

# **Multinational investment, intra-industry trade and contracts in transition economies: A case study for food-industries**

**Eleni Kaditi**

Katholieke Universiteit Leuven

[Eleni.Kaditi@econ.kuleuven.ac.be](mailto:Eleni.Kaditi@econ.kuleuven.ac.be)

Analysis is focused on foreign affiliates of food industries in transition economies of CEECs. Dividing our investigation into two distinguished phases, the main question will be whether home and host countries' welfare are improved by IIT and FDI through particular strategies of food multinational companies; where the parent company is located in one country of EU-15 and its affiliate in a CEE country. In phase one, the parent company specifies a non-marketed commodity, which is provided by a foreign supplier, to a foreign subsidiary (affiliate) that uses the product as an input to produce a product it then sells. In phase two, the affiliate is able to produce the input or allowed to have it from local instead of foreign suppliers. This significant change in 'resourcing-inputs' has important implications at both country and firm level, depending particularly on how contract enforcement influence FDI and intra-industry trade into host economies; and on how profits and host country welfare are affected. Using game theory analysis, we show how a binding and/or non-binding contract may be suitable only for the early stage of economic transition (phase one), while strict contract enforcement may be necessary later as the economy develops (phase two onwards). We also check for the role of the host country's government through its taxation and industry policies; as well as which are the implications for multinational investments and contract-decisions. Under this investigation, we try to show how an institutional set-up may encourage FDI in transition economies.

I. Introduction	1
II. Food-industries in CEECs	3
FDI, MNEs and Trade Agreements	4
Regulatory Framework	7
Schoeller - Budatej BT	9
III. Model	11
Review of knowledge	11
Problem Definition - Methodology	12
The Game	15
Non-binding contract	16
Binding contract	19
Stackelberg equilibrium	20
IV. Conclusion	21
References	23
Annex	33

## I. Introduction

Immediately after transition started, liberalisation in trade and capital flows became the first vehicles of the Central and Eastern Europe's (CEE) reintegration. The European Union (EU) quickly established diplomatic relations with the countries of this region, concluding to the so-called 'Europe Agreements' both with the eight new members of EU-25 and the two candidate countries, which all became the EU-15's second biggest trade partner<sup>1</sup>. Capital flows were first very modest, and concentrated in a few countries. Over time, however, foreign direct investments (FDI) have gained importance, reinforcing a successful reintegration of these countries into the world economy, which is and will continue to change their economic landscape. The notion is that an initial inflow of investment will help to modernise industry and open up international markets, which in turn will increase the profitability of production and attract even further FDI.

Thus, FDI is generally considered as having positive effects on the industrial restructuring and firms' performance in transition economies. This is accomplished through (i) the corporate governance, (ii) the acceleration of firms' restructuring, and (iii) the renovation of physical assets. FDI has also a spill-over effect on the domestic-owned firms by forcing them to adopt similar strategies in order to stay in the market. On the other hand, FDI can be detrimental to the creation of competitive markets if it leads to elimination of competitors and monopolistic or oligopolistic situations [Duponcel M., 1998].

The amount of FDI attracted in every transition economy depends on several economic and political factors. The existence of a stable monetary system aimed at reducing inflation and maintaining a strong and convertible national currency has been an important factor, as well as liberalisation of the economy and a stable political system. The countries that have made greatest efforts to adopt features of a market economy, such as Hungary, Czech Republic, Poland, and Estonia, have also attracted the largest share of FDI [Oxelheim L. and P. Chauri (eds), 2004].

The fact that this region opened its markets to foreign investors only in the 1990s is reflected by its low transnationality index<sup>2</sup> number. The lower-income partner (CEECs) exported labour-intensive products and imported capital-intensive products and, consequently trade had mostly

---

<sup>1</sup> Since the 1<sup>st</sup> of May 2004, the new members of EU from CEE are Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia; while the candidate countries are Bulgaria and Romania.

<sup>2</sup> Transnationality index is a weighted average of three ratios: foreign assets / total assets, foreign sales / total sales and foreign employment / total employment.

an inter-industrial nature. Nevertheless, the increasing presence of multinational companies encouraged trade between them and their affiliates in transition economies (intra-industry trade - IIT). This is consistent with the increasing importance of the CEE area for EU direct investors.

In recent years, for the food sector specifically, the processed food industries have grown rapidly (when measured by their contributions to GDP) in several countries, many of which are foreign affiliates of multinational companies. The share of the affiliates in exports also tends to be high and increasing, validating the dual role of multinationals. That is (i) transfer of technology, and (ii) transformation of many countries from being exporters of primary commodities to being exporters of manufactures. Finally, economic globalisation, including FDI, and trade liberalisation are linked to a revolution in production patterns and a stronger effect on growth within the host countries of affiliates that were shifted with the reallocation of resources. It is then obvious that a sustained investigation of the effects of multinational activity in terms of social welfare is necessary in order to understand their role in the economic development of transition countries in particular.

The majority of previous research is focused on the so-called 'transaction-cost' approach, which is applied to the horizontal multinationals and receives strong support in empirical studies [ex., Graham E., 1998; and Baldwin R., 2001]. A few economic models are also used to explain vertical integration of multinationals and the dominant 'transaction-cost' approach is again one of these<sup>3</sup>. However, only little reference is made in the literature to 'new' theories of industrial organisation for multinationals, which are largely driven by applications of game theory [Pontes J.P., 2001 and 2000]. Few studies have also focused on the welfare effects of FDI flows in the food sector and on the welfare effects of food-multinationals activities both at home and host countries. Most of the empirical studies in food and related sectors concluded that FDI was conducive to economic growth in the host countries, but substituted for trade in the home countries. FDI is also found to have a stronger effect on growth and trade when combined with trade liberalisation. However, the welfare effects of multinational activity have not been yet clearly identified.

Our analysis will, therefore, be focused on the particular case of foreign affiliates of food industries in transition economies of CEECs. Dividing our investigation into two distinguished phases, the main question will be whether home and host countries' welfare are improved by IIT and FDI through particular strategies of food multinational companies; where the parent company is located in one country of EU-15 and its affiliate in a CEE country. In phase one, the parent company specifies a non-marketed commodity, which is provided by a foreign supplier,

---

<sup>3</sup> For an extending presentation see Caves R., 1996.

to a foreign subsidiary (affiliate) that uses the product as an input to produce a product it then sells. In phase two, the affiliate is able to produce the input or allowed to have it from local instead of foreign suppliers. This significant change in 'resourcing-inputs' has important implications at both country and firm level, depending particularly on how contract enforcement influence FDI and intra-industry trade into host economies; and on how profits and host country welfare are affected.

Using game theory analysis, we show how a binding and/or non-binding contract may be suitable only for the early stage of economic transition (phase one), while strict contract enforcement may be necessary later as the economy develops (phase two onwards). We also check for the role of the host country's government through its policies – taxation and import tariffs; as well as which are the implications for multinational investments and contract-decisions. Under this investigation, we show how an institutional set-up may encourage FDI in transition economies.

The remaining parts of this paper are organised as follows: In the next section a detailed 'background' of the food multinationals in CEECs is illustrated, with particular reference to issues related to FDI, multinational companies and trade agreements. A brief overview of the regulatory framework in the respective countries as well as an empirical example follows. In section III we review the theory and the model of our interest is presented. Based on the main results of the game and the various contractual arrangements that are discussed, we investigate the equilibrium for binding and non-binding contracts, respectively. Finally, section IV concludes with some general remarks.

## **II. Food-industries in CEECs**

FDI flows to the CEECs have not occurred on a scale or in patterns predicted at the outset of transition. In the early 1990s there was opposition in several CEECs to foreign ownership, and inward FDI into the region remained modest. Foreign operation by affiliates of multinationals was, therefore, a necessary prerequisite for gaining market access and expanding the firm's operation. A marked shift in attitude toward FDI occurred only in the second half of the 1990s, when CEECs began to liberalize foreign ownership rules and considerable incentives were offered to strategic investors. These together with more liberalized trade relations have, undoubtedly, affected IIT and FDI. In general, trade barriers declined sufficiently but multinationals have faster activity growth than trade. Not to forget also, that particular rules always apply to agriculture and to its closest parts of the food sector; which enjoy continuous tariff protection. For the food industry particularly, this could be a plausible explanation for the significant increase in the foreign ownership share, while the trade index has only increased

moderately. A general overview of FDI, multinationals' activity and trade agreements in CEECs follows.

