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Study on the foreign investment preferential policy formulated by host country

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The author makes use of the modern economic theories and methods to construct a theoretical framework for game analysis that centers on the creation and distribution of return on transnational corporations' investment; thereby interprets the formulation and implementation of host country's foreign investment policy and reinforces the existing theories and, on the other hand, analyzes the investment behavior of the transnational investors and the measures taken by the host country to attract foreign investment as well as the interaction between transnational investors and host countries; and thus creates a solid international investment theory. The author analyzed the static and dynamic games with complete information between transnational corporations and host country and found the optimal solutions under the highly abstract assumptions. He also found that, when other conditions remain unchanged, the optimal level of host country's foreign investment preferential policy is in direct proportion to its needs of foreign investment or the scale of capital gap, and is in inverse ratio to the level of its investment environment.

Key words: Transnational corporation, FDI,game theory.

INTRODUCTION

In the years prior to World War II, international production (including foreign direct investment) comprised a small share of transnational corporations(TNC). Since international trade constituted the largest component of transnational corporations; international economists essentially focused their attention on the explanation of trade among nation. The Ricardian and other versions of the comparative advantage doctrine, which assumed perfect international immobility of the factors of production (thus zero FDI), were utilized to explain trade among nations (Hosseini, 2005). After World War II, in particular after the 1960s, the character of transnational corporations began to change. It was during this phase of international economic history that the transnational corporation, foreign direct investment (FDI) and other forms of international production, began to emerge and gradually become significant (Hosseini, 2003).

The study on transnational corporations (TNCs) and foreign direct investment (FDI) can hardly be found in the classical international trading theories. As a result of the booming FDI due to the increasing number of transnational corporations in the last century, researchers started to modify the traditional theories in order to interpret the booming FDI. Researchers have formulated a number of FDI theories, such as the Enterprise Advantage Theory (Hymer, 1960; Kindleberger, 1969; Caves, 1982), Internalization Theory (Magee, 1977; Buckley and Casson, 1989；Rugman, 1981,1986,1996), Product Lifecycle Theory (Vernon, 1966, 1979; Wells Jr.,

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1968), Comparative Advantage theory (Kojima, 1973, 1978, 1990), International Production Eclectic Theory (Dunning,1971, 1977, 1981, 1988), as well as the Foreign Investment Theory (Lambkin, 1988; Lieberman and Montgomery, 1988, 1998; Robinson et al.,1992) that have become popular in the last 10 years focusing on domestic marketing and strategic management as well as the study on the decisive factors for the timing of transnational corporations' entrance into host countries (Buckley and Casson, 1981,1983,1989; Casson, 1987,1994; Rivoli and Salorio, 1996; Tan and Vertinsky, 1996; LUO, 1998; Martin et al., 1998; Pan et al., 1999; Tzu-min Lee, 1995; Ming-chou Hong, 1997; Li-chen Chou, 1997; Shou-chin Ho, 1998; Yu-shu Peng, 2000). However, these theories are founded on the behaviors of transnational investors, especially FDI, and the host countries are merely a factor in the theoretical analysis and premises, not included in the analytical structure at all.

In the regional theory and International Production Eclectic Theory, the regional factors of host country (such as labor costs, market situation and host country's policies) are included in the analytical structure and are considered a factor for the transnational investment. However, the host countries are merely a recipient of the transnational investment, and are not in a position to affect the options and decisions made by the trans-national corporations and, therefore, cannot change the transnational investors' behaviors (Hosseini, 1985). As far as these theories are concerned, the foremost concerns are the motives for the transnational corporations' investment in foreign countries and where to invest. In other words, these theories are based on the distribution of return on investment and, as a result, the creation of return on investment is considered the top priority. Therefore, these theories focus on the motives of trans-national corporations' FDI and capital flow, instead of the scale and quality of investment. However, the scale and quality of investment are considered the optimization factor for the transnational corporations. Its solutions have been found in the investment theory and are, therefore, not a problem for FDI theory at all. In this connection, the current FDI theory focuses on individual analysis and is a supply-decisive theory. Therefore, the theoretical structure is incomplete and falls short of interpretation capability.

As far as the host countries are concerned, the foremost concern is how much revenue they can obtain from the investment, as opposed to whether the transnational corporations can profit from their investment. In other words, the host countries are concerned of the amount and the nature of investment, instead of where the transnational corporations invest. Therefore, the host countries' concerns are somewhat different from the transnational corporations' concerns. First of all, the analysis is made under the premise of return on investment and, therefore, the foremost concern is the distribution of the return on investment and, as a result, the scale and quality of investment become the core factors of the study. Secondly, the study itself is not a microanalysis as stated earlier. Actually the study is a macro analysis of transnational corporations' investment in the host country based on the individual transnational corporations' investment. Therefore, the subject matter of the study includes all foreign investors in the host country (including the transnational investors and the potential transnational investors), as opposed to the individual investors. Thirdly, the scale and quality of investment are decided according to the host country's behaviors and are included in the study as well. The investment decision itself is made to maximize revenue for transnational investors and host country and is, therefore, the optimal solution for both transnational investors and host country in the game theory and is a new analysis method.

As indicated in the previous sections, some theories did not include the host countries as the object of decision and included the background of transnational corporations' investment decisions into the analysis structure based on their assumptions of the host countries' characteristics. Therefore, these theories were designed to describe the investors' behaviors but were insufficient to describe the behavior mechanism and characteristics and, therefore, fall short of the author's expectation. Understanding the drawbacks of the prior studies, the author studied the host countries as the core of his research and utilizes the contemporary economic theories to create a systematic framework concerning transnational corporations' investment in order to study the behaviors of the host countries fundamentally and set the direction and model for the related studies. The purposes of this study are summarized as follows:

1. To create a game theory analysis model based on the interest of host country in order to study the transnational corporations' investment under the guidance of the optimal foreign investment preferential policy designed by the host country.
2. If the policy is maintained at an optimal level, how do transnational corporations decide the scale and quality of their investment?
3. How does host country formulate its foreign investment preferential policy in order to maintain the scale and quality of transnational corporations' investment at the optimal level?

Theory

It was the desire to respond to such questions that motivated Stephen Hymer to devote his 1960 dissertation to the study of foreign direct investment, which required

to take on the neoclassical application of the portfolio flows theory to foreign direct investment after WWII. His study found several features of FDI (and TNC) inconsistent with the neoclassical portfolio flows theory. Among these were two features: that the transnational firms overwhelmingly finance their host-country operation in host-country capital markets, and secondly that there existed substantial concentrations of FDI and TNCs in certain countries (Hosseini, 2003, 2005).

