

---

# Heterogeneity, Institutional Quality and the Entry Mode of Outward FDI

Li Guoxue    JCER and IWEP<sup>\*</sup>

## Abstract

Based on Helpman, Melitz, and Yeaple (2004), I develop a comprehensive theoretical model from the perspectives of heterogeneity and institutional quality to analyze entry modes of outward FDI both from developed and developing countries. Taking into account the matching friction from merged integration and differences in institutional quality and organization costs of export, cross board M&A and green-field investment, the firm chooses entry mode of outward FDI based on the tradeoff between institution-induced productivity effect and comprehensive relative cost advantages. Especially the effect of institutional quality on entry mode of outward FDI appears to be non-linear and is contingent on foreign relative capability to create productivity and cost advantages.

## 1. Introduction

According to World Investment Report 2011, the value of outward FDI from developing countries has surged to a high record in recent years. Different from the predictions by traditional FDI theories, a lot of outward FDI from developing countries flows to service sectors in developed countries. The geographical and industrial distributions of outward FDI from developing and transition economies have challenged traditional international economic theory.

### 1.1 New Trends in Global Outward FDI

With rapid economic growth of developing and transition economies, MNEs from these countries have become an important driving force of foreign direct investment. Especially during and after the global financial crisis, MNEs from these countries accelerate deploying production chains in the world. According to "World Investment Report 2011" published by UNCTAD, outward FDI from developing and transition economies reached a record \$388 billion in 2010 with the share in global outward FDI increasing from 16% in 2007 to 29% in 2010. In 2010, six developing and transition economies are among the world's top 20 investors in terms of outward FDI. World Investment Prospects Survey 2011-2013 (WIPS) published by UNCTAD confirmed that developing and transition economies are becoming important investors, and this trend is likely to continue to develop in the future.

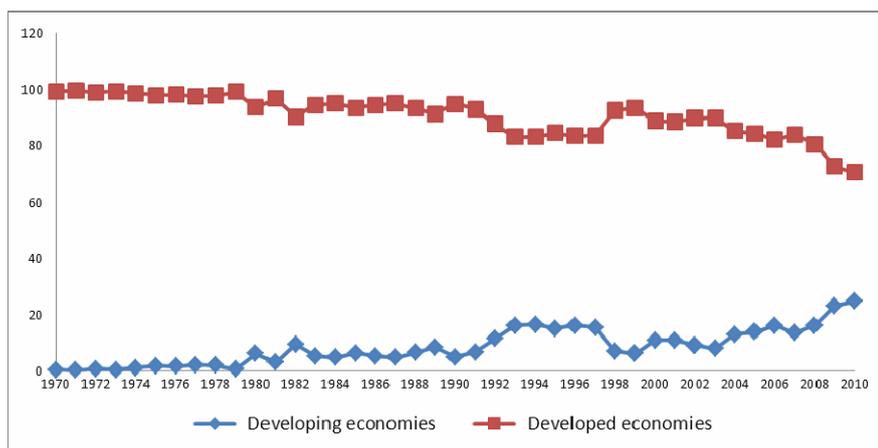
Global outward FDI increased by 11% in 2010, outward FDI from developed countries increased by 10%, and developing and transition economies by 21%. Among the major developed countries, FDI outflows from Europe and U.S. increased by 9.6% and 16% respectively, while FDI outflows from Japan dropped by 25% in 2010. Among developing and transition economies,

---

<sup>\*</sup> This report is supported by Nikkei Asia Scholarship. I am heartily thankful to Iwata Kazumasa, Kojima Akira, Kaneko Yutaka, Kabe Shigesaburo, Yamazaki Masaki, Kitahara Motohiko, Ushiyama Ryuichi, Yamada Go, Muroi Hidetaro, Takeuchi Fumihide, Iiduka Nobuo, Yamazawa Nariyasu and others whose guidance and discussion from the initial to the final level enabled me to deepen my understanding of the subject and promote my research. I am also extremely grateful to Nakajima Yukiko and Kikuchi Tamami whose assistant and help make me feel at home. Lastly, I offer my regards and blessings to my students in Chinese class who bring me a lot of pleasure and all of those who supported me in any respect during the period when I worked in Tokyo.

emerging economies from East Asia, South Asia, Southeast Asia and Latin America are main drivers; especially Hong Kong (China) and China mainland are the largest source of outward FDI which ranked fourth and fifth in the world in 2010. Outward FDI from both Hong Kong (China) and China mainland increased by more than \$100 billion, reached records \$760 billion and \$688 billion respectively in 2010. Outward FDI from transition economies increased by 24 percent reaching historical records \$ 61 billion, most of which came from Russia and Kazakhstan.

**The Percentage of Outward FDI from Developing Countries in Global Outward FDI**



Source: [www.unctad.org](http://www.unctad.org)

**FDI inflows to developing and transition economies, by region, average of 2005–2007 and 2008 to 2010 (Billions of dollars)**



Source: [www.unctad.org](http://www.unctad.org)

In terms of outward FDI projects, developing and transition economies were involved in seven mega-deals worth over \$3 billion accounting for 12 per cent of the total in 2010, while there are only two deals of this kind with the share 3 per cent in 2009. Especially with rapid economic growth and adequate financial resources, large-scale state-owned enterprises from Brazil, India, China and the Russian Federation (BRICs) acquired natural resources and strategic assets both within the regions and around the world. For example, in 2010, Indian mobile operator Bharti Airtel acquired telecoms operations of Kuwaiti Zain in 15 African countries at the price of \$10.7

---

billion in radiotelephone communications; Hong Kong Investor Group merged British EDF Energy PLC at the price of \$9.1 billion in Electric services; China Petrochemical Corporation (Sinopec Group) acquired Brazilian Repsol YPF Brasil SA at the price of \$7.1 billion in Crude petroleum and natural gas; Russian OAO “Vypel-Kommunikatsii” (Vimpelkom) purchased Ukrainian ZAO “Kyivstar GSM” at the price of \$5.5 billion in radiotelephone communications.

The geographical and industrial distributions of outward FDI from developing countries are different from traditional outward FDI. In order to gain ownership advantages to compete in fierce international markets, some firms from developing and transition economies intended to expand from value-added manufacturing to high value-added R&D, brand and distribution channels and so on. Especially during and after the global financial crisis, the developed countries have to conduct a new round of industrial restructuring; some developing countries also provide a series of preferential policies for overseas investment of domestic enterprises, which has created favorable conditions for forward and backward cross-border M&A. Under such circumstances, quite a few MNEs from developing and transition economies invest in industries where they didn't have comparative advantages and countries whose institutional quality and economic development levels are higher than parent countries apart from industries where they have comparative advantages in other developing countries. In term of entry modes of international market, cross board M&As are more likely adopted in developed countries, while Greenfield investments are more likely in developing and transition economies.

Some MNEs from East, South and Southeast Asia has invested not only in manufacturing, but also in tertiary industry in developed countries. Outward FDI in service industry from South, East and Southeast Asia mainly focus on real estate, hotels and tourism, telecommunications, transportation, financial services. In the past few years, although total outward FDI flows from those regions has declined slightly in service industry, while cross-border M&A has been increasing in professional services industry such as hotels, health services and telecommunications. At the same time, outward FDI flows in financial services have also been picked up, the value of deals in finance more than doubled to \$ 39 billion in 2010. In terms of entry modes of international investments, cross-border M&A accounts for about 70% of the cumulative outward FDI in service related to finance, warehousing, transportation and communications, business, wholesale and retail, and greenfield investments are less than 30% of total in service focusing on real estate, hotels and tourism, transport, communications and finance.

Developed countries are also preferred destination of cross-border M&A by MNEs from West Asia. According to "World Investment Report 2011" published by UNCTAD, cross-border M&A by West Asian firms in developed countries accounted for 68% of net purchases from 2004 to 2010, while greenfield investments in developing countries and transition economies covered 93% of the total by West Asian firms between 2003 and 2010. Outward FDI from West Asia not only flows into industries existing at home such as finance, hotel and petrochemicals to enhance capabilities, but also are involved in industries absent at home such as motor vehicles, aerospace, alternative energies and electronics to develop capabilities in developed countries and Asian emerging economies. Cross-border M&A in developed countries predominantly concerned chemicals and chemical products, motor vehicles, transport equipment, hotels and tourism, and telecommunications, electrical and electronic equipment in South, East and Southeast Asia. Greenfield investments mostly took place were related to real estate, hotels and tourism in developing and transition economies.

---

Tertiary industry was also preferred by outward FDI from West Asia. In terms of cross-border M&A, the share of tertiary industry including post and communications, transport, business services, hotels and restaurants and so on reached 50%; the percentage of secondary industry such as chemicals and chemical products, motor vehicles, transport equipment, electrical and electronic equipment were 39%; primary industry including mining, quarrying and petroleum only accounted for 11% of total amount. As for Greenfield investments, the share of tertiary industry including real estate, hotels and tourism, communications, transportation, leisure and entertainment stood at 75.3%; the percentage of secondary industry involving metals, chemicals, non-metallic minerals, food, beverages and tobacco, plastics was 14 %, Coal, oil and natural gas primary products of greenfield investments only accounted for 10.7% of total amount.

Outward FDI from Latin America and the Caribbean revealed the similar trend. MNEs from this region increased outward FDI during the global financial crisis. In this region, Brazil and Mexico were the most active countries in cross-border M&As. In 2010, 73% of cross-border M&As from this region were concentrated in developed countries, while and 75% of Greenfield investments from this region were mainly in developing and transition economies. According to "World Investment Report 2011" published by UNCTAD, most of Greenfield investments were located in Latin America and the Caribbean with the share of 78 per cent, 13% in South, East and South-East Asia, and 5% in Africa. For example, Brazilian companies such as Vale, Gerdau, Camargo Correa, Votorantim, Petrobras and Braskem have made acquisitions in the iron ore, steel, food, cement, chemical, and petroleum refining industries in developed countries. Mexican firms such as Grupo Televisa, Sigma Alimentos, Metalsa and Inmobiliaria Carso purchased firms in the United States in industries such as media, food, motor vehicles and services. There have been also some important intraregional acquisitions (table E), the most significant being the \$1.9 billion purchase by Grupo Aval (Colombia) of BAC Credomatic, a Panamanian affiliate of General Electric.

## **1.2 New Challenges Faced With Traditional FDI Theories**

The geographical and industrial distributions of outward FDI from developing and transition economies challenge traditional international economic theory. It is generally acknowledged in the literature that outward FDI should flow from countries with high level of economic development to countries with low level of economic development, and MNEs should have strong ownership advantages. However, some firms from developing and transition economies invest in industries where they have weak ownership advantages in developed countries. What's the rationale of outward FDI conducted by firms with weak ownership advantages from developing and transition economies? How to choose entry modes of international markets which mostly contribute to their survival and development? These problems are to be solved in international economics.

Notwithstanding the existing literatures on international economics deal with outward FDI from various perspectives, there is a lack of theoretical framework which can shed light on outward FDI both from developing countries and developed countries. On the one hand, some economists such as Hymer and Kindleberger(1960), Buckley and Casson(1976), Dunning(1977), Kojima(1978) and Antras(2004,2007,2009) deal with perfectly FDI from developed countries to developing countries; on the other hand, other economists such as Dunning(1981), Lall(1983), Wells(1983), Cantwell(1990), Lucas(1990), Tolentino(1993) , Reinhart and Rogoff (2004), Smaghi(2007) and Rajan(2008) explain the paradox that capital flows from developing countries to developed countries. But there has not been a unified theoretical framework which can explain

---

two-way flows of outward FDI among countries at different stages of economic development.

To firms which have not strong ownership advantages, the entry modes also affect their survival and development after going aboard. Faced with different economic and social environments of other countries, of all the firms investing overseas, some have been fairly successful by virtue of right production locations and entry modes, but others have suffered defeats due to improper strategies. So it is vital for these firms to choose a suitable production location among all other countries and a proper entry mode between M&A and green-field investment.

Based on above stylized facts, I will develop a theoretical model that combines the within-sectoral heterogeneity and institutional qualities of different countries. The model is similar to the theoretical model in Helpman et al. (2004), but allows for possibilities of M&A as an alternative to green-field FDI and different institutional quality. The recent literatures on heterogeneous firms assume a firm pays a fixed sunk cost to enter the industry, then it gains certain productivity, but they have not told us how to get the productivity. In this report, the productivity is given as a function of the fixed sunk cost and knowledge stock concerning the industry.

Like Antras(2004, 2007), the model also assumes a representative consumer preferences are expressed by a Cobb-Douglas function in a variety of differentiated goods. I make two assumptions about the comparative sizes of the various fixed organization costs. The fixed organization cost of green-field FDI is higher than that of M&A, reflecting that the price of the target firm is likely to be low relative to the costs of establishing new production facilities in a foreign country. We consider export and green-field investment as using a firm's own productivity, and treat M&A as using the productivity of the target firm.

## **2. Literature review**

Since 1950s, international economists have analyzed outward FDI from the perspectives of capital movement, product life cycle, a subsidiary with OLI advantages, industrial characteristics and global production networks. But all these FDI theories are insufficient to explain completely the geographical and industrial distributions of outward FDI from developing.

### **2.1 FDI as A Kind of Capital Movement**

Following the traditional theory of investment, this strand of literature thinks that FDI is a kind of production factor, and its movement across border is driven by the difference in the expected rates of return on capital. This view represented by Mundell (1957) and MacDougall (1960), predicted that FDI would flow from capital abundant countries where capital was relative cheap to capital scarce countries where capital was relative expensive. In the 1960s and 1970s, some economists further expanded this theoretical strand by introducing portfolio theory. Taking expected rates of return on capital and investment risks into account together, they predicted a positive relation of FDI with respect to the rate of return and a negative one with respect to risk, and argued that a firm could reduce the total risk involved by investing in more than one country (Agarwal, 1980).

Since FDI is a kind of production factor, the product related factors should also directly and indirectly affect FDI movement. In this sense, the viewpoint of FDI as capital movement is somewhat incomplete. Furthermore, the above theory can't explain China's puzzle: the expected rate of return on capital has remained about 20 percent in China, higher than in most industrialized

---

and developing economies, and China is the largest recipient of FDI in the developing world; on the other hand, China's OFDI has also gained its momentum in recent years.

## **2.2 FDI as A Response to Product Life Cycle**

Based on the expansion of the U.S. MNEs after World War II, product life-cycle theory (Vernon, 1966) explained FDI from the perspective of dynamic comparative advantage in the production of a product. The theory suggests that most products chronologically in turn experience five stages including introduction, growth, maturity, saturation and decline. Along product life cycle, the country that has the comparative advantage in the production of the product changes from the innovating country to other developed countries and then to developing countries. The location of production and FDI movement depend crucially on which stage the product is at and whether a country has the corresponding comparative advantage. For example, at the first stage the product is invented by a firm in the U.S., and at the following 4 stages the firm will in turn establish foreign subsidiaries in Europe and developing countries if conditions are favorable.