### **FDI, MNEs and Trade Agreements**

As already mentioned, the chances of attracting FDI are not similar for all countries in the CEE region, because they depend on variables such as political and economic stability, human capital development, location-specific advantages and infrastructural facilities. Moreover, and despite similarities of CEECs' systematic background, differences still do exist in terms of economic structure, international economic cooperation and transformation process. In general however, at the beginning of transition, the development of export-oriented industries had been seriously neglected by traditional industrialization strategies that focused on import substitution and enjoyed high protection.

It was during the second half of the previous decade that inward FDI stock in CEE countries quadrupled, from \$40 billion to \$160 billion; and by 2000, the region had almost completely caught up with the rest of the world<sup>4</sup>. Most FDI in CEE comes from EU-15 and major part of the capital is invested in the manufacturing sector. Countries close to the EU<sup>5</sup> attract almost exclusively export-oriented greenfield investment; since these are the areas that provide the best transport facilities and lowest transaction costs for multinationals, while investors enjoy relatively low labor costs. In other words, firms whose country of origin is close to CEE, such as Austria and Italy, are more likely to be driven by efficiency motives.

*[Table 1, here]*

Foreign affiliates also tend to be more export-oriented than their local peers and more importantly, they 'step-up' their investments in other CEECs. That is, a double shift of FDI appears when FDI from EU-15 goes to the 1<sup>st</sup>-tier of CEECs and afterwards from there to the 2<sup>nd</sup>-tier of CEECs<sup>6</sup>. It is also usual that firms invest to keep within the multinational some type of intangible asset that they have, rather than to exploit through licensing. Furthermore, investing firms are often the larger firms in their industries [World Investment Directory, 2003]. In numbers, the investors of the 25 largest MNEs based in this region held \$2.3 billion in assets and had foreign sales worth \$3.7 billion, for 1998. The value of the transnationality index is,

---

<sup>4</sup> In the late 1990s, there was a slight decline experienced in FDI flows due to the ending of privatisation in most CEECs, suggesting that without new impetus, FDI flows may stay at the current levels.

<sup>5</sup> Countries like Hungary, Poland, Czech Republic and Slovakia.

<sup>6</sup> In general and based on most countries' experiences, FDI is a final stage in long-term inter-enterprise cooperation and outward FDI follow after a company has been host to inward FDI. The paradox with transition economies in CEE is that their companies invested abroad before hosting FDI, possibly due to the fact that inward FDI was prohibited for ideological reasons in socialist countries.

however, relatively low due to low levels of employment in these MNEs<sup>7</sup> [World Investment Report, 1999].

*[Table 2, here]*

Finally, CEECs experienced lot of trade-liberalization policies derived from the bilateral ‘Europe Agreements’ with the EU-15, two regional agreements – the Central European Free Trade Agreement, CEFTA and the Baltic Free Trade Area, BAFTA – as well as their membership in the WTO. Import quotas on a number of products are, in general, removed and free trade in goods and services is established, with the exception of some agricultural products.

*[Table 3, here]*

For the food industry, specifically, FDI and the establishment of foreign affiliates have contributed to economic integration during the 1990s. Most EU-15 countries are large 'net-creditors' in this sector, while transition economies are large 'net-debtors', indicating their need for FDI inflows to help restructuring their economies. Inward FDI stock appears with an upward trend in most countries, but the degree of FDI penetration is considerably differentiated across nations. Plausible reasons could be the differences in the size of the food industry in the respective countries and a differing degree of internalization (i.e. the importance of foreign affiliates in the food industry based on value-added, employment and R&D spending)<sup>8</sup> [OECD, 2002].

*[Figure 1, 2 and 3, here]*

On the other hand, and despite the ‘infant’ institutional framework of this sector, the types of products traded have changed over the years, away from the one-way flow of undifferentiated raw materials towards the supply of differentiated products from any country that can establish quality and credibility of supply. In other words, food industry has developed from a sector which primarily processed and sold to national consumers to a global sector competing for market share.

Thus, apart from the fact that the food industry plays an important role in all CEE countries, the main reason for our analysis to be focused on this sector is that FDI in this sector accounts for a significant part of total investments in the region (approximately one-third). More importantly, our model fits exactly with the fact that investments are mainly concentrated in activities towards the end of the value chain, linked to the final consumption stage. There are two

---

<sup>7</sup> The same stands for the affiliates in the food industry.

explanatory factors for this process. First, food industries in Western Europe follow aggressive marketing strategies, in an effort to achieve economies of scale in production and distribution for their large varieties of highly differentiated products. Hence, Western food multinationals, like Unilever and Nestlé, view CEE as offering an enlarged market for their products. Second, in the formerly planned economies, food industry was dominated by large state-owned firms that lack in production and marketing capabilities, but accounted for a large proportion of production and exports. After 1990, and during the transition, domestic investors were reluctant to the responsibilities of ownership; therefore, privatization process was mainly accomplished with foreign participation.

*[Figure 4, 5 and 6, here]*

Based on Alessandrini S. (2000), foreign investors were mostly interested in already well-established local firms, such as sugar-refining, brewing, distilling, vegetable oil, confectionery, and chocolate industries. Their aim was to reinforce their dominant position in the European market. On the contrary, firms particularly in the dairy, canning and meat sectors, which suffered among others from low profitability and uncompetitive production structures, were producing for the former Soviet Union. Thus, during transition, their economic condition worsened due to the shift of consumers towards foreign products and the decreased domestic food consumption. As a result, they were not at all attractive to foreign investors. According also to Josling T. *et al* (1995), most of the investment in the food industry is in the more highly processed food which does not contain a high raw material content.

In general, there are 239 operations in CEE from enterprises in EU-15. Main participants are from Germany, Italy, the Netherlands, France and Austria, while main host countries are Poland, Hungary and Czech Republic. Based again on the database that Alessandrini S. (2000) used, it appears that for the food sector, it was the concessions offered by host governments that attracted most foreign investors (ex. tax holiday) instead of the market position or the economic situation of the firms. Other reasons for investing in this sector were also the quality of local suppliers, the lower wages, the relatively developed infrastructures, and the growing regional markets. In any case, foreign investors' aim was their products' differentiation and therefore, the improvement of products' quality was their main concern.

*[Figure 7, 8 and 9, here]*      *[Table 4 and 5, here]*

---

<sup>8</sup> Comments drawn from OECD, 2002, 'Measuring Globalization: The role of multinationals in OECD economies', Paris.



Finally, according to the survey by Genco P. *et al* (1993), the main two reasons for a parent food industry to invest in a CEEC-5<sup>9</sup> are: (i) to penetrate new markets, and (ii) to broaden the market for their own products. The companies surveyed were asked to rank the importance of each reason, while the points range from zero (minimum) to three (maximum). The results of this survey appear in Table 6.

### **Regulatory Framework**

It is widely accepted that foreign investment is one of the most important instruments in economic restructuring, alongside privatization. The choice of becoming multinational will yet involve the firm in a variety of additional costs such as those dealing with foreign administrations, regulations and tax systems. These can be alleviated collaborating with local firms through joint ventures, licensing arrangements, or sub-contracting. A multilateral regulatory framework is then needed (ex. trade liberalization), otherwise, FDI can cause unintended impacts (ex. excessive monopoly power and environmental degradation). Nevertheless, the relative high prevalence of regulations and policy interventions, particularly in the food industry, can influence at high-level foreign investment decisions in this sector.

