitely raise unceasingly. The preferential policy cost of $CD(a_i)$ will increase with the increment of a_i , in other words, if the government supplies better preferential policy to investor, as reduction or exemption of tax · reduction of land grant fee and so on to cause higher cost. Investor's project cost $CP(a_i)$ will reduce with the increment of a_i . Make curves fit of both costs, you can get cost curves of government and investor separately, shown in Figure 2. When both curves reach an intersection, the preferential policy produced is the equilibrium point a_N^* . a_N^* and a_M , which means preferential policy the government can supply, as well as a_N , the hoping preferential policy of investor, the three variables' position can determine whether the negotiation between government and investor will succeed or not, of course the government prefers a_N^* approach a_M closely, while investor is hoping the a_N^* approaches more closely to a_N . The exact position of a_i will be discussed in the following context.

¹⁴ Ronald H. Coase. The Problem of Social Coast (1960). Journal of Law and Economics, 3(1): 1-5

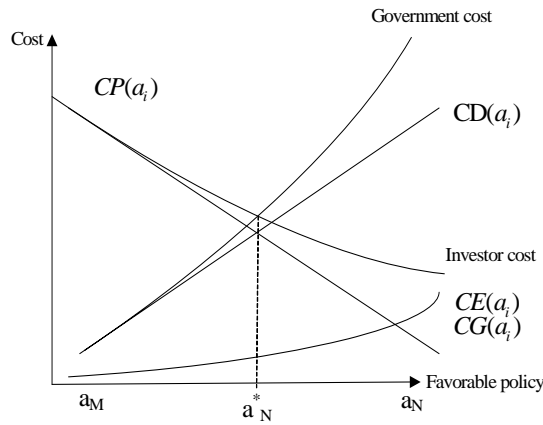


Fig.1 The trends of cost change with a_i

According to Figure 1, the negotiation of both the government $CG(a_i)$ and investor $CE(a_i)$ are all increasing with the increment of a_i , that means with the carry out of preferential policy negotiation between government and investor, the negotiation will become more and more arduous, the cost will become heavier, the amplitude will definitely raises unceasingly. The preferential policy cost of the government $CD(a_i)$ will increase along with the increment of a_i , in other words, if the government supplies better preferential policy to investor, as reduction or exemption of tax, reduction of land grant fee and so on to cause higher cost. Investor's project cost $CP(a_i)$ will reduce with the increment of a_i . Make curves fit of both costs, you can get cost curves of government and investor separately, shown in Figure 1. When both curves reach an intersection, the preferential policy produced is the equilibrium point a_N^* . a_N^* and a_M , which means preferential policy the government can supply, as well as a_N , the hoping preferential policy of investor, the three variables' position can determine whether the negotiation between government and investor will succeed or not, of course the government prefers a_N^* approach a_M closely, while investor is hoping the a_N^* approaches more closely to a_N . The exact position of a_i will be discussed in the following context.

Suppose the net earnings of government, which under the circumstance of supplying lowest preferential level, is presented by $NSG(a_M)$, while the net earnings of investor is presented as $NSE(a_M)$, they can be signified separately as

$NSG(a_M) = G(a_M) - CD(a_M) - CG(a_M)$, $NSE(a_M) = E(a_M) - CP(a_M) - CE(a_M)$. Likewise, if the investor does not accept the lowest investment favorable level and then resorts to negotiation, the government will supply higher level of favorable in order not to lose investor, suppose this time, the preferential policy level is a' , a' can make the social net earnings, which described as $NSB(a') = NSE(a') + NSG(a')$, to reach maximum. If a' is replaced by a_N^* , to indicate the optimal solution, the first-order condition can be met:

$$G'(a_N^*) + E'(a_N^*) - CD'(a_N^*) - CG'(a_N^*) - CP'(a_N^*) - CE'(a_N^*) = 0 \quad (1)$$

Under such situation, in which the target assumption is given, a_N^* is the investment preferential level that can make the social net earnings maximum, the society will get net payback equals to $NSB(a_N^*)$, owing to the probability of successful negotiation, which is between provincial government and investor pointing against investment favorable level, is p , for the social expectation to net payback is $pNSB(a_N^*)$,

a_N^* as well can maximize this expression.