As Vernon (1979) recognized that product life-cycle theory had considerably weakened its predictive power with the change in international production circumstances. Especially when the international division of labor takes place intra-product along global production chain, many countries at different stages of economic development can take part in the production of the same product at the start, and FDI may appear at the first stage of product life cycle. In this regard, a new listing Nokia mobile phone is a case in point.

## **2.3 FDI as a Subsidiary with OLI Advantages**

Compared with securities investment, FDI is more related to a unique bundle of factors, competencies and procedures which a firm possesses in order to produce goods or services abroad. The unique bundle of factors, competencies has two different implications for the firm. On the one hand, they endow the firm monopolistic competitive advantages which overcome the disadvantages of operation abroad, which is so called ownership advantage; on the other hand, they are highly asset-specific or tacit, contract friction, uncertainty and opportunism may erode competitive advantages, so the firm would internalize the unique resources and competencies rather than sell or license them to other independent firms, which is so called internalization advantage.

Why does a firm choose FDI instead of export under ownership advantage and internalization advantage? The host country has some advantages compared to the home country such as cheaper factors and natural resources, a prosperous market, lower taxes or tariffs, which is so called location advantage. In a word, a firm establishes a new plant abroad in order to develop a new competitive advantage by synthesizing its ownership advantages with location advantages of host countries and lowering transaction costs within its boundary, which is so called OLI eclectic paradigm.

Investment development path (IDP) theorem predicts whether or not a developing country can start its outward FDI depends on whether its firms have generated sufficient ownership advantages to overcome the initial barriers to foreign production, and according to the country's economic development, investment development from IFDI to OFDI will follow such five stages as little IFDI, rising IFDI, decreasing IFDI, OFDI larger than IFDI, and net investment position fluctuating around zero.

The OLI eclectic paradigm well explains FDI from developed countries to developing economies, many economists (Lecraw, 1977; Lall, 1983a; Wells, 1983; Riemens, 1989; Tolentino,

---

1993; Dunning et al., 1997; Yeung, 1998) also applied OLI framework to FDI among developing countries. Following Dunning's eclectic paradigm, early literatures hold that MNEs from developing countries own special advantages which are the same as that of congeners from developed countries in nature but different in form or source. In general, many developing countries are at the same stage of economic development and reveal similarities in factor endowment, production technology, market size, institutional environments, and ethnic characters and so on. By virtue of these similarities, MNEs from developing countries adapt to local environments which save significant entry costs and give them advantages over competitors from developed countries. Although the above literatures deal with outward FDI with strong ownership advantage, they can't interpret the two-way FDI flows between developed countries and developing economies as firms from the latter have less ownership advantage than those from the former. Especially since the early 1990s, more and more firms with very limited ownership advantages from emerging economies have invested in tertiary industry of developed countries which challenges OLI eclectic paradigm.

#### **2.4 FDI as a Reflection of Industrial Characteristics**

The OLI eclectic paradigm mainly focuses on firm-specific advantages relative to foreign rivals in order to overcome disadvantages faced by MNEs in the host country. However, as a firm always operates in a certain industry, and industrial characteristics are often closely related to ownership and location advantages possessed by the firm, therefor affect the direction of outward FDI and entry modes of international markets. It is from the perspective of industry characteristics that economists explore the fragmentation of production across borders and distinguish between vertical and horizontal MNEs. Vertical MNEs are those locating different inputs or stages of the production process in multiple countries in order to exploit differences in factor prices among countries. Horizontal MNEs are those producing roughly the same product in multiple countries with an intention to get an access to the host market.

The theory of marginal industrial expansion proposed by Kojima (1978) emphasizes the effect of the relative advantages and potentials of the industry between investing and host country on outward FDI. Based on Japanese multinational business operations, Kojima (1978) argues that outward FDI should begin with the industries which have lost or will lose comparative advantages in parent country and flow to host countries where these industries have potential comparative advantages, and the realization of potential comparative advantages and the transfer of marginal industry contribute to the welfare of both host country and parent country by optimization of resources. The theory on marginal industrial expansion well explains the outward FDI in terms of comparative advantages, but it attaches less importance on other industrial characteristics such as imperfect competition, economies of scale and product differentiation

In the industry with monopolistic competition and differentiated products, firms have an incentive to separate capital intensive inputs from the labor intensive components and produce them respectively in different countries according to relative factor endowments. In the industry characterized by monopolistic competition and economies of scale, if a firm decides to get access to markets of other countries which are at the same development stage as home country, it will be faced with a proximity-concentration trade-off. In other words, the firm can choose between FDI and export, the former economizes on transportation and tariff costs, while the latter saves on fixed costs of duplicating production capacity abroad (Caves, 2007). In the end, the foreign market entry mode of the firm depends on the relative size of gains from avoiding trade costs to the costs

---

of setting up plants abroad.

Based on the fragmentation that knowledge-intensive activities can be geographically separated from production and supplied to production facilities at low cost, knowledge-capital model analyzes simultaneously vertical and horizontal MNEs. The characteristics that knowledge-intensive activities are skilled-labor intensive relative to production give rise to vertical multinationals which fragment production and locate activities according to factor prices and market size, and the characteristics that knowledge-intensive activities are partially non-exclusive gives rise to horizontal multinationals which produce the same goods or services in multiple locations.

It is difficult for above mentioned theories to analyze the inverse outward FDI from developing countries which have less comparative advantages in developed countries. Outward FDI from developing countries maybe derive from special industrial characters of developing countries. Generally speaking, in most developing countries, industries are characterized by small market size and mature or universal products which require labor intensive and flexible process, low specialization and high universality of machinery and equipment, and therefor adaptation and localization of foreign technology in accordance with market and production conditions of developing countries. Such special industrial characters provide MNEs from developing economies an edge over western MNEs characterized by sophisticated technologies, specialization of production and economies of size, and drive outward FDI flows among developing countries.

As the above theories neglect firm-level diversity in the industry, they can't well explain why firms choose different entry modes of international market under the identical industrial characteristics. The literature of heterogeneous firms highlights the effect of difference in productivity on the entry modes of foreign market. Helpman, Melitz and Yeaple (2004) show the least productive firm exits or serves the domestic market; the firm whose productivity is higher than that necessary to survive in the domestic market can export, while the most productive firm will choose horizontal FDI. Kendall and Ryan (2007) further explore the effect of productivity on entry modes of FDI taking into account the extent to which the technology is transferable, and find the most productive firm will enter foreign markets through green-field investment if the technology is partly transferable, and M&A if the technology is perfectly transferable. Nocke and Yeaple (2007) suggest that characteristics of firms choosing various entry modes of foreign market and the variation of international production organization across industries and country-pairs depend on the nature of firm heterogeneity, and cross border mergers involve the most or the least efficient active firms contingent on whether firms differ in their mobile or immobile capabilities.

Corresponding to heterogeneity in productivity, the fixed organization cost is another important factor affecting entry modes of foreign market. Raff, Ryan and Stähler (2009) shows that the profitability of green-field investment determines the outside option of potential acquisition targets and joint venture partners, a joint venture is preferred to M&A, and M&A to green-field investment if the fixed costs of M&A and joint venture are sufficiently low. Qiu (2010) develops a model with distribution costs to study firm cooperation under different types of foreign market entry modes, and finds cross-border alliances and mergers are independence if and only if distribution cost is high under both export and FDI, cross-border alliances are chosen in equilibrium if distribution cost is high under export, and cross-border alliances (mergers) are chosen in equilibrium if plant setup cost is low (high) under FDI and with high distribution cost.

---

## **2.5 FDI as a Linkage to Global Production Networks**

With the deepening of international division of labor, more and more firms from emerging economies have been involved in global production networks, and inward internationalization and external linkages are important driving factors of outward FDI. Ozawa (1992) argues that outward FDI from developing countries results from the changing pattern of dynamic comparative advantage caused by inward foreign direct investment, increasing factor incongruity, and localized learning and technological accumulation. Cavusgil and Naor(1987), Korhonen *et al*(1994), Child and Rodrigues(2005) show inward transfer of knowledge, technology, expertise, and managerial know-how through inward FDI, import and export can subsequently lay the foundation for outward internationalization.

In contrast to MNEs from developed countries, many MNEs from developing countries don't focus on their innate ownership advantages, but on advantages that can be acquired through linkages with the external environment. LLL (linkages-leveraging-learning) paradigm proposed by Mathews (2006) argues MNEs from emerging economies invest overseas in order to establish linkages with the external environments, leverage their resources through such linkages, and learn how to facilitate both linkages and leveraging of resources. As the performance of OFDI might be contingent on their ability to develop linkages and leverage resources, they are often supported by governments at the early stages. LLL paradigm explains how to enhance firms' ownership advantages from the prospective of external linkages, but it has not interpreted explicitly why these firms develop linkages and leverage resources in foreign countries (especially in developed countries) instead of at home.

## **3. Re-thinking Heterogeneity in Productivity**

The prevalent theory of heterogeneous firms explains well entry modes of international market from the perspective of productivity, but there are there are discrepancies between theoretical assumptions and business practice, and the sources of this heterogeneity are still a black box.

### **3.1 Theoretical Assumptions in Literature on Heterogeneity**

Higher productivity of multinational firms and exporters has been widely documented in the literature. The literature on firm heterogeneity usually assumes the productivity is a random and exogenous draw from a Pareto distribution after paying fixed entry costs. Based on above assumption, Helpman et al. (2004) demonstrates that firms choose corresponding international market entry modes according to their productivity, the least productive firms exit from the industry, low-productivity firms serve only the domestic market, the remaining firms serve the domestic market as well as foreign markets of which more productive firms can enter international markets by export and the most productive firms by FDI.

### **3.2 The Discrepancy between Theoretical Assumptions and Real Practice**

In reality, survival and selection depend more on profitability than productivity. Furthermore, this strand of literature usually assumes that the productivity is a random and exogenous draw from a Pareto distribution after paying entry costs, but in practice productivity is often a comprehensive result of factors at firm level, industry level and country level except for sunk cost.

However, the sources of this heterogeneity are still a black box. With the same entry costs, why different potential entrants are assigned to variable productivity? Even business practice goes in the opposite direction. For example, EMNCs with lower productivity also serve international

---

markets by export or FDI in recent years; even they have merged and acquired firms with higher productivity in developed countries. The way fixed entry costs affect firms' productivity and the relationship between internalization and productivity remain an open question in the literature.

The literature of heterogeneous firms usually assumes that Pareto distribution of productivity in the same industry is identified, but some empirical literature documents that there is the Pareto distribution of productivity is also heterogeneous among countries at different levels of economic development and even at the same level of economic development. Jones (2008) shows large income & TFP differences among countries. Damsgaard and Krusell(2010) suggest the world distribution of productivity is characterized by "twin peaks" or uni-modality with large dispersion in the long term even under the assumption that all countries are ex-ante identical.

In addition, the productivity distribution in the same industry among different countries is also heterogeneous in nature. Acemoglu and Zilibotti (2001) find that there is a considerable productivity gap in almost all the industries among LDCs and OECD in terms of mismatch between the requirements of technologies and the skills of LDC workers. Hsieh and Klenow (2009) demonstrate sizable productivity gaps within manufacturing in China and India Compared to the U.S. from the perspective of resource misallocation, and suggest manufacturing TFP will grow 30-50% in China and 40-60% in India when capital and labor are hypothetically reallocated to equalize marginal products to the extent observed in the U.S.

## **4. Entry Cost and Productivity**

Entry costs broadly include the transaction cost concerning the establishment of the firm before entering the industry and the investments asset-specific investments related to product differentiation. Both the size and structure of entry costs can affect firm's productivity which means the potential entrant can exert influence on its own productivity instead of exogenous draw from Pareto distribution of productivity.

### **4.1 The Contents of Entry Costs**

As we all know, the potential entrant will spend much money, time and energy in preparing for the establishment of the firm before entering the industry. It will launch an investigation not only on consumer preferences, purchasing and other concerning data on which the choice of target market is based, but also on the advantages and weaknesses in quality and function of similar products or services. Apart from studying relevant industrial standards and related policies, sometimes it may retain accounting and law firms to deal with documents required by concerning authorities. At the same time, it is a prerequisite for business operation to build an excellent management team and recruit good workers, formulate strategic planning, transport goods, make advertisements, develop distribution channels and provide after-sale services. The above investments in most of above activities are transaction- specific and sunk cost.

Asset-specific investments related to product differentiation are also an important part of entry cost. In response to fierce market competition and the diversification of consumer demand, product differentiation strategy is widely used by potential market entrants. In the implementation of the above strategy, the potential entrant may buy special equipment and conduct R&D including product or process innovation. In addition, if the potential entrant is intended to take part in global production networks, it will make corresponding asset-specific investments in order to produce customized (not standardized) intermediate products for upstream and downstream enterprises. And the investments for customized intermediate products are usually both

---

relationship-specific asset and sunk cost.

#### **4.2 The Effects of Entry Costs on Productivity**

The size of minimum entry costs required by the industry is negatively correlated with productivity threshold for survival, while the size of fixed organization costs goes in the opposite direction. Higher sunk entry costs provide barriers which prevent potential entrants from competing, and allow incumbent inefficient firms to survive. Hopenhayn (1992) demonstrates that higher sunk entry costs reduce the intensity of market competition, therefore lower the minimum productivity threshold in the industry. Syverson (2004b) argues higher fixed organization costs make it more difficult for inefficient producers to be profitable, so sunk entry costs and fixed organization costs together impinge on the critical productivity cutoff level, and therefore on the dynamics of the industry productivity distribution.

The structure of entry costs may be different in the same industry. As stated above, entry costs which are sunk in nature can be broadly divided into two categories, one is relevant to transaction costs and the other is asset-specific investments related to product differentiation and participation in global production networks. Even the size of entry costs is fixed; the structure of entry costs may be different. For example, within the same industry, some potential entrants own superior organizational capital, some invest much money in human capital or sophisticated equipment; others maybe attach importance to external linkages to global production networks.

The difference in the structure of entry costs may be the resource of heterogeneity in productivity. Bresnahan et al. (2002) show organizational capital including all types of intangible assets embodied in an organization has positive effects on productivity. Bloom et al. (2007) claim measures of managerial practice are strongly correlated with firm-level productivity, profitability, Tobin's Q, and survival rates. Bloom et al. (2010) argue that US multinationals obtained higher productivity from IT than non-US multinationals in Europe and owe this pattern to the US firms' organization which allows them to apply new technologies more efficiently. US firms' organization allows them to apply new technologies more efficiently. Katsuya(2011) suggest the positive feedback mechanism between organization capital and skilled workers explains a major part of the observed persistence and disparity in productivity.