In the case of CEECs, ideological reasons eliminated the possibility of FDI in socialist economies, including FDI across themselves, but to a lesser extend from socialist economies to non-socialist. Agreements such as joint ventures effectively established partnerships, linking socialist state or cooperative enterprises with foreign one. Initially, for example, foreign investors could control up to some extent the allocation of income, due to legal limitations imposed on FDI in socialist economies. These restricted agreements in combination with other economic problems led to stagnation of industrial cooperation up to the end of 1980s, despite the fact that, the promotion of industrial cooperation with foreign firms had already become a major objective of the CEE socialist economies, early in 1960s. Only when political and economic changes took place in the Soviet Union and a growing number of CEECs relaxed restrictions related to FDI, previous problems could be overcome.

In particular, rapid changes in ownership legislation provide now possibilities for majority or even sole foreign ownership, in an effort to establish a transparent and understandable economic system in all countries of the region. Not to mention foreign takeovers of previously state enterprises and direct establishment of subsidiaries. FDI legislation was also liberalized further in order to attract foreign capital. CEECs started to compete with each other by offering a variety of FDI incentives (ex. preferential treatment and tax incentives) independently of their

---

<sup>9</sup> Czech Republic, Estonia, Hungary, Poland and Slovenia.

potential effectiveness. As a result, stability in the FDI regimes could not be guaranteed. Eventually, and despite the ideological and systematic barriers that yet had to be overcome, under the new legislations, greater motivation for contracts than licensing or cooperation agreements were provided, outweighing the multinationals' traditional intensity of controlling wholly-owned subsidiaries. CEECs could, therefore, benefit from technology and new methods of management, while sharing risks with the foreign investors [Artisien P. *et al* (eds), 1993].

More recently, CEECs keep on competing with each other for foreign investments and thus, the majority has still investment incentive schemes. This is in contradiction to the general basic rule for national treatment of foreign affiliates in all CEECs, and the restricted possibilities for discriminatory policies derived from the Organization for Economic Cooperation and Development<sup>10</sup> as well as from the EU Association Agreements<sup>11</sup>. Nevertheless, the eight new members of EU-25 from CEE, allow foreign investors in most fields of activity on the basis of national treatment, by the mid-1990s. In compliance with EU regulation, their investment incentives are increasingly integrated into labor market, regional development and R&D policies. A few restrictions related to land and buildings only remain, while no restrictions both on the transfer or conversion of currency and on performance requirements are implied. Additionally, international agreements aim at creating a favorable investment climate and proactive promotion activities tend to attract FDI in all new members from CEE (ex. BITs and DDTs)<sup>12</sup>. Finally, CEECs have become parties to maintain international investment-related instruments, such as the Convention on the Recognition and Enforcement of Foreign Arbitral Awards, CREFAA; the Convention on the Settlement of Investment Disputes between States and Nationals of other States, ICSID; the Convention Establishing the Multilateral Investment Guarantee Agency, MIGA; as well as to three main WTO investment related agreements<sup>13</sup>.

To conclude, during the last decades, CEECs applied different degrees of formal liberalization to foreign investors, with continuously more liberal models, while following the progress of their economic reforms<sup>14</sup>. Alternative organisational models of FDI - forms of foreign participation - combined with the respective transaction and control costs with respect to growing degree of internalisation appear in Figure 10 and show the evolution of different types of multinationals established in countries such as in CEE, for different levels of formal

---

<sup>10</sup> Members are Czech Republic, Hungary, Poland and Slovakia.

<sup>11</sup> For a detailed presentation of the regulatory framework, see World Investment Directory, 2003, p. 20-29.

<sup>12</sup> BITs and DDTs are bilateral investment and double taxation treaties, respectively.

<sup>13</sup> These are the General Agreement on Trade in Services (GATS), the Agreement on Trade-related Investment Measures (TRIMS), and the Agreement on Trade-related aspects of Intellectual Property Rights (TRIPS).

<sup>14</sup> For a detailed historical review see Artisien P. *et al*, 1993, Chapter 9.

liberalization. The real costs of restructuring these economies were associated to (i) a reshaping of attitudes to work and wealth creation; (ii) the redesigning of the business and legal framework (especially with respect to property rights and contractual relationships); (iii) the costs of setting up a market system; and (iv) the introduction of macro-economic policies (especially with respect to domestic savings, currency convertibility and an open trade system). All these combined with many other necessary ingredients that multinationals are uniquely able to supply can lead to general economic growth [Artisien P. *et al* (eds), 1993].

*[Figure 10, here]*

### **Schoeller - Budatej BT<sup>15</sup>**

Having in mind the previous analysis, an empirical example will be briefly presented here that will help better understand the game theory analysis which follows. This is the case of Schoeller Lebensmittel GmbH & Co KG, an ice-cream and frozen foods manufacturer with its headquarters in Germany, and its investment in Hungary. Instead of a greenfield investment, a joint venture with an existing firm in Hungary occurred, as this was a better way to obtain substantial market share rapidly. Schoeller was a family-owned firm until 1994, when the majority ownership was transferred to Sudzucker AG. It has production, marketing and distribution subsidiaries in a number of EU-25 countries. The headquarters are in Nuremberg, while the company aims to be relatively decentralized and to give some local decision-making autonomy to its subsidiaries – with the exception of decisions concerning annual budgets and investment plans which are agreed with the headquarters. There is also closer central management coordination with the subsidiaries in CEE. Its main strategy is to focus on market share that depends on quality and advertising.

The decision to invest in Hungary was motivated by this strategy, as CEECs are seen as markets for future. The main reasons for choosing this country as an initial location was that its market was most developed and a subsidiary in Austria was close and could support the project. The aim was both to produce for the Hungarian market and to use the investment as a basis for expanding into markets further east through exports. The existence of a suitable partner in Hungary added to this decision. The firm chosen was Budatej, a cooperative of 12 agricultural companies. It was the market leader of ice-cream production, located close to Budapest, with an already existing distribution network of 12 subsidiaries across the country. The final agreement

---

<sup>15</sup> All information comes from Estrin S., K. Hughes and S. Todd, 1997, *Foreign Direct Investment in Central and Eastern Europe, Multinationals in Transition*, The Royal Institute of International Affairs; as well as from Mr. L. Szeder, Head of purchasing, Nestlé-Schoeller.

was made in autumn 1991, with initial ownership 51 per cent for Schoeller, which was raised to 100 per cent in April 1995, reflecting Schoeller's desire for full control. The firm was called Schoeller – Budatej BT.

Schoeller received some incentives by the local government for this investment. These were mainly tax advantages (60 per cent tax relief on reinvested profits) and permission to bring machines without paying import tariffs (at least for three years). Schoeller – Budatej was effectively reconstructed by introducing new production lines, altering the infrastructure, rebuilding distribution warehouses and providing new freezers to shops. The same production technology as in Germany is applied, while employment increased. Initially, there was substantial management control from the headquarters; however, the subsidiary obtained later more autonomy in a number of decision areas.

The company produces two groups of products: the Schoeller branded products like Movenpick and Manhattan and the private products like Leo, Leo Cones and Bambino. About 90 per cent of production is for the domestic market and 10 per cent is exported to other CEECs. Production costs were initially about the same as in Germany, because most of the raw material inputs had to be imported and import duties increase their cost. Even if Schoeller aims in its subsidiaries to obtain inputs locally, this was not possible because it depends on raw product quality levels. For example, fruit quality was often not of sufficient quality, and so had to be imported. High-quality chocolate was also imported by German suppliers as well as packaging materials.

Before and after the Nestlé acquisition in 2003, the raw materials are, in general, specified from the parent company or the subsidiary can use its raw materials after a permission procedure. That is, if Nestlé – Schoeller (under the new name) can find a good local supplier, it sends the specification and the sample to the Quality Assurance Department of Schöller in Nürnberg. If these are in order, then it can start the purchasing procedure. The Quality Assurance Department visits some of the most important factories too and supervises the manufacturing and the final goods. The subsidiary is now developing some materials in corporation with other companies like stabilisators, fruct goods or foils. Finally, Nestlé has a lead buyer system, so that each purchaser is responsible for a specific group of products (ex. Nestlé in France is responsible for fruct goods and coconut oil, in Germany for the plastic boxes, and in Hungary for foils and carton boxes). This means, for example, that the purchaser from French Nestlé collects all the required quantities from Middle and West European Regions. It negotiates with the possible suppliers, it chooses the best, and makes the contract for all the countries. After this procedure all other Nestlé firms make the orders and call down the raw materials from the supplier.