Hymer's criticism of the neoclassical application of the portfolio flows theory was complemented by his attempt to search for a plausible theory of FDI. In this attempt, he found two factors motivating FDI. The first of these was that FDI was motivated by attempts to reduce or remove international competition among firms. A second motivation was the desire of TNCs to increase their returns from the utilization of their special advantages. He also indicated a minor motive—that of diversification, which does not necessarily lead to control (Hymer, 1976). Many, including Teece, view these as important insights, which: “laid the foundation for a completely new paradigm of international firm” (Teece, 1985). With this, Hymer transported the theory of foreign direct investment out of the neoclassical international theories of trade and finance and into industrial organization, the study of market imperfections. This became known as Hymer–Kindleberger paradigm (Hosseini, 2005).

For Hymer (who used industrial organization theory), the transnational corporation, FDI, came to existence because of market imperfections. He began his analysis by assuming that TNCs operate at a disadvantage with respect to host country firms, since there exists additional costs of doing business abroad. To him, in the face of these additional costs, for a TNC to be profitable, it must possess other advantages, in the form of superior technology, better products, or firm-level economies of scale (Norman, 2001).

Hymer died during the 1970s. However, the market failure approach he initiated was formalized and further developed, in the form of transaction cost, internalization and the eclectic paradigms. These, in particular, appeared in the works by Buckley and Casson (1976, 1985, etc.), Rugman (1981, 1985, 1996, etc.), and Dunning(1977, 1981, etc.). For these writers, Hymer's dissertation had failed to distinguish between two types of market imperfections- the structural type (ala Bain, 1956) and the transaction-cost type (ala Williamson, 1975). Structural imperfections would lead to deviation from perfect competition in the product market, and result from: “the control of ownership advantages of factors proprietary technology, privileged access to inputs, scale economies, control of distribution systems, and product differentiation” (Kalfadellis and Gray, 2002). The transaction cost type imperfections arise naturally and are assumed to be exogenous to the TNC. According to Casson (1987), Hymer's failure to distinguish clearly between those two types of imperfections meant that he failed to relate the discussion to Coase's (1937) theory of the firm (Ibid). In distinguishing themselves from Hymer's argument, and providing their insights into transaction cost theory and the TNC, McManus (1972), Buckley and Casson (1976), Hennart (1982), and Dunning and Rugman (1985) argued that market imperfections are inherent or natural consequences of dealing in a market because neoclassical assumptions of perfect knowledge and perfect competition cannot be realized (Hosseini, 2003).

The above-mentioned writers developed various models of FDI. According to Norman, the basic idea in these models was that: “incomplete contracts and missing markets give rise to the possibility of opportunistic behavior in arms-length exchange (Williamson, 1975) and so to the preference by the firm to replace external contracts by direct ownership and internal hierarchies” (Norman, 2001).

In addition to the transaction cost theory emphasized by writers such as Teece, two important paradigms emerged out of these arguments. The first of these was the internalization paradigm, which came from the writing of Buckley and Casson (1976), Casson (1983), and Rugman (1982). As argued by Rugman, internalization is a general encompassing theory which can explain FDI. According to this theory, whenever an intermediate product or some special raw (Hosseini, 1985,2003,2005) material is needed as an input for an enterprise and it is cheaper to cooperate with the supplier instead of buying it at the market, it is possible for the firm to internalize the supplier. An important pre-requisite for internalization (which can be done vertically or horizontally) is the existence of an imperfect market.

Internalization is linked (or, should be linked) to transaction cost theory. For example, according to Teece, “The internalization paradigm developed in the literature to date needs to have transaction costs economics embedded within it if a deep understanding of the transnational corporation is to evolve” (Teece, 1986).

Merging the above theories, Dunning has come up with his eclectic paradigm. According to this paradigm (Dunning 1980, 1988, 1993), FDI takes place in these different situations: (1) The MNC possesses ownership advantages that are not available to the host country firms. These advantages can be tangible (such as superior technology, superior product, or transferable economies of scale and scope), or they can be intangible (brand name, trade mark, etc.). (2) There can be some locational advantages that would make the investment (i.e. FDI) in the host country more profitable or easier than exporting to that country. This can be because of the market size, transportation costs, tariff or non-tariff barriers, or severe anti-dumping laws. (3) Internalization

advantages, when the TNC believes that its ownership advantages are best exploited internally (through FDI, etc.), rather than sold directly through spot markets, or offered to other firms through contractual arrangements such as licensing, the establishment of joint ventures, or managerial contracting. It is in terms of the third element that Dunning's eclectic paradigm and the internalization paradigm of Rugman, Casson, etc. are similar. Rugman (1981) argues that the concepts of ownership and location as proposed by Dunning (1980, 1988, 1993) are accounted for in the internalization paradigm. Buckley (1988) suggests that Dunning's ownership advantages result in double counting.

The issues raised in the internalization-eclectic paradigm debate have given rise to other research activity. Some writers have employed game theory approaches (and concepts like Nash equilibrium) in dealing with issues. Examples include research by Hortsman and Markusen (1995), Motta (1992), and Motta and Norman (1996). These writers have treated the choice between FDI and exploring as a purely strategic issue.

Researchers have also approached the issues in terms of information asymmetry and public good related characteristics. For, as some have argued, a TNC decides to internalize because knowledge-based ownership advantages have public good characteristics, and give rise to informational asymmetry, and thus moral hazard and adverse selection (Markusen, 1995, Hosseini, 2005). Many writers have tried to model these informational asymmetries, demonstrating the difficulties of uninternalized choices such as licensing. For example, because of non-exclusivity property of new knowledge, a firm may not want to reveal its process or product technology to a potential host country licensee (Hosseini, 2005). The TNC may fear that the licensee would reject the deal made, thus, acquiring the technology free of charge. Conversely, the licensee too may be fearful, not knowing what would it end up getting from the TNC. Under such circumstances, no licensing deal will be made, and the TNC will internalize. Examples of such research done include the papers by Ethier (1986), Teece (1986), Rugman (1986), and Hosseini(1985,2003).

Establishing Basic Models

The author assumes that both host country and transnational corporations are legitimate objects with complete and independent “personality” to pursue interest; and there is only one strategy for the game theory: preferential policy (B) and investment scale (Qw); then created the static game theory model and dynamic game theory model under the assumption of full access to information. The author then studied the relationship between the foreign investment preferential policy formulated by host country and the transnational corporation’s investment scale.

Static analysis with full access to information ~ Nash Equilibrium

First of all, the author made use of static game model to describe and analyze the game behaviors between the host country and transnational investors. Both players have full access to information in the game. The static game model also stresses that both transnational corporation and host country take actions simultaneously in the game. Both players have full access to information before they take actions, but have no idea about the strategy taken by the rival and the outcome of the game. Both players have to rely on the information on hand and assume that the rival is absolutely rational to predict the strategy taken by rival in order to determine the optimal strategy.

The decision function for the investment scale of transnational corporation

The transnational investors, or the entire transnational investors, refer to a group made up of the personalized investors with clear investment motives and certain level of capital and technical advantage and their investment behaviors are completely rational. This group consists of all transnational investors and the potential transnational investors in a host country or region. The transnational corporation’s investment scale refers to the total amount of investment invested by all transnational investors in a host country.