Those potential entrants with the intention to internalize often actively gained high productivity by export or FDI-specific investments instead of a passive and exogenous draw. Schmitz (2005) also finds potential entrants in the international markets are more likely to adopt new technologies than firms having a monopoly power at home. In a model where born identical firms have the possibility to adopt either a high technology with low unit cost and high fixed cost of technology adoption or low technology with high unit cost and low fixed cost of technology adoption, Yeaple (2005) predicts only the former will be able to export in the presence of fixed organization cost to enter international market. Castellani and Giovannetti(2009) suggests that heterogeneity across firms with different international exposure depends on how firms choose their production function and how productive individual inputs are by considering the possibility of different slopes of the production function.

Apart from firm-specific investments by itself, external linkages are also an important way to enhance productivity of the potential entrant under global production networks. The upstream and downstream can achieve static synergies to reduce entry costs by sharing management resources, marketing and distribution networks; and dynamic synergies to enhance a firm's innovatory capabilities by matching of complementary capability and resources. L-L-L(linkage, leverage, and

---

learning) paradigm developed by Matthews (2006) means potential entrants can establish global linkages to leverage their existing firm-specific investments , and learn how to enhance their productivity by static or dynamic synergies.

## **5. Institution and Productivity**

Although the size and structure of entry costs can affect the productivity of potential entrants, it seems difficult to account for all the differences in distribution of productivity among countries. Literatures on productivity deal with the issue from the perspective of institution environments. The institutions influence the productivity of both firms within the country and the country itself.

### **5.1 Institution Environments**

As a firm is always located in specific social and institutional contexts, some literatures deal with this issue from the perspective of institutional economics. Just as Oliver (1997) describes, “firms operate within a social framework of norms, values and taken-for-granted assumptions about what constitutes appropriate or acceptable economical behavior”. So the firm’s productivity is not only dependent on entry costs, but also affected by social norms and government policies. Oliver (1997) further expresses: “Unlike economic and strategic frameworks, which examine the extent to which firm behavior is rational and economically justified, institutional theorists emphasize the extent to which firm behavior is compliant, habitual, unreflective, and socially defined”.

Different from neoclassical economics focusing on the actions and transactions, institutional economics stresses the environments where actions and transactions take place. North (1991 p.97) emphasizes humanly devised constraints that structure political, economic and social interaction, and calls these constraints institutions. North (1991) further classifies constraints into formal rules and informal restraints. Formal rules include constitutions, laws and property rights which influence interaction by forming a framework in which economic transactions can take place; and informal restraints are involved in norms, values, sanctions, taboos, customs, traditions and code of conduct. Both formal and informal rules contribute to the perpetuation of order and safety within a market or society.

The institutional quality influences the economic performance of both firms within the country and the country itself heavily. North (1990) argues that it is ultimately a friendly environment and policies that lead to economic prosperity. Especially, institution-induced productivity may be different under varying circumstances. Rodrik and Subramanian(2003) suggest what actually matters are the rules of the game such as prevailing explicit and implicit behavioral norms in a society and the ability to create appropriate incentives for desirable economic behavior. Based on World Bank Investment Climate Surveys (2003), Bastos and Nasir (2004) demonstrate that the persistence of productivity differences among countries may result largely from differences in the investment climate, and secure properties rights, efficient government services and developed infrastructure help not only reduce uncertainty and transaction costs but also raise returns to investment.

### **5.2 The Effects of Institutions on Productivity**

Institutions influence firms at different levels by setting the framework in which economic activities take place. At firm level, informal rules such as values, taboos and traditions can influence the manager’s decision on the structure of entry cost. At industry and country level, social structure, law system, market system and innovation system and so on affect the

---

productivity of a country from various aspects.

Infrastructure can be subdivided into physical structure and social structure, the former includes power, water, highways, and IT and so on, the latter that is institution-related comprises education system, innovation system, and law system and otherwise. High quality of infrastructure contributes to lowering productivity costs, transportation costs and transaction costs, therefore improves industrial productivity. Aschauer (1993) asserts public infrastructure to be a factor of production, and the declining of the public capital stock from 46.1% of GNP in 1960 to less than 41% of GNP in 1990 may be responsible for a very substantial portion of the productivity slowdown and cross-country differences in productivity growth.

The quality of educational systems positively affects industrial productivity. As R&D can promote product or process innovation and enhance absorptive capacity of advanced technology, potential entrants need invest relevant physical capital and human capital in R&D in order to improve the capability of technological innovation and the level of productivity. Guellec and van Pottelsberghe (2001) find R&D in government and higher education sectors, the intensity of the business R&D effort and the openness of their country to foreign technology have positive and statistically significant positive effects on productivity in the case of OECD over the period 1980-98. Especially, R&D is greatly dependent on the quality of educational systems; higher-level teaching and research are the main source of new knowledge, secondary-level and higher education in engineering and scientific areas is necessary for product and process innovation.

Furthermore, as knowledge is a kind of public goods, the inputs and outputs of R&D may be lower than the social optimal level. The government should provide subsidies for basic R&D and promote R&D collaborations among firms, universities and public research institutes along production chains. Under such circumstances, an effective innovation system is critical to productivity growth. Chen and Dahlman (2004) suggest innovation system refers to the network of institutions which are composed of universities, public and private research centers and policy think tanks and so on, rules and procedures that influences the way by which a country acquires, creates, disseminates and uses knowledge, and further advise that a key element of a developing country's innovation strategy is to find the best ways to tap into the growing global knowledge base and to decide where and how to deploy its domestic R&D capability. Nishimura and Okamuro(2010) suggest that it is important to develop wide-range collaborative networks within and beyond the clusters in order to improve the R&D efficiency, and industrial cluster participants can apply for more patents than others without reducing patent quality when they collaborate with universities in the cluster region based on 229 R&D-intensive SMEs.

To have the incentive to conduct R&D, a firm must be able to appropriate returns sufficient to make related investments worthwhile. In general, property right is exclusively possessed by owners of assets, and the definition of property right is the premise on which economic transaction is based. Levine (2005) suggests that the security of property rights embodies in the facilitation of private contracting, the fairness of the law and rule to everyone and sufficient constraints of government from coercion and informal payments. The extent to which intelligent property of rights and asset-specific investments owned by business and public sectors are protected directly affects the intensity and scope of R&D investments in both tangible and intangible assets, and thereby the revenue of potential entrants at the post-R&D stage.

Especially it is a very important way to promote innovation in some developing countries where legal system and social credit system have not developed. North (1990) regards property

---

and contract rights as key to channeling resources toward productive investments, and owes historical stagnation and contemporary underdevelopment in the Third World to shortage of effective, low-cost enforcement of contracts. Diwan and Rodrik (1991) and Taylor (1994) theoretically reveal that stronger IPRs may enhance global welfare and productivity. Sherwood (1990) and Korenko (1999) prove this viewpoint based on case studies in some developing countries and Italy's pharmaceutical industry respectively. In addition, Levin, Klevorick, Nelson and Winter (1987) finds patent protection is not the most important means for firms to appropriate the returns to their R&D, but it can be used to acquire strategic bargaining chips for cross licensing negotiations in the case of U.S. firms. Chen and Puttitanum (2005) provide evidence that broad property rights including IPR protection promote R&D investments. Lin and Song(2009) find that property rights protection is positively and significantly related to corporate R&D activity as well as with R&D output including process and product innovations based on 2003 World Bank survey.

Generally speaking, there is high quality of education, sound market systems and innovation system in developed countries, which contributes to the production of technical knowledge in the world. However, in some developing countries, the shortage of well-educated labors and unsound capital market constrain R&D activities especially weak protection of intelligent property right restricts the incentive to invest in R&D. Therefore, whether a country can develop policies and regulations which promote considerably R&D will directly affect the level of firms' innovative capacity.

## 6. The Model

Based on above analysis, I will develop a theoretical model that combines the within-sectoral heterogeneity and institutional qualities of different countries. The model not only analyzes the entry mode choice of FDI under different scenarios, but also explains born global firms and two-way FDI flows among countries at different stage of economic development from the perspective of institutional quality.

### 6.1 Theoretical Assumptions

Consider a world with two countries, the Domestic and the Foreign, and a unique factor of production, labor. The world is populated by a unit measure of consumers with identical preferences represented by

$$X_j = \left[ \int_{i \in \Omega_i} q(i)^{\alpha_i} di \right]^{\frac{\beta}{\alpha_i}} q_0^{1-\beta}, \quad \alpha_i = \frac{\sigma_i - 1}{\sigma_i}, \quad \sigma_i > 1$$

Where  $q(i)$  is the consumption of variety of differentiated product  $i$ ,  $q_0$  is the consumption of a homogeneous good. Aggregate consumption in differentiated product is a constant elasticity of substitution function, and the elasticity of substitution between any two different varieties is  $\sigma_i$ .

According to characteristics of C-D production function,  $\beta$  is the fraction of expenditure on differentiated products in total income  $E_l, l \in (d, f)$ .

---

Based on the utility function and budget constraint

$$\max \left[ \int_{i \in \Omega_i} q(i)^{\alpha_i} di \right]^{\frac{1}{\alpha_i}}$$

$$\text{St. } \sum_{v=1}^n p(i)q(i) = \beta E$$

We get the inverse demand function for each variety  $i$

$$q(i) = \frac{\beta E p_i^{-\sigma_i}}{P^{1-\sigma_i}}$$

Here  $P = \left[ \int_{i \in \Omega_i} p(i)^{1-\sigma_i} di \right]^{\frac{1}{1-\sigma_i}}$  is the total price index.

At national level, firms can produce differentiated products domestically ( $d$ ) or in foreign countries ( $f$ ) and these two production locations are different in wage rate and institutional quality are different. In each country, producers of differentiated products face a perfectly elastic supply of labor and constant institutional quality. We denote by  $w_l$ ,  $l \in (d, f)$  and

$\gamma_l$ ,  $l \in (d, f)$  the wage rate and institutional quality respectively, so  $w = \frac{w_f}{w_d}$  and

$\gamma = \frac{\gamma_f}{\gamma_d}$  are foreign relative wage and relative institutional quality respectively.

The stock of knowledge is another important factor related to productivity at national level. According to Leamer and Storper (2001), there are two types of knowledge; one is codifiable knowledge which can be expressed in a symbol system and flow freely across boards, and the other is tacit or noncodifiable knowledge which can be gained by communicating in face-to-face interchange or embedding in certain environments and is difficult to be transferred among countries. As the stock of knowledge on which the firm's research productivity depends greatly may be different among the two production location and the world is far from flat, it is necessary

to distinguish between  $A_d$  and  $A_f$ . We define the foreign relative stock of knowledge as  $A = \frac{A_f}{A_d}$ .

At industrial level, following the assumption by Melitz (2003) and Antras (2004, 2007), the potential entrant must pay fixed entry cost  $f_e$  which is sunk in nature. Just as analyzed before, although the fixed entry cost  $f_e$  is the resource of productivity, the productive effect of payments on the establishment of the firm which are transaction costs and investments related to product differentiation which are relation specific is directly dependent on institutional quality  $\gamma_l$ .

The market systems, innovation system, education systems and the protection of property right not only affect incentive and ability to conduct R&D, but also influence the structure of the fixed entry costs.

Apart from the fixed entry cost, firms entail fixed organizational costs of  $f_x$ ,  $f_m$  or  $f_g$  corresponding to export, M&A or green-field investment respectively. We assume that the fixed organizational costs are ranked as follows:  $f_x < f_m < f_g$ . In addition, if firms choose exports, they need to pay transport costs of the iceberg type, that is to say, if the firm exports one unit product, it must deliver  $\tau > 1$  units of products,  $\tau - 1$  units of the delivered good “melts away” in transit because of trade cost.

At firm level, firm-specific capability  $\delta$  causes the variance in productivity of firms in the identical industry and country with equal institutional quality. Firm-specific capability is involved in various aspects such as entrepreneur ability, firm’s strategy and relationship assets, the ability to adapt to institutions in host country. Entrepreneur ability and firm’s strategy exert influence on the structure of the fixed entry cost, and further affect the productivity of firms. Relationship assets and the ability to adapt to institutions in host country may promote the static and dynamic synergies among upstream and downstream firms along production chains.

Based on above analysis, the potential productivity drawn by the firm before entering the industry can be expressed as

$$\theta = \delta_l f_e^{\gamma_l} A_l^\phi, \quad l \in (d, f)$$

where  $\delta$ ,  $\phi$  and  $\gamma_l$ ,  $l \in (d, f)$  are constant parameters. The boundary of institutional quality is  $0 < \gamma_l < 1$ , and larger  $\gamma_l$  means higher institutional quality. Taking into account “standing on shoulders” effect and “fishing out” effects, we assume  $0 < \phi < 1$  which means the former dominates the latter.

In terms of specific entry modes of international market, we assume the firm takes advantage of its own productivity in forms of export and green-field investment, and the merged firm’s productivity in forms of cross board M&A. If the firm conduct cross board M&A, there are difficulties in integration of the two firms from different countries, and  $z$  represents matching frictions between investing firm and the merged firm.

Taking into account specific characteristics in different entry mode of international market, we obtain productivity in terms of export, cross board M&A and green-field investment.

$$\theta_x = \delta_d f_e^{r_d} A_d^\phi;$$

$$\theta_m = z \delta_f f_e^{r_f} A_f^\phi;$$

$$\theta_g = \delta_d f_e^{r_f} A_d^\phi.$$

As labor is the sole input, the marginal cost of M&A and green-field investment is  $c = \frac{w_f}{\theta}$ ,

and the marginal cost of export is  $c = \frac{\tau w_d}{\theta}$ . The price of differentiated product  $i$  is  $p_i = \frac{w_f}{\alpha_i \theta}$

when firms conduct outward FDI in forms of M&A and green-field investment, and  $p_i = \frac{\tau w_d}{\alpha_i \theta}$

in forms of export.

With the demand function and the marginal cost of differentiated products, we get the general profit function:

$$\begin{aligned}\pi &= p_i q_i - MC q_i = (1 - \alpha_i) p_i q_i \\ &= \frac{1}{\sigma_i} \frac{\beta E (p_i)^{1-\sigma_i}}{P^{1-\sigma_i}} \\ &= \frac{\beta E P^{\sigma_i-1}}{\sigma_i \alpha_i^{1-\sigma_i}} \left(\frac{\theta}{w_i}\right)^{\sigma_i-1} \\ &= M \left(\frac{\theta}{w_i}\right)^{\sigma_i-1},\end{aligned}$$

Where  $M = \frac{\beta E P^{\sigma_i-1}}{\sigma_i \alpha_i^{1-\sigma_i}}$  represents residual demand of differentiated products.