### III. Model

#### Review of knowledge

Focusing our analysis to a food multinational firm similar to the one presented above, we start by giving a definition for the multinational firm (MNE) as an enterprise that controls and manages production establishments located in at least two countries<sup>16</sup> [Caves R., 1996]. A MNE usually chooses to hold only a fraction of the equity of a foreign affiliate. It is considered an ideal vehicle for spearheading industrial restructuring mainly through its ability to transfer technology and management skills and its spillover effects on local firms. For these to be accomplished in a transition economy more liberal investment policies and generous incentives programs are required, as well as a sustainable economic and social environment. In other words, even if MNEs could significantly contribute into the development of transition economies, it is their governments' responsibility to promote their welfare by setting the appropriate institutional and attitudinal framework [Artisien P. *et al* (eds), 1993].

As mentioned in the previous section, CEECs are now using a range of incentives programs to attract inward FDI. Debate about the theoretical rationale for these incentives has identified market failures or externalities (ex. spillover effects) as reasons why FDI may produce positive welfare effects for both the home and host countries. Empirical research on the effects of FDI is yet mixed, since they seem to depend on the type (greenfield vs. takeover) and motive of investment (market seeking vs. export platform), as well as host country characteristics such as conditions of local firms.

The food MNEs in CEECs initially had to face problems such as administrative and political barriers, economic uncertainty, technological barriers and lack of interest by downstream enterprises; all of which were overcome through economic reintegration [Gorton M., 1997]. The majority of these food-MNEs were not new ventures. The investors preferred to establish foreign subsidiaries rather than entering by a greenfield investment (also because of 'indigenization requirements'<sup>17</sup>). That is because the choice of mode of entry depends on risks and co-ordination costs. Investment in a subsidiary is accompanied by costs related to corporate control in an already established firm, while a greenfield investment includes a high start-up cost. In general, a subsidiary gives a lower but less uncertain expected rate of return. The

---

<sup>16</sup> There is a parent enterprise that has a direct investment enterprise operating in a country other than that of the parent enterprise; and there is an affiliate enterprise such as a subsidiary, in which the foreign investor has an effective voice in management (for detailed definitions, see World Investment Directory, 2003, p. 66-68).

<sup>17</sup> The host government requires a foreign investor to share ownership of an affiliate with investors in the host country.

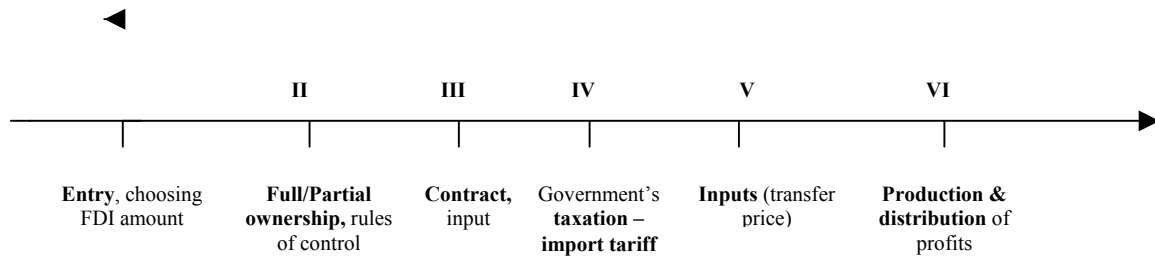
competitive effect of the two methods of entry also differs, since a greenfield entry adds a new enterprise to the national market, whereas entry by a subsidiary does not. It is then obvious why both the foreign investors and the governments' of transition economies preferred the latter case rather than greenfield investments.

Despite these, foreign investors contributed significantly in restructuring the food industry and in increasing its competitiveness. The increased level of technical and managerial efficiency of former state-owned enterprises and the improved local markets with new products and better marketing managed to link agricultural producers to food industries and thus, to increase vertical integration and to improve their financial position.

In this framework, the parent firm of the food multinational industry of our interest invests in an already existing firm in a transition economy, holding a fraction of the equity. At the beginning of transition, it is the parent firm that specifies the supplier of inputs necessary for the affiliate's production. The parent firm signs a contract with the supplier who is located in a country other than the one of the affiliate firm. The affiliate firm decides the amount of input that is imported from the foreign supplier, while the latter sends the requested input at a particular delivered price – transfer price (phase one). On the other hand, the government of the host country affects the decisions of all three firms through its policies – taxation and import tariff. As the affiliate becomes mature and obtains partial autonomy, it tends to import less, either because the local market increased enough, or because it is now possible to find skilled labour or worthwhile suppliers locally, or even because cost price or tariffs barriers evolution make this solution more viable. Thus, the production choices do not rely completely on the specification of suppliers by the parent company. There is even the case where the affiliate firm is able to produce its own inputs and the parent company becomes only a financial actor (phase two onwards). In general, the parent company keeps, at the home country only headquarters or R&D activities, while the affiliate finds other sources of inputs supply which are more attractive and in consistence with their profit maximisation objective. This is consistent with the so-called home market effect - similarly to notion of forward and backward linkages.

### **Problem Definition - Methodology**

A Stackelberg equilibrium analysis of a non-cooperative game will be illustrated in this section. A simple dynamic game of complete but imperfect information is developed based on the following six successive stages:



In Stage I, a parent firm considers whether to establish an affiliate in a host country, by choosing the amount of the foreign direct investment (K). That is the choice between exporting and a subsidiary. Assuming that the use of a local firm through direct investment is the desirable mode of entry, the parent company decides to invest. This is supported by the relatively large size of markets in transition economies of CEE and the continuously decreased risk in expected profits. Once the affiliate is set up, the host government has an incentive to confiscate profits from this investment. As a result, future earnings repatriation may not be possible and the multinational is not practically encouraged for further investments; the so-called 'hold-up problem'. For this to be avoided, the multinational company decides whether to own the affiliate fully or to sell a fraction to investors of the host country (Stage II). Assuming also that the affiliate is set up at the beginning of the transition period, then the foreign investors do not prefer to create a wholly-owned affiliate, or more possibly this is not allowed due to 'indigenization requirements'. Thus, rules of control are imposed and a fraction  $\gamma \in [\chi, \psi] \leq [0, 1]$  belongs to local investors.

In Stage III and IV, the parent company chooses the supplier of the raw materials – input and signs a contract with him and the host country's government chooses both a trade and an industrial policy, respectively. There are then linkages in production that follow from the fact that the parent firm specifies the raw materials to the affiliate and the foreign supplier provides them at a constant per unit production cost  $c$ ; influencing in this way the welfare effects of multinational activity. This is also assumed to be affected by the fact that there is a probability the foreign supplier to sell the input at a price different than the production cost. This 'transfer price' can be either higher or lower than the real cost. On the other hand, the host government taxes and regulates FDI. The instrument considered for trade policy is an import tariff,  $t$ , while industrial policy is implemented through taxes,  $T$ . The affiliate firm has now the right to choose the amount of input imported, based on the contract signed between the parent company and the foreign. Here, our analysis will be extended for two different types of contracts, non-binding vs. binding, trying to justify which can be the optimal choice.