The author simplifies the transnational investors’ maximization issue as follows: to select the optimal investment scale in order to maximize the return on investment under certain restrictions; then derive the response function for the transnational corporations under following assumptions.

1. As the host country’s capital scale increases, ROI decreases. There is an optimal investment scale (Qw) to maximize ROI for transnational corporations. At that scale, MR=MC and ROI is maximum for the transnational corporation. Therefore, the first conclusion for the maximization of the transnational investment is that the investment scale (Qw) equals the optimal scale, or $Qw=\underline{Qw}$.
2. Transnational corporations determine their optimal investment scale according to a number of factors. Return on Investment (r) is undoubtedly the most important factor, followed by $\partial \underline{Qw}/\partial r>0$, which means that the transnational corporations increase their investment

scales as ROI increases provided that the maximization of ROI is guaranteed.

3. A number of factors determine the return on investment for the transnational corporations. Based on the nature of the research, the author defines ROI as the function r(B,H) of the host country's investment environment (H) for the transnational corporations' preferential policy (B). Apparently, ROI increases as the investment environment is improved --- $\partial r/\partial H>0$. ROI also increases as the host country upgrades its preferential treatment for the transnational investors --- $\partial r/\partial B>0$. With $\partial r/\partial B>0$, the transnational corporations' investment scales can be defined as the function of B and H.

$$\frac{\partial Q_W}{\partial B}$$

$$\frac{\partial Q_W}{\partial H}$$

Qw(H,B) and >0 , >0

The transnational corporations' optimal investment scales increases as B and H increase. For the convenience of analysis, Qw(H,B) is defined as a linear function as follows:

$$Qw(H,B)= a \cdot B+b \cdot H$$

a and b represent the transnational corporations' preference for the host country's preferential policy and the investment environment respectively and, on the other hand, represent the relative importance of host country's investment environment and preferential policy formulated for the transnational investors.

a and b are relative indexes. b can be defined as 1 provided that the basic information is not lost; and the relative conditions between a and b can be obtained through the changes of a. When a=1, the investment environment and the preferential policy are equally important for the transnational corporations. When a>1, the preferential policy is more important for the transnational corporations or the preferential policy contributes more revenue to the transnational corporations. When a<1, the investment environment is more important to the transnational corporations. Therefore, the foregoing function can be simplified as:

$$Qw= a \cdot B+H \quad (1)$$

As shown by (1), under the host country's investment environment and preferential policy, the transnational corporations pursue the maximization of their revenue and determine their investment scales in accordance with (1). In the game theory analysis, this function is known as the response function for the transnational corporations.

Host country's revenue function derived from transnational corporations' investment

The host country stated in this paper refers to a personalized entity with clear and rational revenue goal. This assumption excludes the contradiction and competition among the internal interest groups of the host country; also excludes the inefficiency resulted from the internal competition taking place in the formulation and implementation of the policy. The basic behavior characteristics of the game between the host country and transnational corporations are the focus of research.

If the host country's game strategy is limited to preferential policy, its policy can be interpreted as the best preferential policy (optimal preferential level) to attract maximum investment under certain constraints.

A number of factors determine the host country's revenue. The relation between the transnational corporations' investment scale (Qw) and the host country's revenue (Rd) can be represented by the quadratic function as follows:

$$Rd=\underline{Rd}-k(\underline{Qd}-Qw)^2 \quad (2)$$

k is known as the revenue loss coefficient for the host country; and is a general parameter determined by a number of constant factors.

$\underline{Rd}$ is the host country's potential maximum revenue derived from the transnational corporations' investment.

Rd is host country's revenue.

$k \cdot (\underline{Qd}-Qw)^2$ is the potential revenue lost by host country resulted from the inconsistency between the transnational corporations' investment scale (Qw) and the transnational corporations' optimal investment scale required by host country ($\underline{Qd}$).

When Qw= 0, assume Rd=0 in (2); then

$\underline{Rd}= k \cdot \underline{Qd}^2$

Therefore, (2) is re-defined as,

$$Rd=2 k \cdot \underline{Qd} \cdot Qw- k \cdot Qw^2 \quad (3)$$

For the purpose of research, the author includes the host country's preferential policy (B) in host country's revenue function (3); then (3) is redefined as,

$$Rd(\underline{Qd},Qw,B)=2 k_1 \cdot \underline{Qd} \cdot Qw- k_1 \cdot Qw^2- k_2 \cdot B \cdot Qw \quad (4)$$

Based on the understanding of the signs contained in the function, the host country's' investment revenue derived from the transnational corporations is defined as $2 k_1 \cdot \underline{Qd} \cdot Qw$; and the remaining portion ($k_1 \cdot Qw^2+ k_2 \cdot B \cdot Qw$) is defined as the host country's costs derived from transnational corporations' investment. Therefore, the host country's maximization option is as

follows:

$$\text{Max}: Rd(\underline{Qd},Qw,B)= 2k_1 \cdot \underline{Qd} \cdot Qw-(k_1 \cdot Qw^2 + k_2 \cdot B \cdot Qw) \quad (5)$$

The marginal condition – optimal strategy – can be derived from (5), which means that the marginal cost equals the marginal revenue derived from transnational corporations' investment. The partial derivative of Qw derived from the revenue function is the transnational corporations' investment scale selected by the host country in order to attract investment tomaximize its revenue, which means:

$$\frac{\partial Rd(Qw,B)}{\partial Qw}$$

$$= 2k_1 \cdot (\underline{Qd}-Qw)- k_2 \cdot B$$

$$\frac{\partial Rd(Qw,B)}{\partial Qw}$$

Let $= 0$

$$\frac{k_2}{2k_1}$$

then: $Qw+ \cdot B = \underline{Qd}$ (6)

B, k_1, and k_2 are larger than 0, therefore

$Qw < \underline{Qd}$

Based on the aforesaid inference, the following assumption is concluded.

Assumption 1: When preferential policy exists, the transnational corporations' optimal investment required by the host country is smaller than the capital gap.

As shown by Figure 1, the curves concave towards left are iso-revenue curve for the host country. The host country's revenue derived from investment decreases from left to right. Line L represents the capital cap of host country; and doesn't change when the preferential policy changes. Lm represents the optimal scale of foreign investment required by host country. As shown by the Figure, the scale of foreign investment required by host country decreases and the difference of "gap scale" expands continually when the preferential treatment is upgraded. As soon as the preferential treatment reaches or exceeds a certain limit ($2\underline{Qd} \cdot k_1/k_2$), no transnational corporations' investment is needed even though capital gap still exists, because the cost to attract foreign investment is too high for the host country.
Following function is derived from (6),

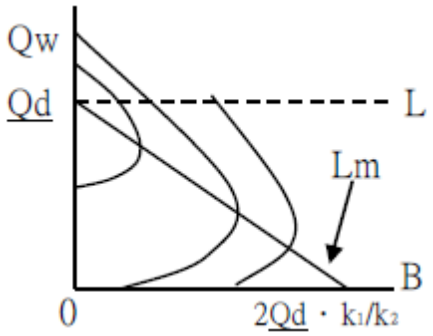

Figure 1. The iso-revenue curve for the host country.

$$B = 2k_1/k_2(\underline{Qd}-Qw) \quad (7)$$

(7) is host country's response function for transnational corporations' investment. With the basic meaning of that function, following assumption is concluded:

Assumption 2: when the transnational corporations' investment scale is set at a certain level, the optimal preferential treatment for the maximization of host country's interest is in inverse ratio to the transnational corporations' investment scales; and is in direct proportion to the scale of host country's capital gap.