Profit functions in forms of export, M&A and green-field can be further expressed as

$$\Pi_x = M \left[ \frac{\delta_d f_e^{r_d} A_d^\phi}{w_d \tau} \right]^{\sigma_i-1} - w_f (f_e + f_x)$$

$$\Pi_m = M \left[ \frac{z \delta_f f_e^{r_f} A_f^\phi}{w_f} \right]^{\sigma_i-1} - w_f (f_e + f_m)$$

$$\Pi_g = M \left[ \frac{\delta_d f_e^{r_d} A_d^\phi}{w_f} \right]^{\sigma_i-1} - w_f (f_e + f_g)$$

According to above profit function, we obtain the thresholds of institutional quality in terms of export, cross board M&A, green-field investment respectively.

$$f_e^{r_x(\sigma_i-1)} = \frac{w_f (f_e + f_x)}{M \left[ \frac{\delta_d A_d^\phi}{w_d \tau} \right]^{\sigma_i-1}}$$

$$f_e^{r_m(\sigma_{i-1})} = \frac{w_f(f_e + f_m)}{M\left[\frac{z\delta_f A_f^\phi}{w_f}\right]^{\sigma_{i-1}}}$$

$$f_e^{r_g(\sigma_{i-1})} = \frac{w_f(f_e + f_g)}{M\left[\frac{\delta_d A_d^\phi}{w_f}\right]^{\sigma_{i-1}}}$$

Similarly, we can get critical point where the profit of export is equal to that of cross board M&A, the critical point where the profit of export is equal to that of green-field investment, and the critical point where the profit of cross board M&A is equal to that of green-field investment.

$$f_e^{r_{xm}(\sigma_{i-1})} = \frac{w_f(f_m - f_x)}{M\left[\left(\frac{z\delta_f A_f^\phi}{w_f}\right)^{\sigma_{i-1}} - \left(\frac{\delta_d A_d^\phi}{w_d\tau}\right)^{\sigma_{i-1}}\right]}$$

$$f_e^{r_{xg}(\sigma_{i-1})} = \frac{w_f(f_g - f_x)}{M\left[\left(\frac{\delta_d A_d^\phi}{w_f}\right)^{\sigma_{i-1}} - \left(\frac{\delta_d A_d^\phi}{w_d\tau}\right)^{\sigma_{i-1}}\right]}$$

$$f_e^{r_{mg}(\sigma_{i-1})} = \frac{w_f(f_g - f_m)}{M\left[\left(\frac{\delta_d A_d^\phi}{w_f}\right)^{\sigma_{i-1}} - \left(\frac{z\delta_f A_f^\phi}{w_f}\right)^{\sigma_{i-1}}\right]}$$

## 6.2 Entry Modes under Different Scenarios

Comparing foreign relative capability to create productivity with comprehensive relative cost, we can classify the direction of outward FDI into six scenarios. Generally speaking, developing countries have lower comprehensive relative cost and capability to create productivity. Scenario 1 and 2 correspond to outward FDI from developed countries to developing countries. Similarly, Scenario 4 and 5 correspond to outward FDI from developing countries to developed countries. Scenario 3 and 6 are somewhat special, they broadly correspond to outward FDI from less developed countries to emerging economy such as China and reverse outward FDI between them. In addition, under each scenario, we further subdivide entry modes into several situations according to relative fixed cost of different organization forms.

**Scenario 1:**  $\frac{w}{\tau} < z\delta A^\phi < 1$

Under this scenario, the host country has lower relative capability to create productivity in terms of cross board M&A than parent country ( $z\delta A^\phi < 1$ ), and foreign factor cost is also lower than domestic factor cost multiplied by transport cost ( $\frac{w}{\tau} < 1$ ). Foreign disadvantage in capability to create productivity exceeds foreign advantage in factor cost.

When the fixed organization costs of export, cross board M&A, green-field investment

satisfy  $\frac{f_e + f_x}{\left(\frac{w}{\tau}\right)^{\sigma_i-1}} < \frac{f_e + f_m}{(z\delta A^\phi)^{\sigma_i-1}} < \frac{f_m - f_x}{(z\delta A^\phi)^{\sigma_i-1} - \left(\frac{w}{\tau}\right)^{\sigma_i-1}} < \frac{f_g - f_m}{1 - (z\delta A^\phi)^{\sigma_i-1}}$  , we can illuminate

entry mode choice of international market in figure 1.

If  $r_f < r_d < r_x$  or  $r_d < r_f$  ,  $r_d < r_x$  and  $r_f < r_m$  , the firm exits from domestic market;  
if  $r_x < r_f < r_d < r_{xm}$  , export is the best entry mode of international market; if  $r_d < r_f$  ,  
 $r_m < r_f < r_{xm}$  and  $r_d < r_x$  , or if  $r_{xm} < r_d < r_f < r_{mg}$  , cross board M&A is the best entry mode of  
international market; if  $r_{mg} < r_d < r_f$  , green-field investment is the best entry mode of international  
market.

If  $r_x < r_d < r_f < r_{xm}$  or  $r_{xm} < r_f < r_d < r_{mg}$  , when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} =$   
 $\frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M\left(\frac{z\delta_f A_f^\phi \tau}{w}\right)^{\sigma_i-1}}$  , it is indifferent between export and cross board

M&A; when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} > \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M\left(\frac{z\delta_f A_f^\phi \tau}{w}\right)^{\sigma_i-1}}$  , cross board

M&A is the best entry mode of international market ; when  $r_d$  and  $r_f$  satisfy

$f_e^{r_f(\sigma-1)} < \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M\left(\frac{z\delta_f A_f^\phi \tau}{w}\right)^{\sigma_i-1}}$  , export is the best entry mode of

international market.

If  $r_{mg} < r_f < r_d$  , when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} = \frac{w_f^\sigma(f_g - f_x)(w_d\tau)^{\sigma-1}}{M\left(\frac{\delta_d A_d^\phi}{w}\right)^{\sigma_i-1}} + \left(\frac{w}{\tau} f_e^{r_d}\right)^{\sigma-1}$  ,

it is indifferent between export and green-field investment ; when  $r_d$  and  $r_f$  satisfy

$f_e^{r_f(\sigma-1)} > \frac{w_f^\sigma(f_g - f_x)(w_d\tau)^{\sigma-1}}{M\left(\frac{\delta_d A_d^\phi}{w}\right)^{\sigma_i-1}} + \left(\frac{w}{\tau} f_e^{r_d}\right)^{\sigma-1}$  , green-field investment is the best entry mode of

international market; when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} < \frac{w_f^\sigma(f_g - f_x)(w_d\tau)^{\sigma-1}}{M\left(\frac{\delta_d A_d^\phi}{w}\right)^{\sigma_i-1}} + \left(\frac{w}{\tau} f_e^{r_d}\right)^{\sigma-1}$  ,

export is the best entry mode of international market.

When the fixed organization costs of export, cross board M&A, green-field investment

$$\text{satisfy } \frac{f_m - f_x}{(z\delta A^\phi)^{\sigma_i-1} - \left(\frac{w}{\tau}\right)^{\sigma_i-1}} < \frac{f_e + f_m}{(z\delta A^\phi)^{\sigma_i-1}} < \frac{f_e + f_x}{\left(\frac{w}{\tau}\right)^{\sigma_i-1}} < f_e + f_g \quad \text{or}$$

$$\frac{f_m - f_x}{(z\delta A^\phi)^{\sigma_i-1} - \left(\frac{w}{\tau}\right)^{\sigma_i-1}} < \frac{f_e + f_m}{(z\delta A^\phi)^{\sigma_i-1}} < f_e + f_g < \frac{f_e + f_x}{\left(\frac{w}{\tau}\right)^{\sigma_i-1}}, \text{ we can illuminate entry mode}$$

choice of international market in figure 2.

If  $r_d < r_f < r_m$  or  $r_f < r_d$ ,  $r_f < r_m$  and  $r_d < r_x$ , the firm exits from domestic market;

if  $r_d < r_f$  and  $r_m < r_f < r_{mg}$ , cross board M&A is the best entry mode of international market;

if  $r_d < r_f$  and  $r_{mg} < r_f$ , green-field investment is the best entry mode of international market.

$$\text{If } r_f < r_d \text{ and } r_x < r_d < r_{mg}, \text{ when } r_d \text{ and } r_f \text{ satisfy } f_e^{r_f(\sigma-1)} = \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M\left(\frac{z\delta_f A_f^\phi \tau}{w}\right)^{\sigma_i-1}}, \text{ it is indifferent between export and cross board}$$

$$\text{M\&A; when } r_d \text{ and } r_f \text{ satisfy } f_e^{r_f(\sigma-1)} > \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M\left(\frac{z\delta_f A_f^\phi \tau}{w}\right)^{\sigma_i-1}}, \text{ cross board}$$

M&A is the best entry mode of international market; when  $r_d$  and  $r_f$  satisfy

$$f_e^{r_f(\sigma-1)} < \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M\left(\frac{z\delta_f A_f^\phi \tau}{w}\right)^{\sigma_i-1}}, \text{ export is the best entry mode of}$$

international market.

$$\text{If } r_{mg} < r_f < r_d \text{ 时, when } r_d \text{ and } r_f \text{ satisfy } f_e^{r_f(\sigma-1)} = \frac{w_f^\sigma(f_g - f_x)(w_d\tau)^{\sigma-1}}{M\left(\frac{\delta_d A_d^\phi}{w}\right)^{\sigma_i-1}} + \left(\frac{w}{\tau} f_e^{r_d}\right)^{\sigma-1},$$

it is indifferent between export and green-field investment; when  $r_d$  and  $r_f$  satisfy

$$f_e^{r_f(\sigma-1)} > \frac{w_f^\sigma(f_g - f_x)(w_d\tau)^{\sigma-1}}{M\left(\frac{\delta_d A_d^\phi}{w}\right)^{\sigma_i-1}} + \left(\frac{w}{\tau} f_e^{r_d}\right)^{\sigma-1}, \text{ green-field investment is the best entry mode of}$$

international market; when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} < \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\frac{\delta_d A_d^\phi}{w})^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}$ ,

export is the best entry mode of international market.

When the fixed organization costs of export, cross board M&A, green-field investment satisfy  $\frac{f_g - f_m}{1 - (z\delta A^\phi)^{\sigma_i-1}} < f_e + f_g < \frac{f_m - f_x}{(z\delta A^\phi)^{\sigma_i-1} - (\frac{w}{\tau})^{\sigma_i-1}} < \frac{f_e + f_m}{(z\delta A^\phi)^{\sigma_i-1}} < \frac{f_e + f_x}{(\frac{w}{\tau})^{\sigma_i-1}}$  or

$$\frac{f_g - f_m}{1 - (z\delta A^\phi)^{\sigma_i-1}} < \frac{f_m - f_x}{(z\delta A^\phi)^{\sigma_i-1} - (\frac{w}{\tau})^{\sigma_i-1}} < f_e + f_g < \frac{f_e + f_x}{(\frac{w}{\tau})^{\sigma_i-1}} < \frac{f_e + f_m}{(z\delta A^\phi)^{\sigma_i-1}}, \text{ we can}$$

illuminate entry mode choice of international market in figure 3.

If  $r_d < r_f < r_g$  or  $r_f < r_d$ ,  $r_f < r_g$  and  $r_d < r_x$ , the firm exits from domestic market;

if  $r_g < r_f$  and  $r_d < r_f$ , green-field investment is the best entry mode of international market;

if  $r_f < r_d$  and  $r_x < r_d$ , when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} = \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}$ , it is

indifferent between export and green-field investment; when  $r_d$  and  $r_f$  satisfy

$f_e^{r_f(\sigma-1)} > \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}$ , green-field investment is the best entry mode of

international market; when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} < \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}$ ,

export is the best entry mode of international market.

**Scenario 2:**  $z\delta A^\phi < \frac{w}{\tau} < 1$

Under this scenario, the host country has lower relative capability to create productivity in terms of cross board M&A than parent country ( $z\delta A^\phi < 1$ ), and foreign factor cost is also lower

than domestic factor cost multiplied by transport cost ( $\frac{w}{\tau} < 1$ ). Foreign advantage in foreign factor cost is inferior to foreign disadvantage in capability to create productivity.

When the fixed organization costs of export, cross board M&A, green-field investment

satisfy  $\frac{f_e + f_x}{(\frac{w}{\tau})^{\sigma_i-1}} < \frac{f_e + f_m}{(z\delta A^\phi)^{\sigma_i-1}} < f_e + f_g < \frac{f_g - f_m}{1 - (z\delta A^\phi)^{\sigma_i-1}} < \frac{f_g - f_x}{1 - (\frac{w}{\tau})^{\sigma_i-1}}$ , we can illuminate

entry mode choice of international market in figure 4.

If  $r_f < r_d < r_x$ , or  $r_d < r_f$ ,  $r_f < r_g$  and  $r_d < r_m$ , the firm exits from domestic market;

if  $r_x < r_d < r_f < r_m$  or  $r_f < r_d$  and  $r_x < r_d < r_{xg}$ , export is the best entry mode of international market;

if  $r_d < r_f$  and  $r_{xg} < r_f$ , green-field investment is the best entry mode of international market.

If  $r_d < r_f$  and  $r_m < r_f < r_{mg}$ , when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} = \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M(\frac{z\delta_f A_f^\phi \tau}{w})^{\sigma_i-1}}$ , it is indifferent between export and cross board

M&A; when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} > \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M(\frac{z\delta_f A_f^\phi \tau}{w})^{\sigma_i-1}}$ , cross board

M&A is the best entry mode of international market; when  $r_d$  and  $r_f$  satisfy

$f_e^{r_f(\sigma-1)} < \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M(\frac{z\delta_f A_f^\phi \tau}{w})^{\sigma_i-1}}$ , export is the best entry mode of

international market. If  $r_d < r_f$  and  $r_{mg} < r_f < r_{xg}$ , when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} = \frac{w_f^\sigma(f_g - f_x)(w_d\tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}$ , it is indifferent between export and green-field

investment; when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} > \frac{w_f^\sigma(f_g - f_x)(w_d\tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}$ , green-field

investment is the best entry mode of international market; when  $r_d$  and  $r_f$  satisfy

$f_e^{r_f(\sigma-1)} < \frac{w_f^\sigma(f_g - f_x)(w_d\tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}$ , export is the best entry mode of international

market.

If  $r_{xg} < r_f < r_d$ , when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} = \frac{w_f^\sigma(f_g - f_x)(w_d\tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}$ , it

is indifferent between export and green-field investment; when  $r_d$  and  $r_f$  satisfy

$f_e^{r_f(\sigma-1)} > \frac{w_f^\sigma(f_g - f_x)(w_d\tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}$ , green-field investment is the best entry mode of

international market; when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} < \frac{w_f^\sigma(f_g - f_x)(w_d\tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}$ ,

export is the best entry mode of international market.