As mentioned already, a two-stage dynamic game of complete but imperfect information will be developed; assuming that moves occur in sequence for each stage, while simultaneous moves

are allowed within stages, all previous moves are observed before the next move is chosen, and the players' payoffs from each feasible combination of moves are common knowledge. A Stackelberg equilibrium will then be developed, considering a game with the following three players: the affiliate firm, the foreign supplier and the government of the host country. Suppose that the government plays as the Stackelberg leader (dominant player) and the two firms play as Stackelberg followers (subordinate players), then, a Stackelberg equilibrium is obtained if the Stackelberg leader can commit himself to an action before the other players<sup>18</sup>. The Stackelberg followers choose their best actions after observing the leader's action. The Stackelberg equilibrium is, therefore, solved in two Stages, Stage IV and V. The government decides the amount for  $(t, T)$ , the parent firm reacts using the amount of input requested by the foreign supplier, while the latter reacts using the transfer price for the imported input. The game will be solved by an approach in the spirit of backwards induction, but this time the first step in working backwards from the end of the game involves solving a real game rather than solving a single-firm optimization problem, for a Nash equilibrium to be achieved between the affiliate firm and the supplier. In the next Stage, production and distribution of profits take place by the affiliate company for both phases of our game and for both types of contracts.

We already pointed out that, apart from the government's decision on the amount of import tariff,  $t$ , it also applies an 'income' tax on the profits of the subsidiary at the rate  $\rho$ . The government assess a rate of profit  $m$  on sales that would be the normal experience of the food industry. The expected taxes paid to the host country are  $T = \rho m \bar{Q}$ , where  $\bar{Q}$  is the amount of production of the affiliate. We let  $\tau = \rho m$  denote the 'effective tax rate' on sales, thus, the host country's income tax becomes  $T = \tau \bar{Q}$ .

The following general assumptions are made:

- Investment  $K$  is observable and irreversible.
- Fraction  $\gamma \in [\chi, \psi] \leq [0, 1]$ , where  $\chi, \psi$  are exogenous limits.
- In inputs transactions, the parent and the supply firm agree to exchange the input at the delivered price  $\theta$ .
- The production function of the affiliate has the following simple form:

$$\bar{Q} = \alpha x - \frac{\beta}{2} x^2 \quad (1), \text{ for } \alpha > \beta > 0 \text{ and } \bar{Q} = 0, \text{ otherwise.}$$

- Each firm has a constant per unit production cost  $c$  and the affiliate's and supplier's firms profit are given respectively by:

---

<sup>18</sup> The leader commits himself to an action before the followers knowing all the parameters of the game, the leader can predict the responses of the followers; this knowledge is used in deciding his own action.



$\pi = \gamma \left( \bar{Q} - \theta x - T \right)$  (2), for the affiliate firm and  $\Pi = (\theta - c)x - tx$  (3), for the supply firm.

- The government's objective function is:

$$\Phi = T + tx + v\gamma E \left[ \left( 1 - \tau \right) \left( \alpha x - \frac{\beta}{2} x^2 \right) - \theta x \right] \quad (4),$$

where  $v$  is the weight attributed to resident incomes,  $v \in [0, 1]$ . If the government is Leviathan  $v = 0$ . If it is fully generous, then  $v = 1/(1+\sigma)$ ; where  $\sigma$  is the marginal excess burden of the marginal source of government's revenues.

Assuming that  $K$  and  $\gamma$  are given, we consider the subgame consisting of stages III-VI. It is obvious from the profits equations of both firms that the government's optimal tax and tariff rates affect the production decisions, the transfer price, and the optimal contract chosen by the multinational. The government can observe costs and knows the production function of the firm. It cannot determine the contract parameters. That is usually considered as efficiency losses, because of the firms' incentive to arbitrage in international profit taxes.

## The Game

### Binding vs. non-binding contract

Because firms, by definition, engage in long-term transactions, no firm can entirely avoid making contractual commitments. Vertical contracts can be technology-transfer agreements, franchise contracts and input-supply arrangements. We focus on the last one. Either a 'two-phase' binding contract can be signed, under which the affiliate firm is not allowed to buy input from a firm other than the foreign supplier specified by the parent firm, or a 'two-phase' non-binding contract, under which the affiliate firm is allowed to choose other suppliers upon 'maximum profit conditions'. The crucial point is that the affiliate decides the amount of input's quantity, while the revenues repatriated in the home country depends on the profitability of the firm in the host country and the delivered price imposed to imported inputs by the foreign supplier.

Specifically, under a non-binding contract, in the first phase, the supply and affiliate firms get  $\Pi_1$  and  $\pi_1$ , respectively. In the second phase, if no inputs are imported anymore, the respective firms get  $\Pi_2$  and  $\pi_2$ , otherwise; the supply and affiliate firms get  $\Pi_1$  and  $\pi_1$ , as in the first phase, respectively. For a binding contract, on the contrary, in the first phase, the respective firms get similar to the first case  $\Pi_1$  and  $\pi_1$ ; and in the second phase, regardless of whether the use of

inputs from local suppliers is more profitable, or not, the firms get again  $\Pi_1$  and  $\pi_1$ , respectively (see Table below).

Supply / Affiliate firm	1 <sup>st</sup> Phase	2 <sup>nd</sup> Phase
<b>Non-Binding</b>	$\Pi_1 = (\theta - c)x - tx ,$ $\pi_1 = \gamma \left( \bar{Q} - \theta x - T \right)$	<u>No inputs:</u> $\Pi_2 = 0 ,$ $\pi_2 = \gamma \left( \bar{Q} - T \right)$ <u>Inputs:</u> $\Pi_1 = (\theta - c)x - tx ,$ $\pi_1 = \gamma \left( \bar{Q} - \theta x - T \right)$
<b>Binding</b>	$\Pi_1 = (\theta - c)x - tx ,$ $\pi_1 = \gamma \left( \bar{Q} - \theta x - T \right)$	$\Pi_1 = (\theta - c)x - tx ,$ $\pi_1 = \gamma \left( \bar{Q} - \theta x - T \right)$

The difference between binding and non-binding contracts lies in the firms' second-phase payoffs. Under the binding contract, the supply firm always gets  $\Pi_1$ , but, under the non-binding contract, the foreign firm gets  $\Pi_1$  only when it keeps exporting inputs in the second phase as well.

### Non-binding contract

#### *2nd Phase - No inputs*

The affiliate firm will choose to work with local suppliers to capture revenue spent for inputs from the foreign supplier. Then, maximum profits for the affiliate are:

$$\pi_2 = \gamma(1 - \tau) \left[ \alpha x - \frac{\beta}{2} x^2 \right] \quad (5)$$

Setting the first-order condition equal to zero, we get:  $x^* = \frac{\alpha}{\beta}$  (6) and  $\pi^* = \frac{\alpha^2 \gamma(1 - \tau)}{2\beta}$  (7).

#### *2nd Phase - Inputs*

If no autonomy is achieved and the affiliate firm is not allowed to use local raw materials, it may be beneficial for both firms to continue the cooperation in the second phase. Given the delivered price  $\theta$ , the affiliate firm chooses the amount of input to maximize the following second-period profit-function:

$$\pi_1 = \gamma \left[ (1 - \tau) \left( \alpha x - \frac{\beta}{2} x^2 \right) - \theta x \right] \quad (8)$$

Setting the first-order condition equal to zero, we get the solution:  $x' = \frac{\alpha}{\beta} + \frac{\theta}{\beta(\tau-1)}$  (9)

and  $\pi' = -\frac{\gamma[\theta + \alpha(\tau-1)]^2}{2\beta(\tau-1)}$  (10), for  $\beta \neq 0$  and  $\tau \neq 1$ .

From (9) it appears that the optimal choice of  $x$  is at the point where the benefit to the affiliate of a marginal unit of  $x$  equals the marginal cost of  $x$ ,  $\theta$ . This implies that demand for the input by the affiliate is inversely related to the delivered price and the tax rate of the host government. Note that the marginal product of  $x$  is only positive if the transfer price is positive.

On the other hand, the foreign supplier's expected profit, given the amount of input demanded from the affiliate firm, is:

$$\Pi_1 = (\theta - c)x - tx \quad (11)$$

The foreign supplier will provide the amount of inputs requested above if and only if  $\theta$  is equal

to:  $\theta' = \frac{1}{2}(c + t + \alpha - \alpha\tau)$  (12) and  $\Pi' = -\frac{[c + t + \alpha(\tau-1)]^2}{4\beta(\tau-1)}$  (13).