When $Qw=\underline{Qd}$, B=0. No preferential policy is needed. When $Qw<\underline{Qd}$ and $\underline{Qd}-Qw>0$, there is a certain level of capital gap for the host country; B>0. Preferential policy is needed to attract transnational corporations' investment at this time. As the difference between host country's capital gap and the transnational corporations' investment expands, the preferential treatment has to be upgraded in order to attract foreign investment to fill up the gap. If $Qw>\underline{Qd}$ and B<0, the host country attracts more foreign investment than its economy can accept and use. With the excessive foreign-capital-attracting costs, the host country has to reduce the transnational corporations' investment according to its needs.

The confirmation of game equilibrium

The host country and the transnational corporations take actions simultaneously in the game. Both players predict the rival's possible moves according to the information on hand; and then select the moves to maximize their interest. When information is sufficient, the transnational corporation and host country have full information about rival's response functions and, therefore, their decision-

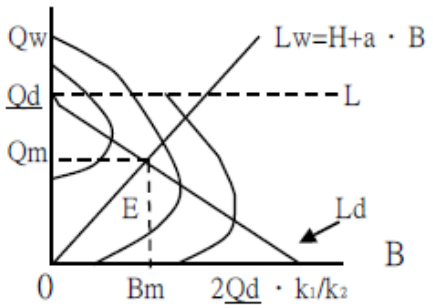

Figure 2. The response function of the transnational corporation and host country.

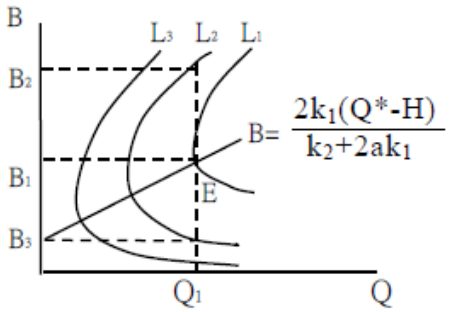

Figure 3. Host country's iso-revenue curve concave towards upper right.

making process is reflected upon the rival's response function curve and they select the appropriate strategy to maximize their interest. Assume that both players' messages are symmetrical. The strategies selected by both players overlap each other. The intersection point is the equilibrium point for the game, which is also known as Nash Equilibrium. The mathematic expression of that process is the quadratic equation made up of both players' response functions as follows:

$$B=2k_1/k_2(Qd-Qw) \quad (8)$$

$$Qw=a \cdot B+H \quad (9)$$

When (8) and (9) are combined as simultaneous equations, following solutions are obtained:

$$Bm=(2k_1 \cdot Qd-2k_1 \cdot H)/(k_2+2a \cdot k_1) \quad (10)$$

$$Qm=(2a \cdot k_1 \cdot Qd+k_2 \cdot H)/(k_2+2a \cdot k_1) \quad (11)$$

(Bm,Qm) is the equilibrium point for the game between the host country and transnational corporation, also known as Nash Equilibrium. If the transnational corporations' investment scale is Qm, the host country's optimal preferential treatment is Bm. If host country's preferential treatment for foreign investment is Bm, the transnational corporations' optimal investment scale is Qm.

As shown by Figure 2, Lw is the response function of the transnational corporation and Ld is the response function of the host country. Both lines intersect at E(Bm, Qm), the equilibrium point of the game.

Following assumption is obtained through the in-depth analysis of the foregoing equilibrium:

Assumption 3: When other conditions remain unchanged, the host country's most preferential treatment expands as the capital gap enlarges so as to maximize the revenue of capital-attraction. However, the level of expansion depends on the host country's cost coefficient and revenue coefficient of foreign-capital-utilization as well as the transnational corporation's preference for the host country's preferential policy.

As shown by Figure 3, L_1~ L_3 are host country's iso-revenue curve concave towards upper right, meaning that the host country's revenue increases continually. This figure tells that the potential revenue that the host country obtains from the transnational corporation's investment increases as the capital gap enlarges, because the host country's capital requirement for the transnational corporations decreases as the host country's capital gap enlarges. Therefore, the foreign investment's marginal production increases and the host country's revenue derived from utilization of foreign investment increases, too. This is known as, "Rare products are valuable."

Assume that Qd_1 is the capital gap for the host country and B_1 is the most favorable preferential treatment. If the host country selects B_2 as its policy, its foreign investment policy is comparatively more favorable than its foreign capital requirement scale, and the transnational corporation's investment scale is larger than the host country's capital requirement and cannot be accepted by the host country and cannot secure the support from the production elements and, consequently, cannot be utilized to the fullest extent. In such case, the transnational corporation's investment does not make much contribution to the host country's economy and the negative effect increases. In addition, the host country loses revenue due to the excessive preferential policy. Therefore, it is irrational for the host country to choose B_2 at Qd_1.

If the host country selects B_3 as its policy, the preferential treatment of its policy is below the preferential treatment that can absorb the same amount of foreign investment as the capital gap. The foreign

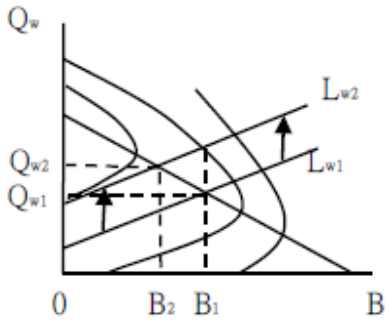

Figure 4. Host country's investment environment.

capital absorbed by the preferential treatment is less than the capital gap. With the "remaining" capital gap, the host country's revenue is still below the optimal level.

As shown by Figure 3, the host country's revenue is L_2 at (Q_1,B_2) and (Q_1,B_3); and L_1 is the policy at (Q_1,B_1), which is larger than the revenue at (Q_1,B_2) and (Q_1,B_3). Therefore, the host country should choose B_1 as the preferential treatment of its policy if its capital gap is Q_1.

If the dots of host country's optimal preferential treatment at all levels of capital cap are connected, the curve B=f(Q) is obtained. The straight line lies on Q axis with H as its intercept and $2k_1/(k_2+2ak_1)$ as its slope. This figure indicates that the changes of the optimal level of host country's preferential policy resulted from the changes of capital gap decreases as the host country's foreign-capital-utilizing cost coefficient k_2 increases; and increases as revenue coefficient k_2 increases; and decreases as the transnational investor's preference for host country's preferential policy increases.