When the fixed organization costs of export, cross board M&A, green-field investment

satisfy  $\frac{f_g - f_m}{1 - (z\delta A^\phi)^{\sigma_i-1}} < \frac{f_e + f_x}{(\frac{W}{\tau})^{\sigma_i-1}} < f_e + f_g < \frac{f_g - f_x}{1 - (\frac{W}{\tau})^{\sigma_i-1}} < \frac{f_e + f_m}{(z\delta A^\phi)^{\sigma_i-1}}$ , we can illuminate entry

mode choice of international market in figure 5.

If  $r_d < r_f < r_g$  and  $r_d < r_x$ , or  $r_f < r_d < r_x$ , the firm exits from domestic market;

if  $r_x < r_d < r_f < r_g$ , or  $r_f < r_d$  and  $r_x < r_d < r_{xg}$ , export is the best entry mode of international market; if  $r_{xg} < r_f$ , green-field investment is the best entry mode of international market.

If  $r_d < r_f$  and  $r_g < r_f < r_{xg}$ , when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} = \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{W}{\tau} f_e^{r_d})^{\sigma-1}$ , it is indifferent between export and green-field

investment; when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} > \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{W}{\tau} f_e^{r_d})^{\sigma-1}$ , green-field

investment is the best entry mode of international market; when  $r_d$  and  $r_f$  satisfy

$f_e^{r_f(\sigma-1)} < \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{W}{\tau} f_e^{r_d})^{\sigma-1}$ , export is the best entry mode of international

market.

If  $r_{xg} < r_f < r_d$ , when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} = \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{W}{\tau} f_e^{r_d})^{\sigma-1}$ , it

is indifferent between export and green-field investment; when  $r_d$  and  $r_f$  satisfy

$f_e^{r_f(\sigma-1)} > \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{W}{\tau} f_e^{r_d})^{\sigma-1}$ , green-field investment is the best entry mode of

international market; when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} < \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{W}{\tau} f_e^{r_d})^{\sigma-1}$ ,

export is the best entry mode of international market.

When the fixed organization costs of export, cross board M&A, green-field investment satisfy

$$\frac{f_g - f_m}{1 - (z\delta A^\phi)^{\sigma_i-1}} < \frac{f_g - f_x}{1 - (\frac{w}{\tau})^{\sigma_i-1}} < f_e + f_g < \frac{f_e + f_x}{(\frac{w}{\tau})^{\sigma_i-1}} < \frac{f_e + f_m}{(z\delta A^\phi)^{\sigma_i-1}}, \text{ we can illuminate entry}$$

mode choice of international market in figure 6.

If  $r_d < r_f < r_g$ , or  $r_f < r_d$ ,  $r_f < r_g$  and  $r_d < r_x$ , the firm exits from domestic market;

if  $r_g < r_f < r_d < r_x$  or  $r_d < r_f$  and  $r_g < r_f$ , green-field investment is the best entry mode of international market.

If  $r_g < r_f < r_d$  and  $r_x < r_d$ , when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} = \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}$ , it is indifferent between export and green-field

investment; when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} > \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}$ , green-field

investment is the best entry mode of international market; when  $r_d$  and  $r_f$  satisfy

$f_e^{r_f(\sigma-1)} < \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}$ , export is the best entry mode of international

market.

**Scenario 3:**  $\frac{w}{\tau} < 1 < z\delta A^\phi$

Under this scenario, the host country has higher relative capability to create productivity in terms of cross board M&A than parent country ( $z\delta A^\phi > 1$ ), and foreign factor cost is also lower than domestic factor cost multiplied by transport cost ( $\frac{w}{\tau} < 1$ ).

When the fixed organization costs of export, cross board M&A, green-field investment

satisfy  $\frac{f_m - f_x}{(z\delta A^\phi)^{\sigma_i-1} - (\frac{w}{\tau})^{\sigma_i-1}} < \frac{f_e + f_m}{(z\delta A^\phi)^{\sigma_i-1}} < \frac{f_e + f_x}{(\frac{w}{\tau})^{\sigma_i-1}} < f_e + f_g$  or

$\frac{f_m - f_x}{(z\delta A^\phi)^{\sigma_i-1} - (\frac{w}{\tau})^{\sigma_i-1}} < \frac{f_e + f_m}{(z\delta A^\phi)^{\sigma_i-1}} < f_e + f_g < \frac{f_e + f_x}{(\frac{w}{\tau})^{\sigma_i-1}}$ , we can illuminate entry mode choice

of international market in figure 7.

If  $r_d < r_f < r_m$  or  $r_f < r_d$ ,  $r_f < r_m$  and  $r_d < r_x$ , the firm exits from domestic market; if  $r_d < r_f$  and  $r_m < r_f$ , or  $r_m < r_f < r_d < r_x$ , cross board M&A is the best entry mode of international market.

If  $r_m < r_f < r_d$  and  $r_x < r_d$ , when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} = \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M(\frac{z\delta_f A_f^\phi \tau}{w})^{\sigma_i-1}}$ , it is indifferent between export and cross board

M&A; when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} > \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M(\frac{z\delta_f A_f^\phi \tau}{w})^{\sigma_i-1}}$ , cross board

M&A is the best entry mode of international market; when  $r_d$  and  $r_f$  satisfy

$f_e^{r_f(\sigma-1)} < \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M(\frac{z\delta_f A_f^\phi \tau}{w})^{\sigma_i-1}}$ , export is the best entry mode of

international market.

When the fixed organization costs of export, cross board M&A, green-field investment

satisfy  $\frac{f_e + f_x}{(\frac{w}{\tau})^{\sigma_i-1}} < \frac{f_e + f_m}{(z\delta A^\phi)^{\sigma_i-1}} < \frac{f_m - f_x}{(z\delta A^\phi)^{\sigma_i-1} - (\frac{w}{\tau})^{\sigma_i-1}} < f_e + f_g < \frac{f_g - f_x}{1 - (\frac{w}{\tau})^{\sigma_i-1}}$ , we can

illuminate entry mode choice of international market in figure 8.

If  $r_d < r_f < r_m$  and  $r_d < r_x$  or if  $r_f < r_d < r_x$ , the firm exits from domestic market; if  $r_x < r_d < r_f < r_m$ , or if  $r_f < r_d$  and  $r_x < r_d < r_{xm}$ , export is the best entry mode of international market; if  $r_d < r_f$  and  $r_{xm} < r_f$ , cross board M&A is the best entry mode of international market.

If  $r_d < r_f$ ,  $r_x < r_d$  and  $r_m < r_f < r_{xm}$ , when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} = \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M(\frac{z\delta_f A_f^\phi \tau}{w})^{\sigma_i-1}}$ , it is indifferent between export and cross board

M&A; when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} > \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M(\frac{z\delta_f A_f^\phi \tau}{w})^{\sigma_i-1}}$ , cross board

M&A is the best entry mode of international market; when  $r_d$  and  $r_f$  satisfy

$f_e^{r_f(\sigma-1)} < \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M(\frac{z\delta_f A_f^\phi \tau}{w})^{\sigma_i-1}}$ , export is the best entry mode of

international market.

If  $r_{xm} < r_f < r_d$ , when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} = \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M(\frac{z\delta_f A_f^\phi \tau}{w})^{\sigma_i-1}}$ , it is indifferent between export and cross board

M&A; when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} > \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M(\frac{z\delta_f A_f^\phi \tau}{w})^{\sigma_i-1}}$ , cross board

M&A is the best entry mode of international market; when  $r_d$  and  $r_f$  satisfy

$f_e^{r_f(\sigma-1)} < \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M(\frac{z\delta_f A_f^\phi \tau}{w})^{\sigma_i-1}}$ , export is the best entry mode of

international market.

**Scenario 4:**  $1 < \frac{w}{\tau} < z\delta A^\phi$

Under this scenario, the host country has higher capability to create productivity in terms of cross board M&A than parent country ( $z\delta A^\phi > 1$ ), and foreign factor cost is also higher than domestic factor cost multiplied by transport cost ( $\frac{w}{\tau} > 1$ ). Foreign advantage in capability to create productivity exceeds foreign disadvantage in foreign factor cost.

When the fixed organization costs of export, cross board M&A, green-field investment satisfy  $\frac{f_e + f_x}{(\frac{w}{\tau})^{\sigma_i-1}} < \frac{f_e + f_m}{(z\delta A^\phi)^{\sigma_i-1}} < \frac{f_m - f_x}{(z\delta A^\phi)^{\sigma_i-1} - (\frac{w}{\tau})^{\sigma_i-1}} < f_e + f_g$ , we can illuminate entry mode choice of international market in figure 9. The entry mode choice of international market is similar to figure 8.

When the fixed organization costs of export, cross board M&A, green-field investment satisfy  $\frac{f_m - f_x}{(z\delta A^\phi)^{\sigma_i-1} - (\frac{w}{\tau})^{\sigma_i-1}} < \frac{f_e + f_m}{(z\delta A^\phi)^{\sigma_i-1}} < \frac{f_e + f_x}{(\frac{w}{\tau})^{\sigma_i-1}} < f_e + f_g$ , we can illuminate entry mode choice of international market in figure 10.

If  $r_d < r_f < r_m$  or if  $r_f < r_d$ ,  $r_f < r_m$  and  $r_d < r_x$ , the firm exits from domestic market; if  $r_d < r_f$  and  $r_m < r_f$ , cross board M&A is the best entry mode of international market.

If  $r_m < r_f < r_d < r_x$ , cross board M&A is also the best entry mode of international market.

If  $r_m < r_f < r_d$  and  $r_x < r_d$ , when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} =$

---

$\frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M\left(\frac{z\delta_f A_f^\phi \tau}{w}\right)^{\sigma_i-1}}$ , it is indifferent between export and cross board

M&A; when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} > \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M\left(\frac{z\delta_f A_f^\phi \tau}{w}\right)^{\sigma_i-1}}$ , cross board

M&A is the best entry mode of international market ; when  $r_d$  and  $r_f$  satisfy

$f_e^{r_f(\sigma-1)} < \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M\left(\frac{z\delta_f A_f^\phi \tau}{w}\right)^{\sigma_i-1}}$ , export is the best entry mode of

international market.

**Scenario 5:**  $1 < z\delta A^\phi < \frac{w}{\tau}$

Under this scenario, the host country has higher capability to create productivity in terms of cross board M&A than parent country ( $z\delta A^\phi > 1$ ), and foreign factor cost is also higher than domestic factor cost multiplied by transport cost ( $\frac{w}{\tau} > 1$ ). Foreign disadvantage in foreign factor cost exceeds foreign advantage in capability to create productivity.

When the fixed organization costs of export, cross board M&A, green-field investment satisfy  $\frac{f_e + f_x}{\left(\frac{w}{\tau}\right)^{\sigma_i-1}} < \frac{f_e + f_m}{(z\delta A^\phi)^{\sigma_i-1}} < f_e + f_g$ , we can illuminate entry mode choice of international market in figure 11.

If  $r_f < r_d < r_x$  or if  $r_d < r_f$ ,  $r_d < r_x$  and  $r_f < r_m$ , the firm exits from domestic market; if  $r_f < r_d$  and  $r_x < r_d$  or if  $r_x < r_d < r_f < r_m$ , export is the best entry mode of international market.

If  $r_x < r_d < r_f$  and  $r_m < r_f$ , when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} = \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M\left(\frac{z\delta_f A_f^\phi \tau}{w}\right)^{\sigma_i-1}}$ , it is indifferent between export and cross board

M&A; when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} > \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M\left(\frac{z\delta_f A_f^\phi \tau}{w}\right)^{\sigma_i-1}}$ , cross board

M&A is the best entry mode of international market ; when  $r_d$  and  $r_f$  satisfy

$$f_e^{r_f(\sigma-1)} < \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M\left(\frac{z\delta_f A_f^\phi \tau}{w}\right)^{\sigma_i-1}}, \text{ export is the best entry mode of}$$

international market.

**Scenario 6:**  $z\delta A^\phi < 1 < \frac{w}{\tau}$

Under this scenario, the host country has lower capability to create productivity in terms of cross board M&A than parent country ( $z\delta A^\phi < 1$ ), and foreign factor cost is also higher than domestic factor cost multiplied by transport cost ( $\frac{w}{\tau} > 1$ ).

When the fixed organization costs of export, cross board M&A, green-field investment satisfy  $\frac{f_e + f_x}{\left(\frac{w}{\tau}\right)^{\sigma_i-1}} < \frac{f_e + f_m}{(z\delta A^\phi)^{\sigma_i-1}} < f_e + f_g < \frac{f_g - f_m}{1 - (z\delta A^\phi)^{\sigma_i-1}}$ , we can illuminate entry mode choice of international market in figure 12.

If  $r_f < r_d < r_x$  or if  $r_d < r_f$ ,  $r_d < r_x$  and  $r_f < r_m$ , the firm exits from domestic market;

if  $r_f < r_d$  and  $r_x < r_d$  or if  $r_x < r_d < r_f < r_m$ , export is the best entry mode of international market.

If  $r_x < r_d < r_f$  and  $r_m < r_f < r_{mg}$ , when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} =$

$$\frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M\left(\frac{z\delta_f A_f^\phi \tau}{w}\right)^{\sigma_i-1}}, \text{ it is indifferent between export and cross board}$$

M&A; when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} > \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M\left(\frac{z\delta_f A_f^\phi \tau}{w}\right)^{\sigma_i-1}}$ , cross board

M&A is the best entry mode of international market; when  $r_d$  and  $r_f$  satisfy

$$f_e^{r_f(\sigma-1)} < \frac{w_f(f_m - f_x)(w_d\tau)^{\sigma-1} + M(\delta_d f_e^{r_d} A_d^\phi)^{\sigma-1}}{M\left(\frac{z\delta_f A_f^\phi \tau}{w}\right)^{\sigma_i-1}}, \text{ export is the best entry mode of}$$

international market.

If  $r_x < r_d < r_f$  and  $r_{mg} < r_f$ , when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} =$

$$\frac{w_f^\sigma(f_g - f_x)(w_d\tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + \left(\frac{w}{\tau} f_e^{r_d}\right)^{\sigma-1}, \text{ it is indifferent between export and green-field}$$

investment; when  $r_d$  and  $r_f$  satisfy  $f_e^{r_f(\sigma-1)} > \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}$ , green-field

investment is the best entry mode of international market ; when  $r_d$  and  $r_f$  satisfy

$$f_e^{r_f(\sigma-1)} < \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}, \text{ export is the best entry mode of international}$$

market.