The subgame perfect Nash equilibrium for equations (9)-(10) and (12)-(13) will then be:

$$\hat{x} = \frac{\alpha}{2\beta} + \frac{c+t}{2\beta(\tau-1)} \quad (14); \quad \hat{\pi} = -\frac{\gamma[c + t + \alpha(\tau-1)]^2}{8\beta(\tau-1)} \quad (15); \quad \hat{\theta} = \frac{1}{2}(c + t + \alpha - \alpha\tau) \quad (16) \quad \text{and}$$

$$\hat{\Pi} = -\frac{[c + t + \alpha(\tau-1)]^2}{4\beta(\tau-1)} \quad (17), \quad \text{for } \beta \neq 0 \text{ and } \tau \neq 1. \quad \text{The affiliate firm and the foreign supplier}$$

choose respectively the amount of input and the delivered price non-cooperatively and simultaneously, while their decisions depend critically on the conditions that  $\tau < 1$ ,  $\alpha(\tau-1) > c + t$ ,  $\beta \neq 0$  and  $\tau \neq 1$ . When these are satisfied, supplier has the incentive to provide the requested amount of input to the affiliate firm and the latter to ask this particular input. When the conditions are not satisfied, no trade among the two firms will occur.

### *1<sup>st</sup>-Phase*

In the 1st period, the foreign supplier and the affiliate firm again make their decisions simultaneously. Specifically, given the foreign supplier's delivered price  $\theta$ , the affiliate firm maximises total profit, choosing the amount of inputs, given by the following equation:

$$\bar{\pi}_1 = \gamma \left( \bar{Q} - \theta x - T \right) + \delta(\pi_1 + \pi_2) = \frac{1}{2} x \gamma \left[ -2(1 + \delta)\theta - 2\alpha(1 + 2\delta)(\tau - 1) + x\beta(1 + 2\delta)(\tau - 1) \right] \quad (18)$$

where  $\delta$  is the discount factor and equals to  $\delta = \frac{1-p}{1+r}$ , while  $p$  is the probability that the game ends immediately,  $(1-p)$  that the game continues for at least one more stage, and  $r$  is the interest rate per stage.

That gives:  $x'' = \frac{\alpha}{\beta} + \frac{\theta(1+\delta)}{\beta(1+2\delta)(\tau-1)}$  (19) and  $\pi'' = -\frac{\gamma[\theta(1+\delta) + \alpha(1+2\delta)(\tau-1)]^2}{2\beta(1+2\delta)(\tau-1)}$  (20), for  $\beta$

$\neq 0$ ,  $\delta \neq -1/2$  and  $\tau \neq 1$ .

On the other hand, given the affiliate firm's demand for inputs, the foreign supplier has expected total profits:

$$\bar{\Pi}_1 = (\theta - c)x - tx + \delta\Pi_1 = (1+\delta)[(\theta - c)x - tx] \quad (21)$$

which is the foreign firm's expected profit in the first period and its profit in the second period if the local firm is still importing inputs. Based on the input requested in (19), the foreign supplier will provide the goods if and only if the delivered price is equal to:

$$\tilde{\theta} = \frac{1}{2(1+\delta)}[(1+\delta)(c+t) + (1+2\delta)(\alpha - \alpha\tau)] \quad (22) \text{ for } \delta \neq -1$$

$$\text{and } \tilde{\Pi} = -\frac{[(c+t)(1+\delta) + \alpha(\tau-1)(1+2\delta)]^2}{4\beta(1+2\delta)(\tau-1)} \quad (23), \text{ for } \beta \neq 0, \delta \neq -1/2 \text{ and } \tau \neq 1.$$

The subgame perfect Nash equilibrium for equations (19)-(20) and (22)-(23) will then be:

$$\tilde{x} = \frac{\alpha}{2\beta} + \frac{(c+t)(1+\delta)}{2\beta(1+2\delta)(\tau-1)} \quad (24); \quad \tilde{\pi} = -\frac{\gamma[(c+t)(1+\delta) + \alpha(1+2\delta)(\tau-1)]^2}{8\beta(1+2\delta)(\tau-1)} \quad (25);$$

$$\tilde{\theta} = \frac{1}{2(1+\delta)}[(1+\delta)(c+t) + (1+2\delta)(\alpha - \alpha\tau)] \quad (26); \text{ and } \tilde{\Pi} = -\frac{[(c+t)(1+\delta) + \alpha(\tau-1)(1+2\delta)]^2}{4\beta(1+2\delta)(\tau-1)}$$

(27), for  $\tau < 1$ ,  $\alpha(\tau-1) > c+t$ ,  $\beta \neq 0$ ,  $\delta \neq -1/2$ ,  $\delta \neq -1$  and  $\tau \neq 1$ . When conditions do not hold, neither firm has the incentive to cooperate in the first period. However, the two firms may still cooperate in the second period as specified above. Thus, the firms' total profits are not necessarily zero.

### Contract design

We now analyse the design of the contract between the parent firm and the foreign supplier. The parent firm is interested in the maximum of profits of the affiliate firm – more profits the affiliate more profits will be repatriated to the parent firm, since its profit function is given by:

$$\Psi = (1-\gamma)\left[(1-\tau)\left(\alpha x - \frac{\beta}{2}x^2\right) - \theta x\right] \quad (28).$$

*Lemma 1:* Under the conditions which imply subgame perfect Nash equilibrium decisions in the first and second phase of equations (14)-(17) and (24)-(27), there exists an equilibrium non-binding share contract with profits as in (25) and (27).

Under the equilibrium non-binding contract, the foreign supplier extracts larger profits in the first period to compensate for its expected second period loss from the fact that the affiliate firm is allowed to use local suppliers.

## **Binding contract**

### *2nd Phase - Inputs*

We will now derive the equilibrium for a binding contract. In the second phase, if the affiliate firm has obtained its autonomy, then inputs come from local suppliers. However, as the contract is binding, the firm keeps importing inputs from the foreign supplier. The affiliate then solves as for  $\pi_1$  in equation (8), getting the same results as in equations (9) and (10).

The same for the foreign firm that maximises its second-phase profit function as for  $\Pi_1$  in equation (11), with results similar to equations (12) and (13). Thus, the same conditions stand as for the subgame perfect Nash equilibrium described in equations (14)-(17).

### *1<sup>st</sup>-Phase - Inputs*

In the first-phase, the affiliate firm maximises its total profit given by:

$$\hat{\pi}_1 = \gamma \left( \bar{Q} - \theta x - T \right) + \delta(\pi_1) = \frac{1}{2} x (-2\theta(1+\gamma) + (-2\alpha\gamma + x\beta\gamma)(1+\delta)(\tau-1)) \quad (29)$$

From this, we get:  $x''' = \frac{\alpha}{\beta} + \frac{\theta(1+\gamma)}{\beta\gamma(1+\delta)(\tau-1)}$  (30) and  $\pi''' = -\frac{[\theta + \gamma(\theta + \alpha(1+\delta)(\tau-1))]^2}{2\beta\gamma(1+\delta)(\tau-1)}$  (31),

for  $\beta \neq 0, \delta \neq -1, \tau \neq 1, \gamma \neq 0, \theta \neq 0, \theta \neq \frac{(1+\delta)(\alpha\gamma - \alpha\gamma\tau)}{(1+\gamma)}$  and  $\theta \neq -\frac{(1+\delta)(\alpha\gamma - \alpha\gamma\tau)}{(1+\gamma)}$ .

On the other hand, the foreign firm has expected total profit given by:

$$\hat{\Pi}_1 = (\theta - c)x - tx + \delta(\Pi_1) \quad (32)$$

Based on the amount of input specified in (30), the firm will provide this to the affiliate if and only if the delivered price is equal to:  $\ddot{\theta} = \frac{t + c(1+\gamma) + \gamma(t - \alpha(1+\delta)(\tau-1))}{2(1+\gamma)}$  (33)

and  $\ddot{\Pi} = -\frac{[t + c(1+\gamma) + \gamma(t - \alpha(1+\delta)(\tau-1))]^2}{4\beta\gamma(1+\gamma)(\tau-1)}$  (34), for  $\beta \neq 0, \gamma \neq -1, \gamma \neq 0$  and  $\tau \neq 1$ .