Assumption 4: When other conditions remain unchanged, the host country's optimal level of foreign investment policy decreases as the investment environment is improved so as to maximize the revenue of capital-attraction; and increases as the investment environment deteriorates. The host country's revenue will be upgraded significantly as the investment environment is improved.

As shown by Figure 4, when the host country's investment environment is upgraded from H_1 to H_2, the transnational corporation's response line moves from L_{w1} to L_{w2} and the host country's preferential policy moves from B_1 to B_2, which means that the host country's revenue is upgraded.

If the host country does not reduce its preferential treatment after its investment environment is improved, the marginal revenue will be lowered notwithstanding the transnational corporation's investment scale is larger than Q_{w2}.

Restrictions

Please note that, as far as the capital-attracting methods are concerned, there is a certain level of substitution between the preferential policy and investment environment of the host country for the transnational corporations.

The host country's foreign-capital-utilizing cost coefficient, revenue coefficient and the transnational corporation's investment preference determine the substitution ration between these two factors.

Generally, the investment environment's substitution for the preferential policy plays the vital role and this substitution is essential, meaning that the improvement of investment environment requires the host country to loosen its preferential policy. Otherwise, the host country's improvement of investment environment will not result in a higher level of revenue and its revenue may possibly be reduced.

However, the situation can be completely different if the stability of foreign investment policy and the policy-adjusting costs are included into consideration. The transnational corporations are highly concerned of the stability of policies, because the stability determines the level of risk for their investment. If the host country frequently adjusts its foreign investment policy according to the changes of investment environment in order to maximize its policy effect, the stability of policy and the transnational corporations' interest will be affected to a certain extent.

On the other hand, the policy-adjusting costs increase and the host country's foreign-capital-utilizing revenue decreases if the policy is adjusted too often. As a result, the host country has to maintain its foreign investment policy at the second best condition in a certain period of time. Actually, the partial second best condition is the mandatory assurance for the maximization of the host country's revenue.

Therefore, the paradox between the flexibility and stability of foreign investment policy can be found in each phase of foreign investment policy and is a reality that we have to tackle. This paradox deserves further research in the future.

Dynamic analysis with full information ~ Stackelberg Equilibrium

This section deals with the game process concerning the host country's attraction of transnational corporations' investment. The basic assumptions are as follows:

(1) Assume that the information transmitted in the game process is sufficient. The host country can transmit its messages to the transnational corporations at no costs and, on the other hand, the transnational corporations can investigate and obtain all information regarding the investment environment of host country at no costs.
(2) Assume that the host country takes action first; and has no idea about the action to be taken by transnational corporations when it makes decision. The host country has to predict the transnational corporation's moves according to the information on hand. The transnational corporations take actions later. Therefore, the transnational corporations take actions after observing the host country's actions.

The confirmation of game equilibrium

The author takes inverse inference method to confirm the equilibrium of the game. The first step is to analyze the maximization behavior of the transnational corporations. The author use the results of analysis stated in previous sections – the transnational corporations desire to maximize their investment revenue and respond to the host country's actions according to the function as follows:

$$Q(H,B)=a \cdot B+H$$

As shown by following function, the game equilibrium substantially refers to the maximization options taken by the host country under the constraints imposed by the transnational corporation's response function. The host country's revenue function is the same as the maximization option as follows:

$$\text{Max}: Rd(Qw,B)=2k_1 \cdot \underline{Qd} \cdot Qw-(k_1 \cdot Qw^2+k_2 \cdot B \cdot Qw) \quad (12)$$

$$\text{S.t}: Qw(H,B)=a \cdot B+H \quad (13)$$

$$B=0,\ H>0 \quad (14)$$

Let $k_1=k_2=1/2$, $a=1$

When (12), (13), and (14) are combined as simultaneous equations, following solutions are obtained:

$$Bm=Q/2-3H/4 \quad (15)$$

$$Qm=Q/2+H/4 \quad (16)$$

As shown by Figure 5, (Bm,Qm)is the equilibrium of the game. The transnational corporations' response line intersects the host country's iso-revenue line at M(Bm, Qm), which is the equilibrium point of the game. The action model and equilibrium feature of the game are similar to the Stackelberg Equilibrium stated in "Price leadership". Therefore, M(Bm, Qm) is known as the Stackelberg Equilibrium for the transnational corporations.

With the aforesaid conclusions, following assumption is obtained:

Assumption 5: based on the Stackelberg Equilibrium obtained from the dynamic analysis with full information, the conclusion obtained by the author is consistent with Nash Equilibrium analysis – the host country's optimal preferential treatment is in direct proportion to the scale of host country's capital gap, and is in inverse ratio to the preferential level of the investment environment.

As indicated by further analysis, there are significant differences between both equilibriums in several aspects. As shown by Figure 5, M(Bm, Qm) is the Stackelberg Equilibrium of the dynamic game with full information and $E(B_1,Q_1)$ is the Nash Equilibrium of static game with full information; of which,

$B_1=2(Qd-H)/3$
$Q_1=(2Qd+H)/3$

After comparing (Bm,Qm) and (B_1,Q_1), following assumption is obtained:

Assumption 6: under the same conditions, the preferential level and transnational corporations' investment scale of Stackelberg Equilibrium under the dynamic game are lower than that of the Nash Equilibrium created by the static game; and the host country's revenue is higher.

The host country's "initiative advantage" determines the changes of the game. The transnational corporations take their actions after the host country's strategies are finalized. Therefore, the host country's strategies restrict the transnational corporations' alternatives. As a result, the host country can affect, or control, the transnational corporations' investment decisions to a certain extent through various strategies and, consequently, can take initiatives in the game. The transnational corporations simply follow the host country's moves. It is not a surprise to note that the host country's revenue increases and the transitional corporations' revenue decreases.

Constraints

In reality, the host country's "initiative advantage" exists.

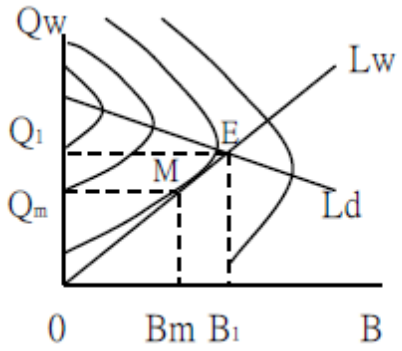

Figure 5. The game equilibrium.

However, how much benefit can be created for the host country is still up to other factors and is not so clear as stated in the analysis. When facing the transnational corporations, whether the internal fractions can be united together remains a question. If not, all fractions will compete against one another. In such case, the "initiative advantage" will be destroyed completely.