When the fixed organization costs of export, cross board M&A, green-field investment

$$\text{satisfy } \frac{f_e + f_x}{(\frac{w}{\tau})^{\sigma_i-1}} < \frac{f_g - f_m}{1 - (z\delta A^\phi)^{\sigma_i-1}} < f_e + f_g < \frac{f_e + f_m}{(z\delta A^\phi)^{\sigma_i-1}}, \text{ we can illuminate entry mode choice}$$

of international market in figure 13.

If  $r_f < r_d < r_x$  or if  $r_d < r_f$ ,  $r_d < r_x$  and  $r_f < r_g$ , the firm exits from domestic market;

if  $r_f < r_d$  and  $r_x < r_d$  or if  $r_x < r_d < r_f < r_g$ , export is the best entry mode of international market.

$$\text{If } r_x < r_d < r_f \text{ and } r_g < r_f, \text{ when } r_d \text{ and } r_f \text{ satisfy } f_e^{r_f(\sigma-1)} = \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}, \text{ it is indifferent between export and green-field}$$

$$\text{investment; when } r_d \text{ and } r_f \text{ satisfy } f_e^{r_f(\sigma-1)} > \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}, \text{ green-field}$$

investment is the best entry mode of international market ; when  $r_d$  and  $r_f$  satisfy

$$f_e^{r_f(\sigma-1)} < \frac{w_f^\sigma (f_g - f_x)(w_d \tau)^{\sigma-1}}{M(\delta_d A_d^\phi)^{\sigma_i-1}} + (\frac{w}{\tau} f_e^{r_d})^{\sigma-1}, \text{ export is the best entry mode of international}$$

market.

## 7. Concluding Comments

In order to fully utilize both domestic and international markets and resources, MNEs from developing countries accelerate deploying production chains around the world during and after the global financial crisis. Outward FDI from developing countries has revealed special characteristics both in geographical and industrial distributions. Many MNEs from developing countries invest in the industry in which they have less ownership advantages in developed countries. In term of entry modes of international market, these firms are more likely adopt cross board M&As in developed countries, while Greenfield investments are more likely in developing and transition economies.

To these firms which have not strong ownership advantages, the entry modes also affect their survival and development after going aboard. Faced with different economic and social

---

environments of other countries, of all the firms investing overseas, some have been fairly successful by virtue of right production locations and entry modes, but others have suffered defeats due to improper strategies. So it is vital for these firms to choose a suitable production location among all other countries and a proper entry mode between M&A and green-field investment.

In order to explain special characteristics in geographical and industrial distributions of outward FDI from developing and transition economies, I develop a comprehensive theoretical model from the perspectives of heterogeneity and institutional quality to analyze entry modes of outward FDI both from developed and developing countries. According to the theoretical model, the entry mode choice of outward FDI results from the tradeoff between institution-induced productivity effect and comprehensive relative cost advantages. Especially the effect of institutional quality on entry mode of outward FDI appears to be non-linear and is contingent on foreign relative capability to create productivity and cost advantages.

The theoretical model has strong explanatory power. It can be applied to outward FDI from developed countries to developing countries, from developing countries to developed countries and from less developed countries to emerging economy by sorting the directions of outward FDI into six scenarios. Especially, under many circumstances, MNEs from developing countries can conduct FDI in the form of either cross board M&A or green-field investment according to scenario 4 and 5. So the theoretical model explains the paradox MNEs from developing and transition economies invest in industries where they don't have comparative advantages and countries whose institutional quality and economic development levels are higher than parent countries

The theoretical model also gives directions and advice on entry mode of international market. Under each scenario, we further subdivide entry modes into several situations according to relative fixed cost of different organization forms. The model shows that the right entry mode corresponding to interval for institutional quality in parent and host countries will makes the firm more productive than other entry modes given foreign relative capability to create productivity and comprehensive relative cost advantage.

---

## References

- Acemoglu, Daron and Fabrizio Zilibotti. "Productivity Differences" *Quarterly Journal of Economics*, 2001, 116, pp.563-606.
- Acemoglu, Daron, and Fabrizio Zilibotti. "Productivity Differences", *Quarterly Journal of Economics*, 2001, volume 116, pp. 563–606.
- Antras, Pol and Helpman, Elhanan. "Global Sourcing." *Journal of Political Economy*, 2004, 112(3), pp.552-580.
- Antras, Pol. "Contractual Frictions and Global Sourcing," in Elhanan, Helpman et al., eds., *The Organization of Firms in a Global Economy*. Cambridge, MA: Harvard University Press, 2008.
- Bloom, Nicholas, Benn Eifert, Aprajit Mahajan, David McKenzie, and John Roberts. "Does Management Matter? Evidence from India." *Stanford Working Paper*, 2010.
- Buckley, P. J. "New Forms of International Industrial Co-operation," in Buckley, P. J. and M. Casson (eds). *The Economic Theory of the Multinational Enterprise*. London: Macmillan, 1985.
- Cavusgil, S. T., & Naor, J. "Firm and management characteristics as discriminators of export marketing activity." *Journal of Business Research*, 1987, 15, pp.221–235.
- Chang-Tai Hsieh & Peter J. Klenow. "Misallocation and Manufacturing TFP in China and India," *The Quarterly Journal of Economics*, MIT Press, 2009, vol. 124(4), pages 1403-1448, November.
- Child, J. & Rodrigues, S. "The Internationalization of Chinese firms: A case for theoretical expansion?" *Management and Organization Review*, 2005, 1(3), pp.381-410.
- Child, J. & Tse, D. K. "China's Transition and its implications for international business." *Journal of International Business Studies*, 2001, 32, pp. 5-21.
- Davide Castellani & Giorgia Giovannetti. "Productivity and the international firm: dissecting heterogeneity," *Development Working Papers 270*, Centro Studi Luca d'Agliano, University of Milano, 2009.
- Dunning, J. H. and R. Narula. "The Investment Development Path Revisited: Some Emerging Issues," in Dunning, J. H. and R. Narula (eds). *Foreign Direct Investment and governments: Catalysts for Economic Restructuring*. London: Routledge, 1996.
- Dunning, J. H. and K. A. Hamdani (eds). "The New Globalism and Developing Countries." *New York: United Nations University Press*, 1997.
- Erika Färnstrand Damsgaard & Per Krusell. "The World Distribution of Productivity: Country TFP Choice in a Nelson-Phelps Economy," *NBER Working Papers 16375*, National Bureau of Economic Research, Inc, 2010.
- Helpman, E., Melitz, M.J. and Yeaple, S.R. "Export versus FDI with Heterogeneous Firms." *American Economic Review*, 2004, 94(1): pp.300-316.
- Hopenhayn, Hugo A. "Entry, Exit, and Firm Dynamics in Long Run Equilibrium." *Econometrica*, 1992, 60(5): 1127-50.
- Hymer, S. H.: "The International Operations of National Firms: A Study of Direct Foreign Investment". Ph.D. Dissertation. Published posthumously. The MIT Press, 1976.
- Katsuya Takii, "Persistent Productivity Differences Between Firms," *OSIPP Discussion Paper 11E004*, Osaka School of International Public Policy, Osaka University, 2011.
- Kojima, K. "Direct Foreign Investment: A Japanese Model of Multinational Business

- 
- Operations” .London: Croom Helm, 1978.
- Korhonen, H., Luostarinen, R. and Welch, L. S. “Inward–outward internationalisation patterns and government policies for Finnish SMEs.” Paper presented at the Annual Nordic Marketing Conference, University of Umea,1994,November.
- Lall, S. “Multinationals from India” in S. Lall, ed., *The New. Multinationals: The Spread of Third World Enterprises* ,1986,New York: John. Wiley & Sons.
- Lecraw, D. J. “ Direct Investment by Firms from Less Developed Countries. ” *Oxford Economic Papers*,1997, Vol. 29 (3). pp.442-457.
- Lecraw, D. J. “Third World Multinationals in the Service Industries.” London: Routledge,1989.
- M.Casson (eds). “The Economic Theory of the Multinational Enterprise. ”London: Macmillan, 1985.
- Markusen, J. R. “ The Boundaries of Multinational Enterprises and the Theory of International Trade. ”*Journal of Economic Perspectives*, 1995, Vol. 9 (2).
- Markusen, J. R., A. J. Venables, D. E. Konan and K. Zhang. “A United Treatment of Horizontal Direct Investment, Vertical Direct Investment, and the Pattern of Trade in Goods and Services.” NBER Working Paper,1996, No. 5696.
- Mathews,J.A.“Dragonmultinationals:Newplayersin21stcenturyglobalization.”*Asia Pacific Journal of Management*,2006,23(1),pp.5–27.
- Melitz, M.J. “The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity.”*Econometrica*, 2003, 71(6), pp.1695-1726.
- Nocke V. and S. Yeaple.“Cross-border mergers and acquisitions vs. greenfield foreign direct investment: The role of firm heterogeneity.” *Journal of International Economics*.2007, 72, pp.336-65.
- North, Douglass C. “Institutions. ”*Journal of Economic Perspectives*, 1991,5 (Winter),pp. 97-112.
- Oliver, C. "Sustainable Competitive Advantage: Combining Institutional and Resource-basedViews." *Strategic Management Journal* ,1997,18(9),pp. 697-713.
- Oliver, C. "The Antecedents of Deinstitutionalization." *Organizational Studies*, 1992, 13, pp.563-588.
- Qiu, L. “Cross-border Mergers and Strategic Alliances”, Working Paper, The University of Hong Kong,2009.
- Syverson, Chad. “Market Structure and Productivity: A Concrete Example.” *Journal of Political Economy*, 2004b,112(6),pp.1181-1222.
- Tolentino, P. E. “Technological Innovation and Third World Multinationals.” London: Routledge, 1993.
- UNCTAD. “World Investment Report.” New York and Geneva: United Nations, 2011.
- Vernon, R. "International Investment & international trade in the product cycle" in *Quarterly Journal of Economics*, 1966,Vol 88, 2, pp190-207.
- Volker Nocke and Stephen Yeaple. “An Assignment Theory of Foreign Direct Investment,” *Review of Economic Studies*, Blackwell Publishing, 2008,75(2). pp. 529-557.
- Wells, L. Jr. “Third World Multinationals: The Rise of Foreign Investment from Developing Countries.” Cambridge: MIT Press,1983.

Appendix:

附录:

$\Pi$

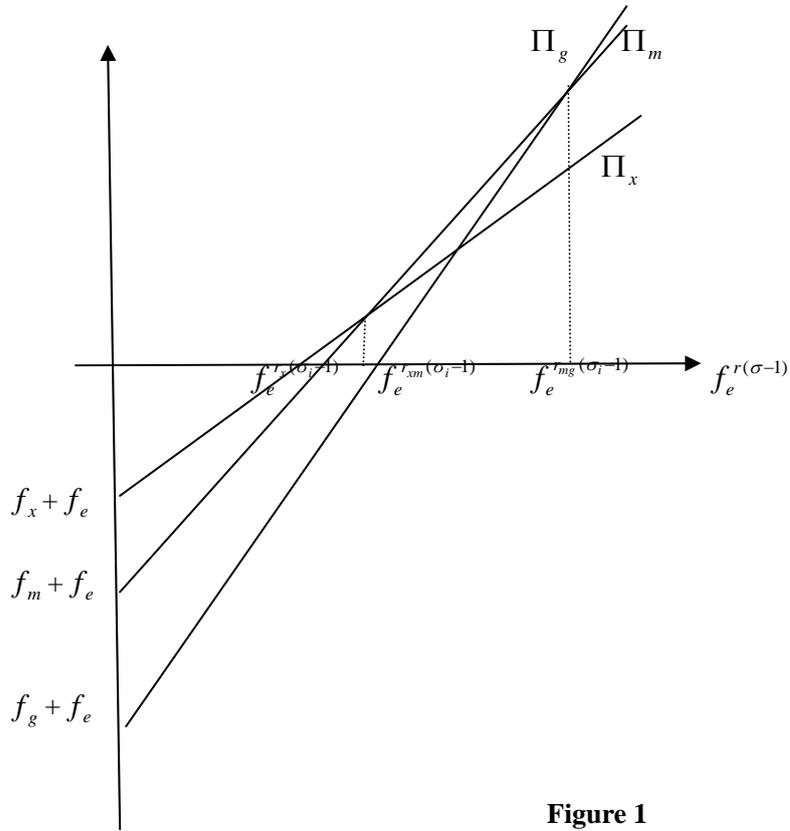


Figure 1

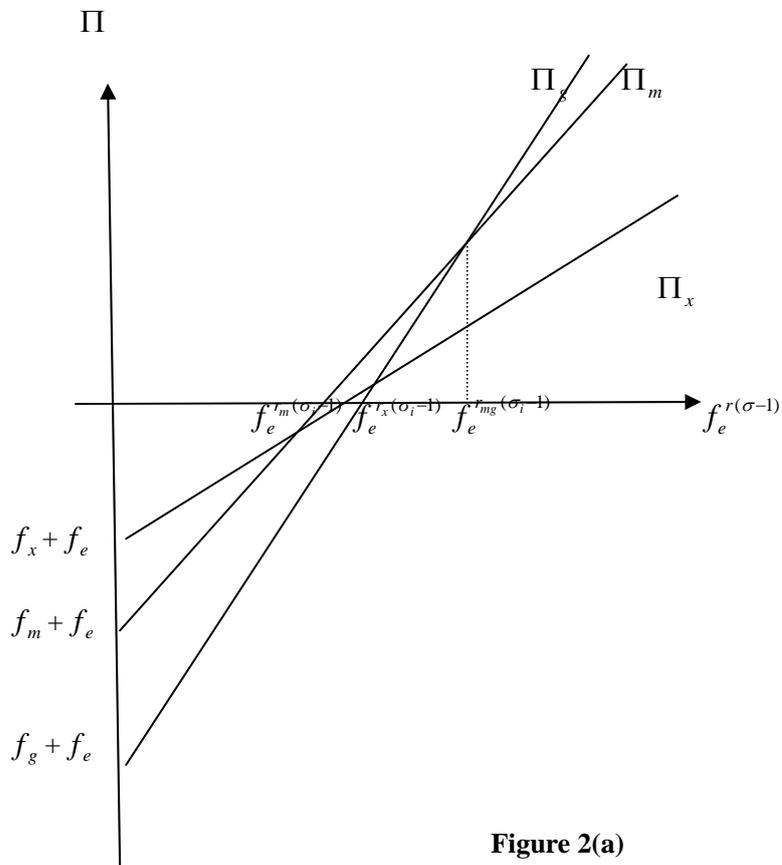


Figure 2(a)