The subgame perfect Nash equilibrium for equations (30)-(31) and (33)-(34) will then be:

$$\ddot{x} = \frac{\alpha}{2\beta} + \frac{(c+t)(1+\gamma)}{2\beta\gamma(1+\delta)(\tau-1)} \quad (35); \quad \ddot{\pi} = -\frac{[t + c(1+\gamma) + \gamma(t - \alpha(1+\delta)(\tau-1))]^2}{8\beta\gamma(1+\delta)(\tau-1)} \quad (36);$$

$$\ddot{\theta} = \frac{t + c(1+\gamma) + \gamma(t - \alpha(1+\delta)(\tau-1))}{2(1+\gamma)} \quad (37); \quad \ddot{\Pi} = -\frac{[t + c(1+\gamma) + \gamma(t - \alpha(1+\delta)(\tau-1))]^2}{4\beta\gamma(1+\gamma)(\tau-1)} \quad (38) \text{ for}$$

all conditions presented above and  $\tau < 1, \alpha(\tau-1) > c+t$ . When conditions do not hold, there will be no cooperation in either the first or the second phase.

## **Contract design**

We now analyse the design of the contract between the parent firm and the foreign supplier similar to the previous analysis.

*Lemma 2:* Under the conditions which imply subgame perfect Nash equilibrium decisions in the first and second phase of equations (14)-(17) and (35)-(38), there exists an equilibrium binding contract with profits as in (15) and (17); (36) and (38).

### **One-period contract**

In the case where the firms decide to have a one-period contract, for the first phase a Nash equilibrium is once again described by equations (14)-(17) under the same conditions. For the second phase, a one period contract is based on the following Nash equilibrium:

$$\tilde{x} = \frac{\alpha}{2\beta} + \frac{(c+t)}{2\beta(1+\delta)(\tau-1)} \quad (39); \quad \tilde{\pi} = -\frac{\gamma[(c+t) + \alpha(1+\delta)(\tau-1)]^2}{8\beta(1+\delta)(\tau-1)} \quad (40);$$

$$\tilde{\theta} = \frac{1}{2}[(c+t) + (1+\delta)(\alpha - \alpha\tau)] \quad (41); \quad \text{and} \quad \tilde{\Pi} = -\frac{[(c+t) + \alpha(\tau-1)(1+\delta)]^2}{4\beta(\tau-1)} \quad (42), \quad \text{for } \tau < 1,$$

$\alpha(\tau-1)c + t$ ,  $\beta \neq 0$ ,  $\delta \neq -1$  and  $\tau \neq 1$ .

We show that the equilibrium non-binding contract is preferred by both players to the equilibrium binding contract. The one-period contract for the first phase also seems to be the dominant contract. On balance, both firms are better off under the non-binding contract. We also find that, under the trade liberalization  $t=0$ , firms cooperate in a more efficient manner.

### **Stackelberg equilibrium**

Now that we have specified the market equilibrium for the firms, we can derive the optimal policies for the host government. The choice of the objective for the government decision-making is important to the analysis. To solve for the Stackelberg equilibrium, the first step was to find the firms' responses to any choices of import tariff,  $t$ , or tax rate,  $T$ , by the government.

The host country's total welfare is the sum of consumer surplus, tax and tariff revenue, and domestic profits. Thus, the government is trying to maximize the following function:

$$\Omega = \frac{1}{2}\tilde{Q}^2 + T + tx + \pi^0 \quad (43), \quad \text{where } \pi^0 \text{ is the respective profits of the affiliate firm. Analysing}$$

the case of the dominant contract, the following results are derived:

$$g_t = \frac{1}{32\beta^2(\tau-1)^4} \left[ \begin{aligned} &c^3 + t^3 - 3 + 2\alpha(\tau-1) + 3c^2(t + \alpha - \alpha\tau) - t(\tau-1)^2(\alpha^2 + 8\beta(4 - \gamma + \\ &(\gamma - 3)\tau)) + \alpha(\tau-1)^3(3\alpha^2 + 8\beta(-2 + \gamma + 3\tau - \gamma\tau)) + c(3t^2 - 6t\alpha(\tau-1) \\ & - (\tau-1)^2(\alpha^2 + 8\beta(2 - (\gamma-1)\tau))) \end{aligned} \right] \quad (44)$$

$$g_{\tau} = \frac{1}{32\beta^2(\tau-1)^5} \left[ \begin{aligned} & -c^4 + c^3(4t + 3\alpha(\tau-1)) + c^2(-6t^2 + 9t\alpha(\tau-1) + (\tau-1)^2(\alpha^2 + 4\beta(1 + \gamma(\tau-1) \\ & + \tau))) - (t + \alpha - \alpha\tau)(t^3 - 2t^2\alpha(\tau-1) - 4\alpha\beta(\gamma-3)(\tau-1)^4 - t(\tau-1)^2(3\alpha^2 + 4\beta \\ & (5 - \gamma + (\gamma-3)\tau))) + c(-4t^3 + 9t^2\alpha(\tau-1) - \alpha(3\alpha^2 + 8\beta)(\tau-1)^3 + 2t(\tau-1)^2 \\ & (\alpha^2 + 4\beta(3 - \gamma + (\gamma-1)\tau))) \end{aligned} \right] \quad (45)$$

For the whole analysis, tax rate is constrained to be non-negative and  $\tau < 1$  so as to prevent tax rates that confiscate output from the affiliate.

#### IV. Conclusion

To conclude, since the beginning of transition, foreign direct investments are a dynamic area of economic relations between EU-15 and CEECs. Flows in both directions are playing a major role in the integration of these transition economies into the world economy. Such developments should be recognised as the growing internationalisation of production and services in the EU-15 and CEE context and the extension of multinational operations to their relations in both directions. But because transnational ownership links can affect the competitiveness of markets, the multinationals' competitive behaviour raises issues of public policy, thus competition policy and national welfare.

Under this investigation, we summarize that foreign investment can contribute to the structural transformation of the CEE economies by raising productivity and efficiency in such a way as to create a basis for the future integration of their productive capacity in the international economy. As a small nucleus in the economies of CEE, FDI can generate spill-over effects far in excess of its own magnitude.

Contract enforcement was not a prerequisite for FDI in CEE countries, especially in the early stage of their transition. The finding sheds light on the puzzle that there has been substantial FDI in the food industry of CEE, even at the beginning of 1990s when contract enforcement was not well developed in this sector. It may also explain why investors preferred joint ventures (minimum percentage of ownership) at the early stage of the countries' economic reform. However, we stress that our conclusions depend crucially on some important stylised facts of the food industry. We consider a scenario in which foreign investors prefer to invest in subsidiaries rather than greenfield investments, because of the information that the local firms can provide related to local market, the associated lower cost and time requested (be the first comers).

Finally, the food industries crucially lacked the resources necessary to modernise their physical assets and production processes. If restructuring had relied only on domestic capital, it would

have been a very protracted process on the whole. Therefore, the main impetus for the modernization of the food industry was bound to come from abroad, at least in the mid-term. In such circumstances, whether government policies were FDI friendly or more or less reluctant to encourage foreign participation would be likely to have a strong impact on the performance of the sector. Contrary to the expectations of many observers, based on the bad performance of the food industry, the food sector has actually attracted significant amount of FDI and in some transition economies, succeeded in being the favourite target of foreign investors.