Even if the internal fractions do not exist, the host country's "initiative advantage" cannot solve all problems, because the advantage exists only in the phase that the host country attracts foreign investment. In the second phase of the game, which starts after the investment agreement is signed, the transnational corporations obtain "initiative advantage" and are in an advantageous position with respect to revenue distribution. The revenue created in both phases determines the host country's overall revenue derived from transnational corporations' investment. Therefore, it is unlikely to obtain the macro concept to determine the host country's revenue from the "initiative advantage".

Extending the basic model

In this section, the author loosens the assumption that the transnational investors are made up of a group of investors with identical investment behaviors; and divide the transnational investors into two categories according to the scale and quality of investment and redefine the scale and quality of investment based on the new definition.

Under the assumptions that the information is complete and the investment behaviors of various transnational corporations are highly condensed, the authors created the model to determine the types and scale and quality of transnational investors and internalize the externalized investment environment through the function between the creation of investment environment and the host country's improvement of investment environment in this section.

Scale and quality and types of transnational corporations' investment

Based on the scale and quality of the transnational corporations' investment, the author divides the transnational corporations' investment into two categories: "large scale and high quality investment of transnational corporations" and "small scale and low quality investment of transnational corporations".

Large scale and high quality investment of transnational corporations

The large transnational corporations of USA, Japan, and Europe are major players representing the large scale and high quality investment of transnational corporations. These investors have solid capital and advanced technology and are highly competitive in the international market. Therefore, they are concerned about long-term interest; follow certain rules in their administration; maintain outstanding business performance; pay attention to the corporate image and corporate culture as well as the coordination with the host country in all aspects.

These enterprises are very concerned about the technology transfer of system guidance including employee training. Their attitude is, to a large extent, out of the needs of business development. However, they make remarkable contributions to the host country with respect to the training of high quality manpower for advanced technology and administration experience. These enterprises set their goals based on their long-term objectives. They are particularly concerned of the host country's investment environment, especially the factors that may affect their business performance in the long run, such as the economic development progress, market scale, as well as the stability and transparency of policy. Sometimes, they make adverse selections of the preferential policy. Therefore, these investors can be called "environment preferential" transnational investors.

Small scale and low quality investment of transnational corporations

The labor-intensive industries are mainly the trans-national investors with small scale and low quality investment. Compared to the foregoing foreign invest-ment, these investors are smaller; their technology is lower; and their competitiveness is quite limited in the international market. Therefore, they tend to pursue short-term and large amount of profit.

As indicated by the study of the tendency of the investment decisions, the transnational corporations with

small scale and low quality of investment do not expect much from the investment environment. However, they prefer the preferential policy particularly. Their preference can be understood easily. The preferential policy increases short-term revenue more effectively than the investment environment does. Therefore, the transnational corporations with small scale and low quality of investment are called “policy preferential” transnational investors.

The game between the host country and two types of transnational investors

For the convenience of analysis, the author makes the assumptions and definitions for the behavior characteristics of the transnational corporations’ investment and the host country as follows:

(1) Assume that the “policy preferential” transnational investors with small scale and low quality of investment are not concerned of the host country’s investment environment. The deciding function of their investment scale (response function) can be defined as the function of the preferential policy as follows:

$Q_1=f_1(B)$

Q_1 is the transnational corporation’s investment scale. B is host country’s preferential treatment for the transnational corporation’s investment. Apparently, the transnational investment scale increases as the host country gives more preferential treatment to the transnational corporation’s investment. Therefore:

$dQ_1/dB>0$

For the convenience of analysis, the authors assume that the “policy preferential” transnational corporations only respond to the preferential treatment of the host country’s foreign investment policy and there is a simple linear relationship between the investment scale and the investment environment. Therefore, the function is simplified as,

$Q_1=B$

(2) Assume that the “environment preferential” transnational corporations with large scale and high quality of investment do not respond to the preferential policy of the host country. They make decisions according to the quality of the host country’s investment environment only. Therefore, the decision function of their investment scale (response function) can be defined as,

$Q_2=f_2(H)$

H is the host country’s investment environment. As H increases, the host country’s investment environment is improved and the transnational corporation’s investment scale grows. Therefore, the function can be simplified as follows:

$Q_2=H$

(3) Assume that the host country faces both types of transnational corporations simultaneously. The host country can separate both transnational corporations based on all information on hand; and can treat both transnational corporations differently by various means in the formulation and implementation phases of the foreign investment policy. The “environment preferential” transnational corporations are more contributive to the host country and, consequently, the host country tends to attract these transnational corporations. However, these transnational corporations simply respond to the host country’s investment environment. The investment scale remains a certain level and is free from the influence of the host country’s preferential policy under certain investment environment. If the investment scale is smaller than the transnational corporation’s investment scale required by the host country, the host country will announce preferential policy in order to attract the “policy preferential” transnational corporations to make up with the “remaining” needs of foreign investment.

The host country’s revenue function derived from the transnational corporation’s investment

In this section, the transnational corporation’s monopoly over the host country’s economy and the host country’s costs resulted from the damages of its sovereignty as well as the host country’s costs related to attracting investment are put aside temporarily. Based on (3.4), the host country’s revenue function is defined as follows:

$R(Q_1,Q_2,B)= 2\ k_1Qd(Q_1+Q_2)-k_1(Q_1+Q_2)^2-k_2BQ_1$

Assume that the host country’s investment environment H is a constant and, therefore, the “environment preferential” transnational corporation’s investment scale remains unchanged:

$Q_2=H$

The host country’s “remaining gap” is,

$Qd-Q_2=Qd-H$

At this time, the host country needs to absorb the investment from the “policy preferential” transnational corporations to make up with the remaining capital gap.

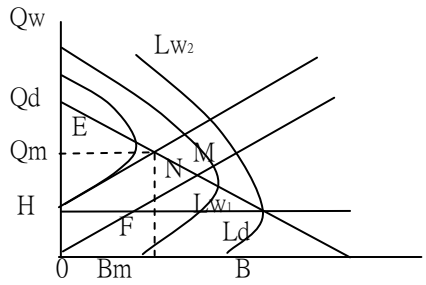

Figure 6. the host country's demand curve for the transnational corporation's investment.

Therefore, the revenue obtained by the host country from these transnational corporations' investment is,

$R(Q_1,B)= 2k_1Q_1(Q_d-H)-k_1Q_1^2-k_2BQ_1$
Let $\partial R/\partial Q_1=0$
$2k_1$
k_2
Thus,

$B=$ $(Qd-H-Q_1)$

This is the host country's demand function for the "policy preferential" transnational corporation's investment.