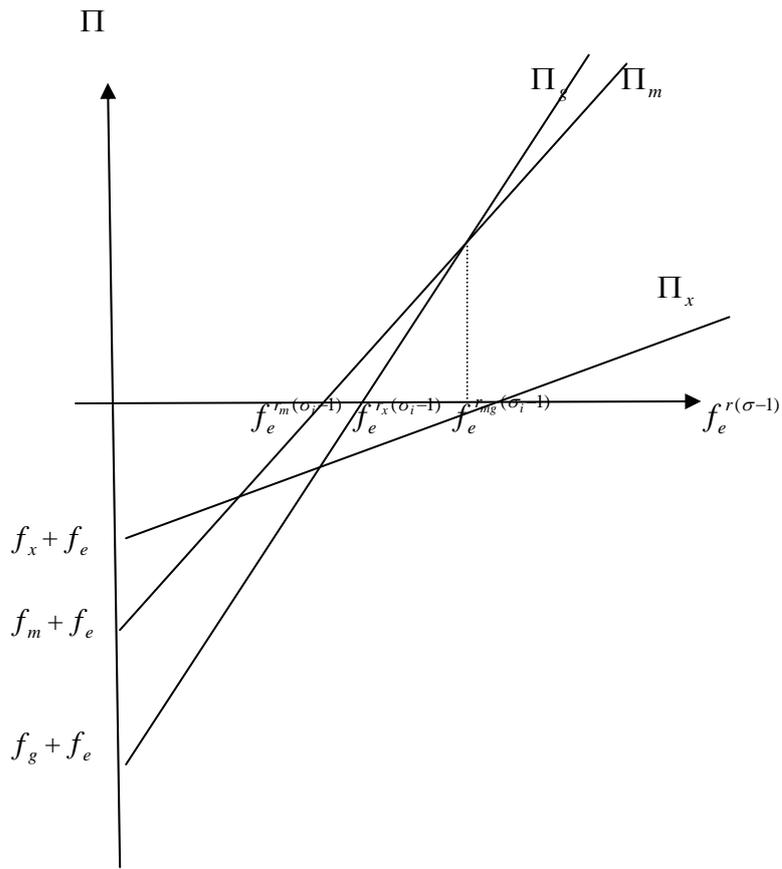


Figure 2(b)

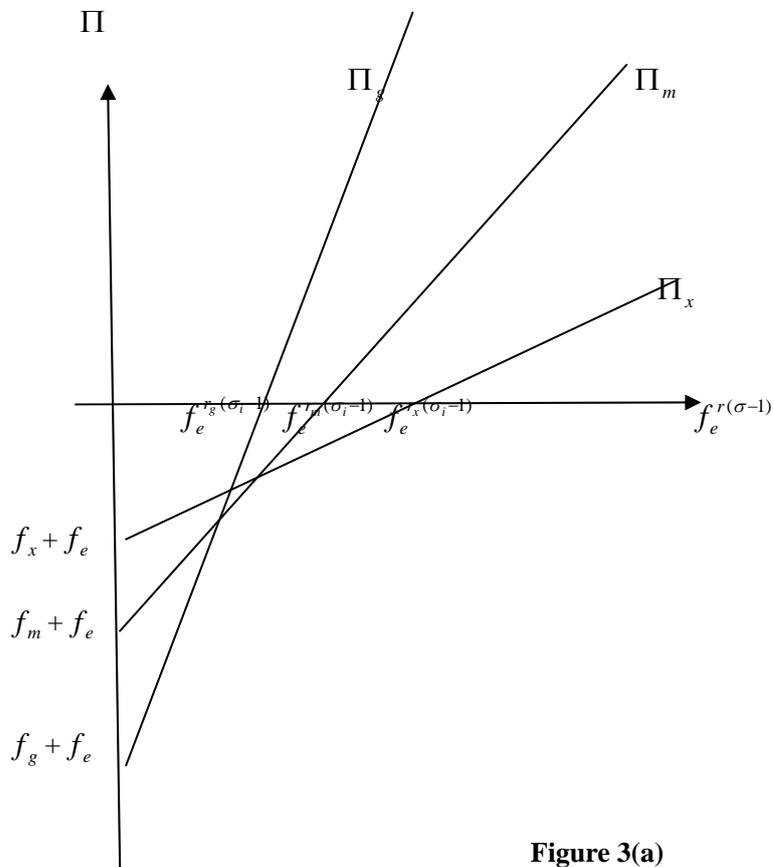


Figure 3(a)

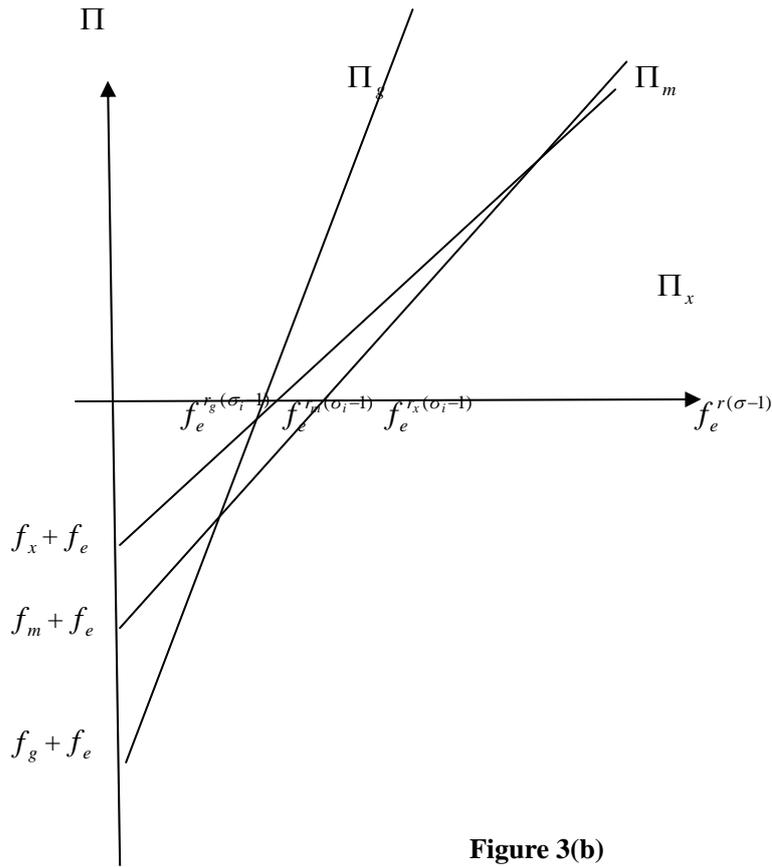


Figure 3(b)

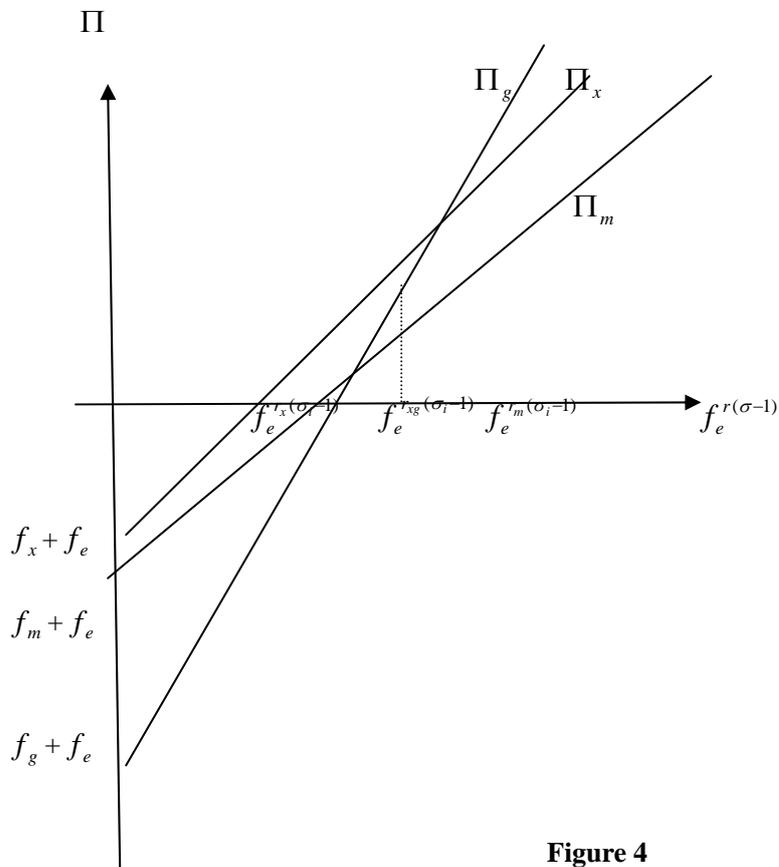


Figure 4

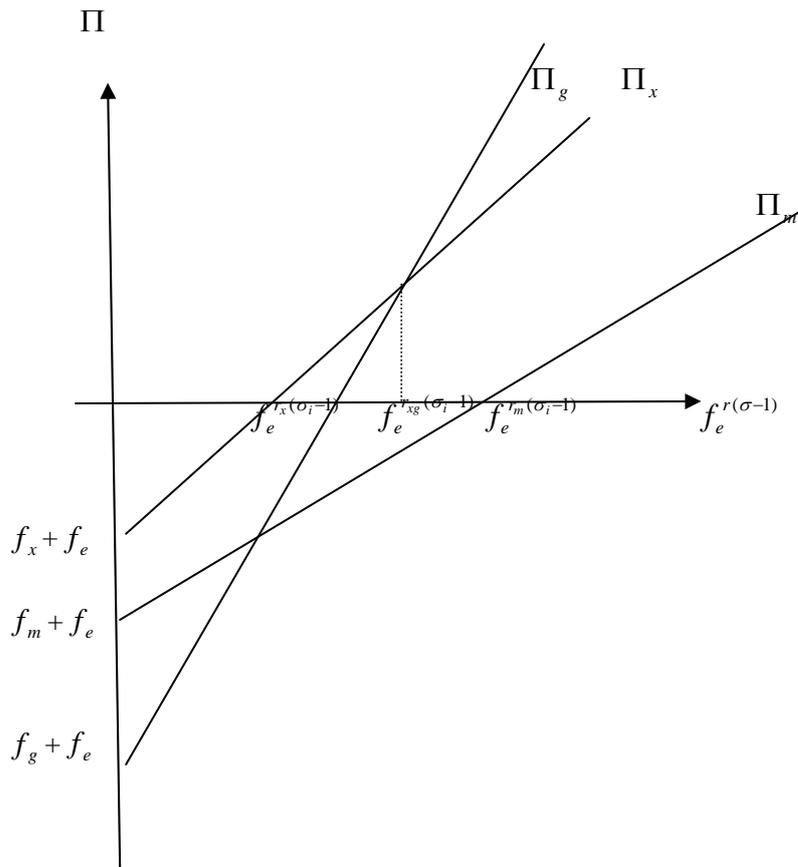


Figure 5

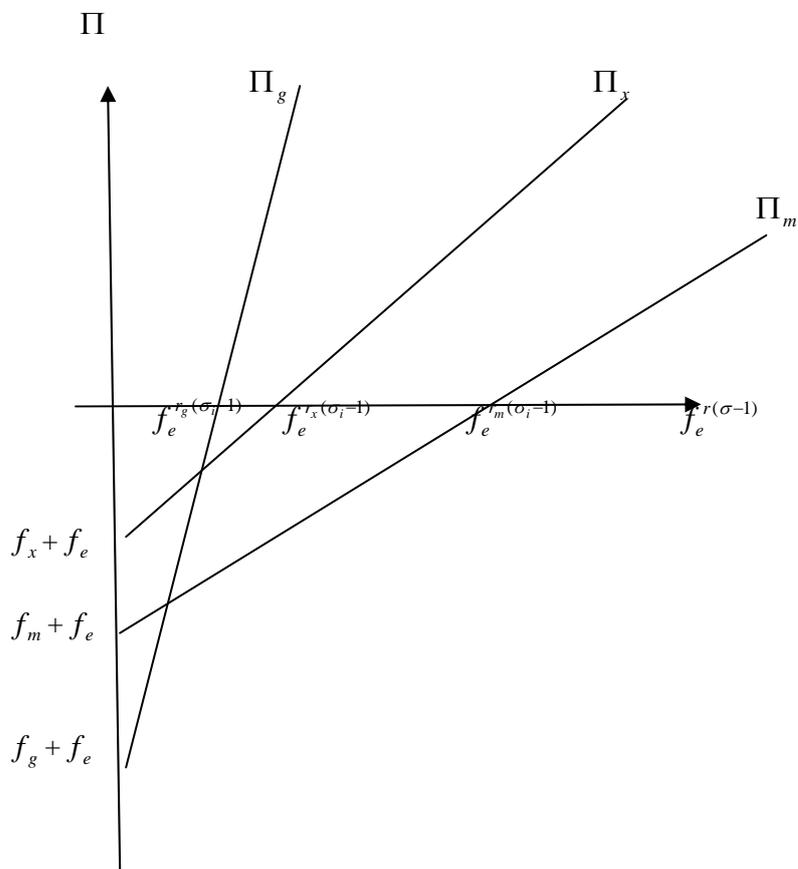


Figure 6

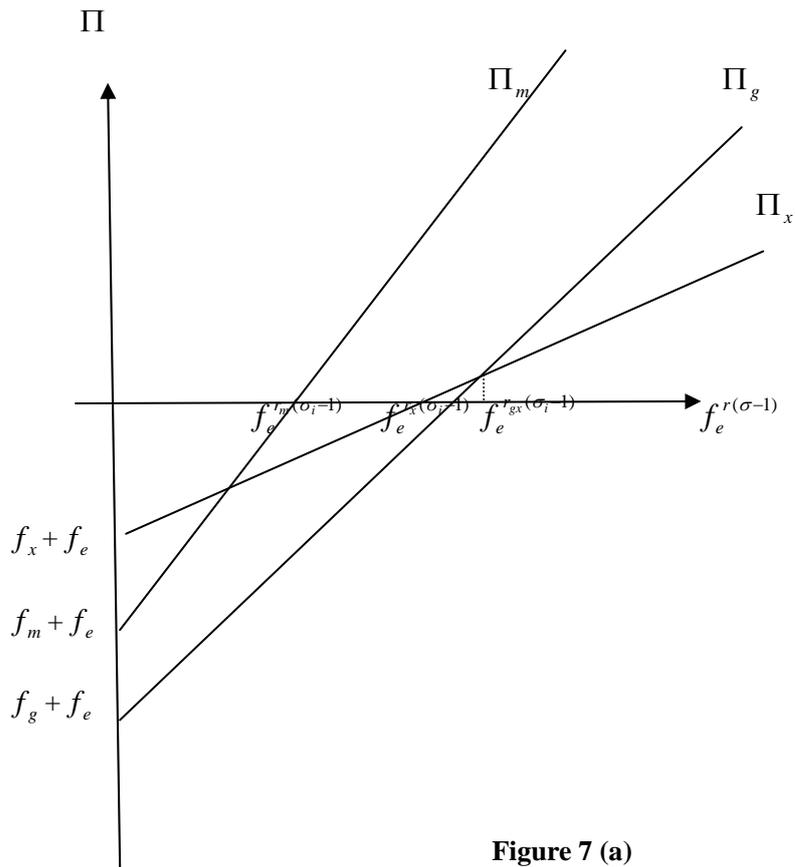


Figure 7 (a)