If the provincial government and investor can reach an agreement on minimum investment favorable level, investor's cost is $CP(a_M) + CE(a_M)$. On the contrary, if there is no agreement on this matter, the government and investor will continue to negotiate for a higher preferential level. In general particular, investor's expecting cost is $p[CP(a_N^*) + CE(a_N^*)]$. Pay attention to this assumption that investor will choose this provincial government to be his cooperative partner.

In the Figure 2, the decision tree summarizes the event results, by $B(a_i)$, the social benefits, as the standard, node means decision maker (G=government, E=investor) as well as profits circumstance of both provincial government and investor under possible condition. The decision tree indicates these two basic policies:

- (1) Government decides whether to supply minimum investment favorable level a_M or not;
- (2) Investor determines whether to accept such level or not.

If the government proposed a investment favorable level, $a_i = a_M$, investor will not accept such preferential level if and only if under such circumstance, investor's expecting cost is lower (or at least not higher) than the cost which is under the circumstance of highest investment favorable level, that means if and only if:

$$CP(a_M) + CE(a_M) \leq p[CP(a_N^*) + CE(a_N^*)] \quad (2)$$

Or, with the premise of assuming investor's project cost function $CP(a_i)$ and negotiation cost function $CE(a_i)$ have same linear relationship, the following expression can be transformed:

$$C_M a_M \leq p C_N a_N^* \quad (3)$$

Under the circumstance of given p as well as cost parameter, expression (3) determines the maximum a_M^{\max} , which is the minimum investment favorable level a_M that investor is willing to accept, it can be presented by

$$a_M^{\max} = p \frac{C_N}{C_M} a_N^* \quad (4)$$

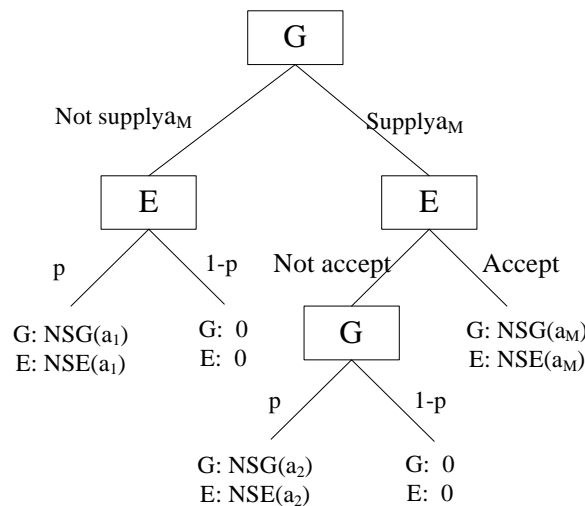


Fig. 2 The decision tree of regulator and firm

a_M^{\max} is increased along with the increase of p . The probability that investors accept lowest investment favorable level will be change because of the change of p . The probability of $a_M^{\max} > a_N^*$ couldn't be exclude because costs of investors are not definite along with the changing of a_i , $CP(a_i)$ is reduced along with the increase of a_i which means investment preferential, but $CE(a_i)$ is increased along with the increase of a_i .