The host country and "policy preferential" transnational corporations' demands

Find solutions from the following quadratic equations:
$2k_1$
k_2

$B=$ $(Qd-H-Q_1)$ (17)

$Q_1=B$ (18)

When (17) and (18) are united as a simultaneous equation, following solutions are obtained:

(1) $2k_1$
$2k_1+k_2$

The optimal level for the preferential policy of host country:

$Bm= Q_1=$ $(Qd-H)$ (19)

(2) The total investment for the transnational corporations' investment:

1
$2k_1+k_2$

$Qm= Q_1+Q_2 =$ $(2k_1Qd+k_2H)$ (20)

(3) The ratio between two types of transnational corporations' investment:

$2k_1$
$(2k_1+k_2)H$
Q_1

$Q_2 =$ $(Qd-H)$ (21)

(4) The ratio of "policy preferential" transnational corporations' investment to total investment:

$(2k_1+ k_2)H$
$2k_1Qd+ k_2H$
Q_1
$Qm = 1-$ (22)

(5) The ratio of "environment preferential" transnational corporations' investment to total investment:

$(2k_1+ k_2)H$
$2k_1Qd+ k_2H$
Q_2
$Qm =$ (23)

The foregoing analysis can be explained clearly through Figure 6 as follows:
In Figure 6, Ld represents the host country's demand curve for the transnational corporation's investment. The curve convex towards right is the host country's iso-revenue line. The host country's revenue decreases from left to right. L_{w1} is the "environment preferential" transnational corporation's investment supply curve (response curve) that intersects Qw axis and is parallel with B axis with H as intercept, meaning that the "environment preferential" transnational corporation's investment scale is not under the influence of the host country's preferential policy and is determined by the host country's investment environment. L_{w2} is the "policy preferential" transnational corporation's investment supply curve (response curve), which lies above L_{w1} with 1 as its slope.
If L_{w1} is considered the axis of coordinate, the host country's investment demand curve above L_{w1} can be

considered the host country's "remaining demand" curve or the host country's "remaining demand" curve (response curve) for the "policy preferential" transnational corporation's investment. The line EF between intersection E and L_{w1} is the "policy preferential" transnational corporation's investment scale Q_1. The intersection corresponds to B, which is the optimal level of the preferential policy of the host country.
Following assumption is derived from the foregoing analysis:

Assumption 7: the host country's revenue derived simultaneously from the investment of both types of transnational corporations is larger than the revenue derived from any single type of transnational corporation.

As shown by Figure 6, a line parallel to L_{w2} is drawn from the origin to intersect Ld. The vertical axis of the intersection point M represents the foreign investment scale when the host country absorbs "policy preferential" transnational corporations' investment only. The host country's iso-revenue line at the intersection indicates the host country's revenue, which is undoubtedly smaller than the revenue at E. if the host country absorbs the "environment preferential" transnational corporation's investment only, the intersection N of L_{w1} line and Ld line represents the revenue of host country's iso-revenue line, which is obviously smaller than the revenue at E.

Creation of transnational corporation's investment structure

As indicated by the analysis, when the host country faces both types of transnational corporations simultaneously and follows the assumptions stated in previous sections to select investment and formulate policy, the structures of both types of transnational corporations and the corresponding scale and quality of investment are determined by the host country's investment environment.
If the host country's investment environment is extremely terrible, H=0,

$Q_1/Qm = 1$
$Q_2/Qm = 0$

The "environment preferential" transnational corporations will cease to invest. The host country can absorb the "policy preferential" transnational corporations' investment. In such case, the host country's terrible investment environment becomes an unbreakable barrier to the highly competitive "environment preferential" transnational corporations. Without the tremendous competition imposed by the large transnational corporations, "policy preferential" the transnational corporations are well protected under this barrier. In an effort to secure the investment of the transnational corporations, the host country provides sufficient preferential policy to the transnational corporations and, consequently, the host country's costs related to utilizing the transnational corporation's investment increases dramatically. Therefore, the host country's revenue is lower.

If the host country's investment environment is excellent, the host country becomes attractive to the "environment preferential" transnational corporations and, therefore, the host country can absorb the "environment preferential" transnational corporations' investment to make up with its capital gap, which means

$Q_1 / Qm = 0$
$Q_2 / Qm = 1$

At this time, the "environment preferential" transnational corporations are the only investors. The "policy preferential" transnational corporations abandon their investment. In this situation, the host country's capital gap is filled up completely and the "policy preferential" transnational corporations' investment is no longer needed. Naturally, the "policy preferential" transnational corporations lose the incentives for the preferential policy that compensates the damages of interest; and thus the "policy preferential" transnational corporations lose their interest in investment. In addition, the "environment preferential" transnational corporations are highly competitive and are capable of destroying the existence conditions of the "policy preferential" transnational corporations through their competition in the product market and their competition with the host country for the rare materials and eventually drive the "policy preferential" transnational corporations out of market. Therefore, the "environment preferential" transnational corporations become the only investors.

The foregoing analysis indicates the vital role of the host country's investment environment in the scale, quality, and structure of the transnational corporations' investment. This concept is further justified in the dynamic analysis as shown in Figure 7.

Furthermore, the author assumes that the host country's investment environment is improved continually as time passes by. H increases from H_1 to H_2. As shown by the figure, the "environment preferential" transnational corporations' response curve moves from H_1 to H_2 and the "policy preferential" transnational corporations' response curve also moves at the same time. This response curve intersects the transnational corporations' investment demand curve at E_1; then moves to E_2. The changes can

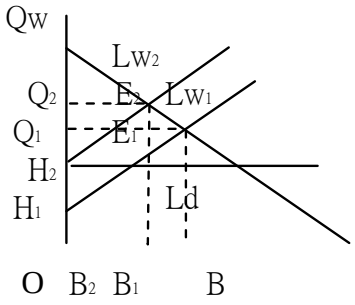

Figure 7. dynamic analysis.

be divided into 4 groups.

(1) The total scale of the transnational corporations' investment increases from Q_1 to Q_2.
(2) The absolute level and the comparative percentage (the percentages in total investment) of the "environment preferential" transnational corporations' investment scale increase. The absolute scale increases from OH_1 to OH_2. The percentage in total investment increases from OH_1/Q_1 to OH_2/Q_2.
(3) The absolute level and the relative percentage of the "policy preferential" transnational corporations' investment scale decrease continually. The absolute scale decreases from H_1Q_1 to H_2Q_2. The relative percentage decreases from H_1Q_1/Q_1 to H_2Q_2/Q_2.
(4) From the host country's standpoint, the improvement of investment environment increases the investment of transnational corporations (from Q_1 to Q_2) and lower the preferential policy from B_1 to B_2, thereby increases the revenue derived from utilization of foreign investment.

The results of foregoing analysis are summarized as follows:

Assumption 8: When the host country faces two types of transnational corporations with varied preference for its investment environment and preferential policy, if the host country tends to absorb the investment of the transnational corporations with higher quality and higher preference for investment environment and is capable of separating both types of transnational corporations by foreign investment policy, the host country's investment environment will be improved as:

(1) The transnational corporations' investment scale being used by the host country expands continually.
(2) The absolute level and relative percentage of the "environment preferential" transnational corporations' investment scale increase simultaneously and the absolute level and relative percentage of the "policy preferential" transnational corporations' investment scale decrease simultaneously; and the total scale and quality of transnational corporations' investment are upgraded at the same time.
(3) The host country's revenue derived from the transnational corporations' investment increases continually.
(4) The host country's optimal preferential treatment decreases at the same time.