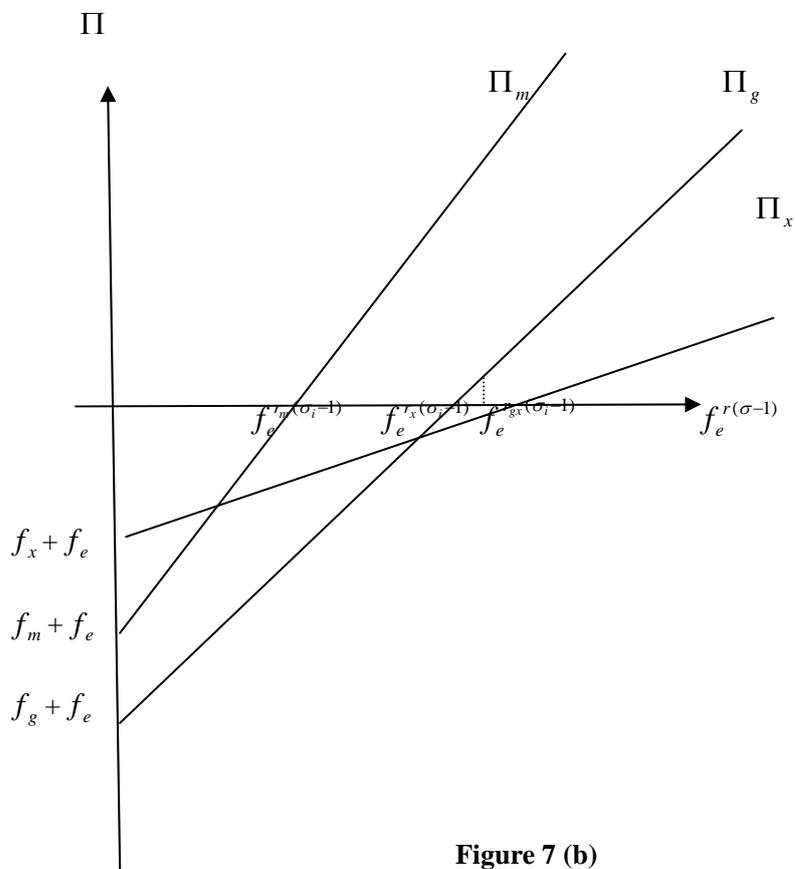


Figure 7 (b)

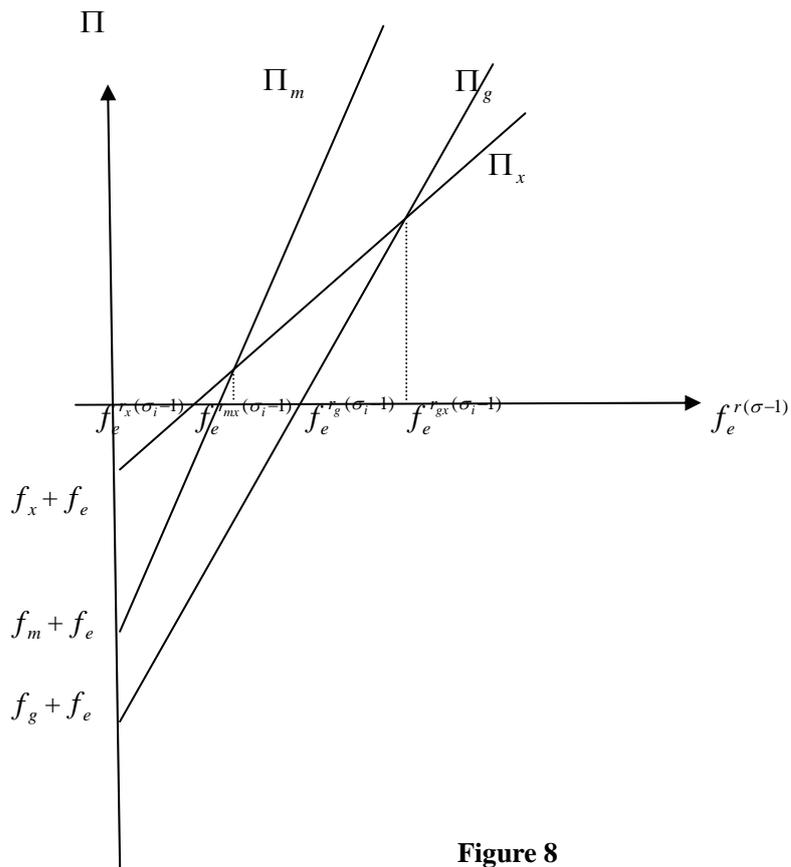


Figure 8

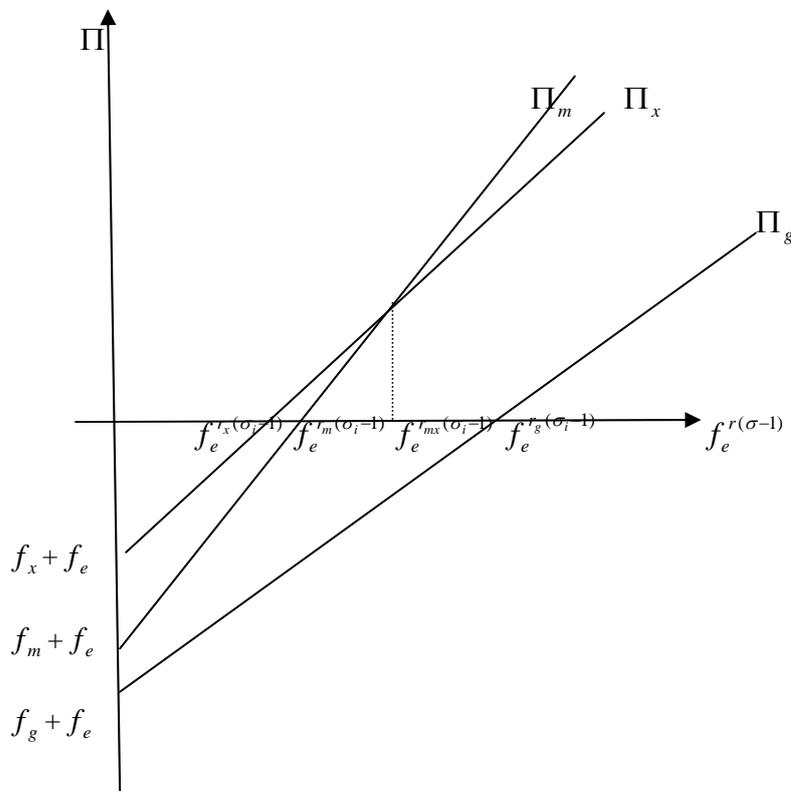


Figure 9

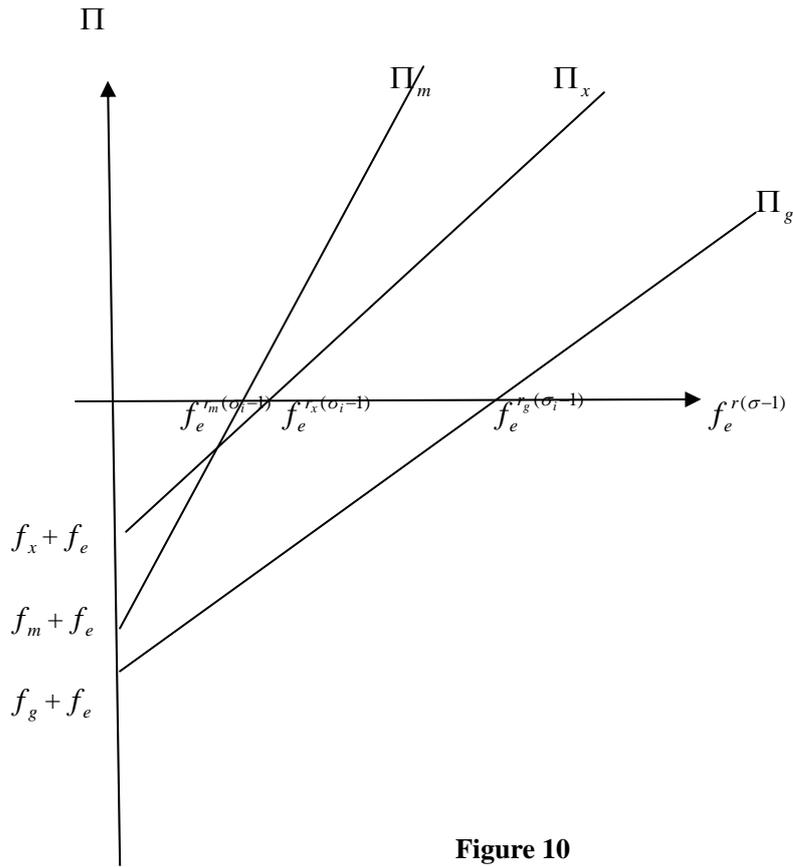


Figure 10

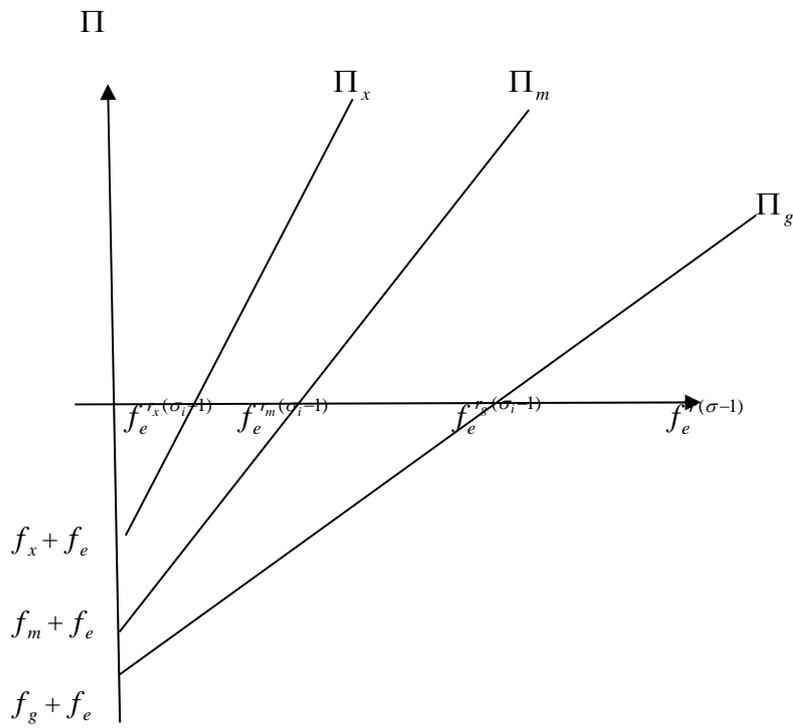


Figure 11

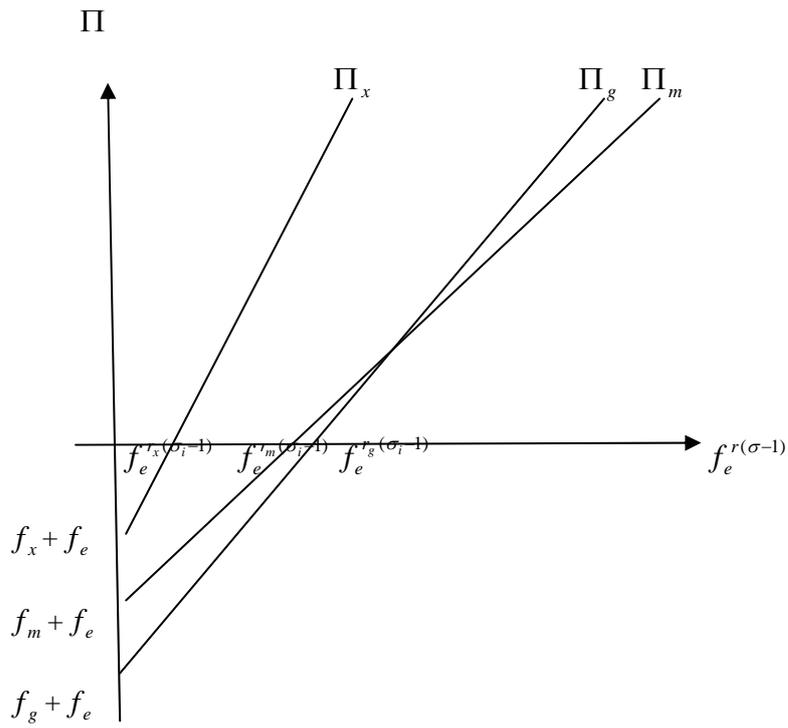


Figure 12

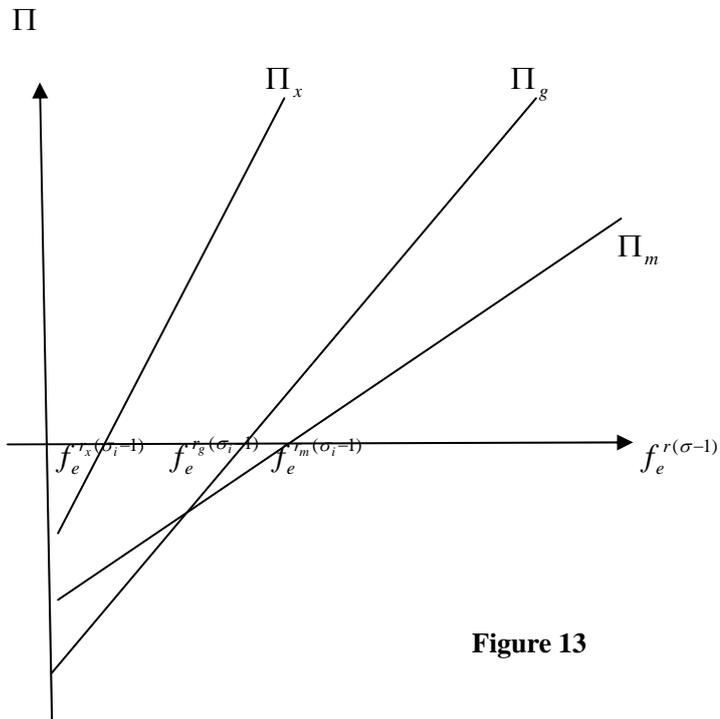


Figure 13