$G(a_i)$, which means governmental profit is reduced along with the increase of a_i , $E(a_i)$ which means profit of investors is increased along with the increase of a_i , so magnitude of $B(a_i)$ which means social profit is not definite along with the change of a_i . When social profit in the lowest investment preferential condition is not less than it in the condition of prospective highest investment favorable, both parties involved are possible to accept lowest investment preferential level.

$$NSB(a_M) \geq pNSB(a_N^*) \quad (5)$$

This condition implies interval (a_M^{\min}, a_M^0) of a_M , government tends to lowest investment preferential level in this interval, in which it may be considered $a_M^{\min} = a_M$, namely government can supply the minimum value of the favorable policy. Figure 3 show the interval, in which a_M^{\min} means the low limit of the interval, namely government supplies the minimum value of investment preferential level, a_M^0 means upper limit of the interval, which is the investment preferential minimum value that provincial government provides. Furthermore, a_M^* is also in this interval, in which a_M^* is the optimum level for a_M , namely the level makes $NSB(a_M)$ biggest. Therefore, single-order condition is solved

$$B'(a) - CD(a_M^*) - CG^*(a_M^*) - CP(a_M^*) - CE^*(a_M^*) = 0 \quad (6)$$

When the negotiation between government and investor succeeds, a_N^* should be in this interval, and

$$a_N^* > a_M^*, \text{ then } a_M^0 > a_N^* > a_M^* > a_M^{\min} \quad (7)$$

5.2 The balanced result of Game theory

As Figure 3 shows the behavioral description of provincial government and investor which is in front indicates necessary and sufficient condition in which investment favorable level makes balance in optimum behavior condition

$$a_M^{\max} \leq a_M^0 \quad (8)$$

Namely highest value of the investment favorable policy that provincial government provides is not less than the highest value of a_M which investors will accept. When it lacks the menace of losing the chance of investing, lowest investment preferential level can not be the balanced result. Therefore, what makes investment preferential level possible is just about the menace of losing the chance of investing.

It also indicates that the menace of losing the chance of investing is sufficient condition of the balanced result. Specially, $a_M^{\max} \leq a_M^0$ namely the follow points can be made to any $p > 0$ with (8): the balanced result of Game theory is lowest investment preferential level that government supplies and investors can accept.

The point indicates possible cost saving brings the potential which makes both sides advantaged, namely achieves "win-win". If both sides adopt optimum behavior, the potential will be found in the balance.

This perspective makes sure the existence of a_M that both sides can accept, namely scope of reciprocal agreement. However, does not fix balanced level of a_M , this all up to the result of negotiation

which is between provincial government and investor. Nevertheless, according to following context, both sides' bargain ability effect not only voluntary agreement on profits distribution, but also effectiveness of investment preferential level. As a result, this paper takes consideration about bargain ability for three situations: Provincial government possesses absolute bargain ability; Investor possesses absolute bargain ability; both sides share the profits.

When the provincial government possesses complete bargain ability, it can supply the choice "Accept or not" for investor, so as to make profits to reach the maximum under constraint of expression (8). Under this assumption, relatives to the following two situations, there are two equilibriums which are possible:

$$a_M^{\min} < a_M^* < a_M^{\max} \quad (9)$$

$$a_M^{\min} < a_M^{\max} < a_M^* \quad (10)$$

The equilibrium (9). In this situation, any value of a_M as long as satisfied $a_M^{\min} < a_M < a_M^{\max}$, for both sides are all willing to choose minimum favorable level. Thereby, a_M^* can meet this condition along with maximum of $NSB(a_M)$, provincial government will supply a_M^* (investor will accept). Above all, the consequence of equilibrium is a proposal with minimum investment preferential level.

The equilibrium (10). Because a_M^* does not belong to the interval between a_M^{\min} and a_M^{\max} , if the provincial government supply a_M^* , investor will refuse and reach the result of back maximum investment favorable level. Therefore, it is better for provincial government to supply the level a_M^{\max} to produce a higher investment level. Take notice of what is necessary for attracting investor to accept, which is nothing but higher level of investment preferential. Yet, due to the possible that a_M^{\max} may be bigger or smaller than a_N^* , it is high or low is primarily up to the value of p . Let us summarize all the above with following perspectives.

(1) If the government possesses absolute bargain ability, this time the result of equilibrium may be a proposal with optimal investment favorable level, although might not guarantee optimal level.