It is necessary to point out that the previous analysis implicitly suggests that the host country's strategy – the formulation and implementation of foreign investment preferential policy – can respond timely and accurately to the changes of its conditions and the external factors and maintain the optimal condition under all conditions. However, the host country's costs for adjusting policy will increase dramatically if the host country does not understand the transnational corporations and lacks the experience of using foreign investment. If the host country has the trouble with internal fractions' competition and, as a result, its foreign investment policy becomes biased, this assumption does not make any sense at all.

The host country's optimal decision to improve the investment environment

The host country's investment environment has been considered an external variable in the previous analysis. As such, it is likely to overlook the host country's costs associated with its use of "environment preferential" transnational corporations' investment. The following dynamic analysis will include the host country's improvement of investment environment into the analysis; and thus internalize the investment environment and study how the host country decide to improve its investment environment to the optimal level.
H (C) represents the "production function" of the investment environment. H is the investment environment. C is the costs for improving investment environment. Assume that the scale revenue of investment environment decreases; then:

$dH / dC > 0$
$d^2H / dC^2 < 0$

Assume that the host country's cost for improving investment environment as 0; the initial value of its investment environment is also 0, meaning H(C=0)=0.

The investment environment's "production function" is curve H(C) shown in Figure 8.
Based on the description of the behaviors of the "environment preferential" transnational corporations' investment (investment environment determines the

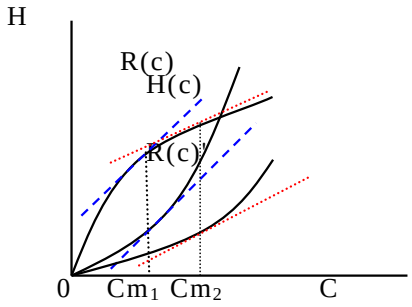

Figure 8. The investment environment's "production function" curve.

investment scale), the authors found that,

$Q_2 = H(C)$, and $dQ_2/dC>0$

According to the equilibrium between the host country and two types of foreign investment, the authors found that,

$$\frac{2k_1}{2k_1+k_2}$$

$$Q_1 = \frac{2k_1}{2k_1+k_2}(Qd-H(C)) \quad (24)$$

$$\frac{1}{2k_1+k_2}$$

$$Q_1+Q_2 = \frac{1}{2k_1+k_2}(2k_1Qd+k_2H(C)) \quad (25)$$

Find the derivatives against (24) and (25) to obtain the cost C for improving investment environment, the authors found that,

$dQ_1 / dC<0$

$d(Q_1+Q_2) / dC>0$

The foregoing analysis can be summarized as follows:

Assumption 9: as the host country continues to improve its investment environment, the transnational corporations' investment scale grows continually, the structure of transnational corporations' investment and the overall quality are improved continually, and the host country's revenue increases at the same time.

Based on the aforesaid analysis, the more the host country improves its investment environment, the better. In other words, the larger the C the better. However, a fact is overlooked. To a certain extent, the host country makes use of the costs paid by the transnational corporations' investment to improve its investment environment. Therefore, the host country needs to have a thorough understanding of the foreign investment's overall revenue and contemplate the level of optimal investment environment in a systematic revenue function. Based on the purpose of the study, the author has included the costs of improving investment environment into the host country's revenue function and redefined the revenue function as follows:

$$R(C) = 2k_1Qd(Q_1+Q_2)-k_1(Q_1+Q_2)^2-k_2BQ_1-C \quad (26)$$

In this function,

$$Q_2(C)=H(C) \quad (27)$$

$$\frac{2k_1}{2k_1+k_2}$$

$$Q_1(C)= \frac{2k_1}{2k_1+k_2}(Qd-H(C)) \quad (28)$$

Include (27) and (28) into the host country's revenue function (29), and let $dR / dC=0$,

The author obtains,

$$\frac{1}{2k_1}\frac{dH}{dC} = (Qd-Q_1(C)-Q_2(C))>0 \quad (29)$$

(29) is the first-scale condition for maximizing the host country's revenue when the costs for improving investment environment are included into consideration. The authors also found that,

$$d^2H(C) / dC^2 >0 \quad (30)$$

Based on the foregoing analysis, the author infers the function, curve R (C) in Figure 8, representing the relationship between the host country's total revenue derived from foreign investment and the costs for improving its investment environment.

As shown in Figure 8, R(C) and H (C) have the same slope C_{m1} – the optimal investment environment for the host country. If the host country's capital gap or capital absorption capability is upgraded or its revenue coefficient derived from the transnational corporations' investment is upgraded, R(C) becomes flat as the R(C)' shown in Fiureg 8 and, at the same time, the host country's optimal endeavor to improve investment environment is upgraded to C_{m2}. This conclusion is practical and the reason is apparent. If the transnational corporations' investment benefits the host country significantly, it is reasonable to invest more to improve the

investment environment in order to attract the transnational corporations' investment.

The aforesaid analysis can be summarized as the following assumption:

Assumption 10: the host country's overall scale the quality derived from transnational corporations' investment is under the direct influence of investment environment and maintains a close relationship with the host country's endeavor to improve its investment environment. The host country's capital gap and its revenue coefficient determine the host country's optimal endeavor to improve its investment environment and maintain a direct proportion relationship with that endeavor.

CONCLUSION AND RECOMMENDATIONS

The author has analyzed the static and dynamic games with complete information between transnational corporations and host country and found the optimal solutions under the highly abstract assumptions. He has also found that, when other conditions remain unchanged, the optimal level of host country's foreign investment preferential policy is in direct proportion to its needs of foreign investment or the scale of capital gap, and is in inverse ratio to the level of its investment environment.

As indicated in the conclusion, the host country's investment environment determines the scale and quality of transnational corporations' investment when policy is at the optimal level. To maintain the transnational corporations' investment at the optimal level under the given conditions, the host country has to lower its foreign investment preferential policy as the investment environment is improved. The host country can also improve its investment environment to help the transnational corporations upgrade their investment and, the host country's capital requirement and revenue determine how hard the host country improves its investment environment.

It is assumed that the host country has only one strategy for its game the preferential policy for foreign investment. This assumption can possibly be loosened in the future and the host country's "external liberation" can be included in the analysis so as to analyze how the host country control the level of external liberation to improve the relationship between the foreign investment and its infrastructure. The author believes that this topic needs to be studied at the time that ROC is likely to join WTO.

The transnational investors can be divided into two categories to facilitate the in-depth analysis of the scale and quality of investment. By the same token, the host countries can be divided into central government and local government to facilitate the creation of the game model between both governments in order to interpret the relationship between capital-attracting scale and capital-attracting costs. This is an important topic with respect to the host country's formulation and implementation of foreign investment policy; and the new thoughts and theories can possibly be developed consequently.

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