(2) If the equilibrium result is optimal one, the social net earnings, which is under such minimum investment favorable level, is beyond the level of maximum investment favorable, which means "beyond abide by".

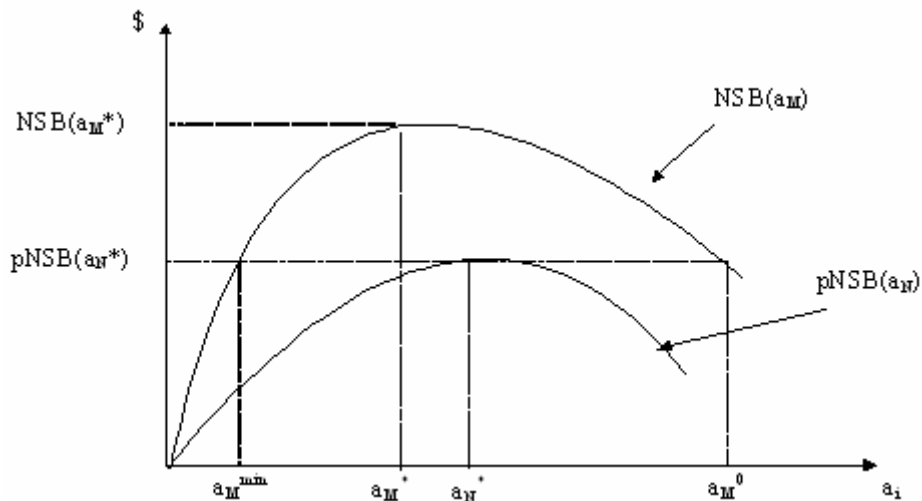


Fig. 3 The scale of a_M by regulator

When the investor possesses absolute bargain ability, investor will supply proposal to gain complete profits (Actually, investor enforce government to decide whether to accept or not). Apparently, the consequence of bargain is a_M^{\max} , connected with $a_M^{\max} > a_N^* > a_M^*$ can reach following perspectives:

If investor possesses absolute bargain ability, there will not be optimal result from equilibrium point. Furthermore, the equilibrium result is like this, investment favorable level is higher than optimal investment preferential level under such circumstance, also higher than maximum investment favorable level. We can see clearly from all above, while both sides want to share their profits (such as under Nash equilibrium), in the first equilibrium, the level will between a_M^{\min} and a_M^* . In the second equilibrium, the level will between a_M^{\min} and a_M^{\max} .

6. CONCLUSION

This paper adopts the method of game theory, emphasizes on model analysis, which is related to benefits coordination and relationship between government and investor in the investment management. Paper establishes game model of provincial strategic investment management, which including the assumptions, strategies, objectives as well as detailed analysis of profits functions of the two players, government and investor, and then make conclusion of game theory: take cost factor into consideration, the provincial government take advantage of investor's benefits marginally reduce along with the increment of investment dimension; under the circumstance of without considering other factors or equal factors, the more favorable stimulating policy government supply, the higher of the marginal benefits rate for investor, the bigger of the investment dimension, the higher level of benefits in game theory.

Being constrained by author's energy and objective condition, there are still following insufficient aspects in researches:

1st. In the process of establishing game model, it is mentioned that three relationship exist, namely game theory between provincial governments, game theory between investors as well as the last one between government and investor, this paper only pays great attention to the last situation and carries out deeply discussion, besides, simplifies this relationship into game theory's relationship just between only one government and one investor. In reality, the existence of other two relationships would affect the last relationship to a certain degree, need to be further discussed so as to reach a kind of perfect establishment of game model.

2nd. In the game model established by this paper, does not think over other ways of investment by government. Therefore, this question can be raised, in other words, whether the government would take measures of (or under certain circumstance) "carrot" and "big stick" manner, through subsidy to partial or global cost produced by investor to lure investor take participate in the minimum investment favorable level. This requires further refinement.