## References

- Sergio Alessandrini (ed.), 2000, *The EU Foreign Direct Investments in Central and Eastern Europe*, Giuffrè
- Carlo Altomonte and Laura Resmini, 2001, *Multinational Corporations as Catalyst for Industrial Development: the Case of Poland*, Working Paper No. 368
- Patrick Artisien, Matija Rajec and Marjan Svetlicic (eds), 1993, *Foreign Investment in Central and Eastern Europe*, St Martins Press
- Aumann R.J. and S. Hart (eds), 1992, *Handbook of Game Theory with Economic Applications*, Vol. 1, Elsevier Science Publishers
- Pontus Braunerhjelm and Karolina Ekholm (eds), 1998, *The Geography of Multinational Firms*, Kluwer Academic publishers
- Caves E.R., 1996, *Multinational Enterprise and Economic Analysis*, 2<sup>nd</sup> edition, Cambridge University Press
- Dunning J.H., 1995, *Multinational Enterprises and the Global Economy*, Addison-Wesley Publishing Company
- Ramy Elitzur and Jack Mintz, 1996, Transfer Pricing Rules and Corporate Tax Competition, *Journal of Public Economics*, 60, 401-422
- Estrin S., K. Hughes and S. Todd, 1997, *Foreign Direct Investment in Central and Eastern Europe, Multinationals in Transition*, The Royal Institute of International Affairs
- Estrin S., X. Richet and J.C. Brada, 2000, *Foreign Direct Investment in Central Eastern Europe, Case Studies of Firms in Transition*, M.E. Sharpe, Inc.
- Gibbons R., 1992, *A primer in Game Theory*, Harvester Wheatsheaf
- Matthew Gorton, 1997, *The Food Industry in Central and Eastern Europe under Communism*, FAIR1-CT95-0029, Working Paper No. 2/1
- Edward Graham, 1998, Market Structure and the Multinational Enterprise: A Game-theoretic Approach, *Journal of International Business Studies*, 29, 67-83
- Ignatius Horstmann and James Markusen, 1987, Strategic Investments and the Development of Multinationals, *International Economic Review*, 28, No. 1, 109-121
- Kai Konrad and Kjell Erik Lommerud, 2001, Foreign Direct Investment, Intra-firm Trade and Ownership Structure, *European Economic Review*, 45, 475-494
- James Markusen, 2001, Contracts, Intellectual Property Rights, and Multinational Investment in Developing Countries, *Journal of International Economics*, 53, 189-204
- John McMillan, 1986, *Game Theory in International Economics*, Harwood Academic publishers

Jose Luis Moraga and Jean-Marie Viaene, 2000, Trade Policy of Transition Economies, Tinbergen Institute Discussion Paper TI2000-110/2

Jean-Louis Mucchielli and Isabelle Soubaya, 2001, Autonomy vs. Dependency of Foreign Affiliates, The Role of Intra-firm Trade for French Multinational Firms

Lars Oxelheim and Pervez Chauri (eds), 2004, European Union and the Race for Foreign Direct Investment in Europe, Elsevier Ltd

Jose Pedro Pontes, 2000, A Game Theoretic Model of Multinational Firm Location, paper presented at North American Meetings of the Regional Science Association International, Chicago, 10-11 November

Jose Pedro Pontes, 2001, A Geographic Game with Intermediate Goods, Working Paper of the Research Unit on Complexity in Economics (UECE)

Zhigang Tao and Sucheng Wang, 1998, Foreign Direct Investment and Contract Enforcement, Journal of Comparative Economics, 26, 761-782

Wolfram St., 1996, *The Mathematica Book*, 3<sup>rd</sup> Edition, Wolfram Media Inc. and Cambridge University Press

World Investment Directory, 2003, Vol VIII, Central and Eastern Europe, United Nations

## Annex

**Table 1**

### Inward FDI by host country and years (1989-1998)

Industry percentages over total FDI in the country

	AL	BL	CR	CZ	ES	HU	LV	LT	PL	RO	SK	SL	Total
Agriculture	13.6	1.2	0	0.6	0.7	1.6	0	1.6	0.7	1.2	0	0	1
Fishing	0	1.2	1.7	0	0	0	0	0	0	0	0	0	0.1
Mining and quarrying	9.1	1.2	0	1.9	0.7	1.8	0	0	1.1	2.4	0	0	1.5
Manufacturing	36.4	64.3	60.3	66.5	54.3	58.8	35.5	56.5	65.7	59	69	74.6	62.7
<b>Food</b>	<b>4.5</b>	<b>22.6</b>	<b>19</b>	<b>8.5</b>	<b>10.9</b>	<b>13.9</b>	<b>12.9</b>	<b>6.5</b>	<b>14.4</b>	<b>14.9</b>	<b>16.7</b>	<b>6.8</b>	<b>12.8</b>
Electricity, gas, water	0	2.4	1.7	5.1	1.4	5.6	6.5	0	0.8	0.4	0	1.7	2.9
Construction	0	0	1.7	4.2	1.4	4	3.2	4.8	3.6	6	1.2	3.4	3.7
Wholesale and retail	9.1	8.3	13.8	8.4	8	8.8	12.9	14.5	9.9	13.7	10.7	5.1	9.7
Hotels and restaurant	18.2	3.6	1.7	0.5	5.8	2.9	0	3.2	1.3	0.8	0	1.7	1.8
Financial intermediation	4.5	7.1	15.5	5.3	8	7.9	19.4	6.5	7.9	5.6	14.3	10.2	7.5
Health and social work	0	0	0	0	0	0	0	1.6	0	0	0	0	0
Other services	4.5	0	0	0.8	0.7	0.7	0	1.6	2	0.8	0	1.7	1.1

Source: Alessandrini (2000)

**Table 2**

### No of Foreign Affiliates

	1994-2000	Value added as %GDP in 1999	Employment % in 1999
Albania	2422	0.9	1.4
Bulgaria	918	1.7	5.4
Croatia	353	5.2	8.1
Czech Rep	71385	10.2	4.2
Estonia	3066	8.4	9.4
Hungary	28772	24	27.4
Latvia	107	5.5	10.4
Lithuania	1893	3.8	5.9
Poland	35840	6.6	3.5
Romania	71318	1.6	1.4
Slovakia	5560	4.4	3.6
Slovenia	1195	3.5	8.8

Source: World Investment Report, 2001, 2003

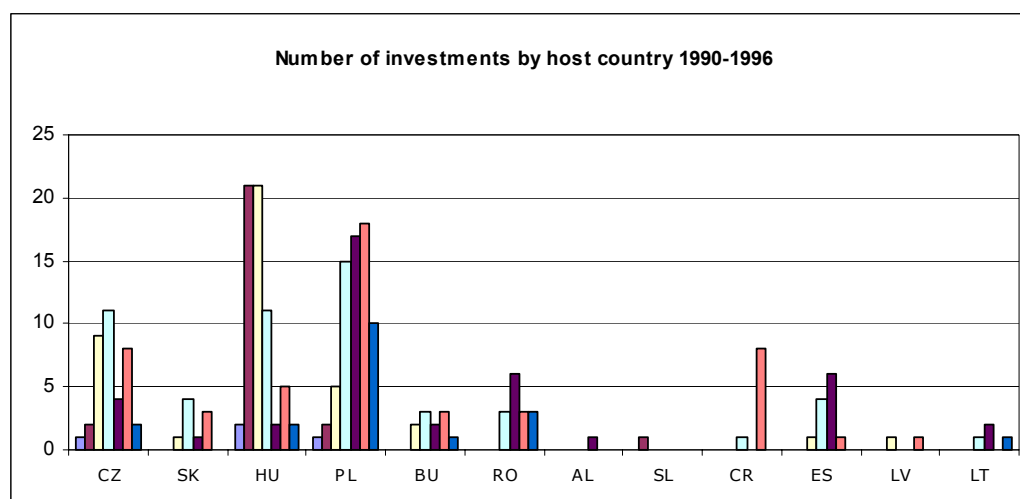
**Table 3**

**CEECs Trade Agreements**

	Europe Agreements	WTO	CEFTA	BAFTA
Bulgaria	March 1, 1993	December 1, 1996	January 1, 1999	-
Czech R.	October 6, 1993	January 1, 1995	December 21, 1992	-
Estonia	June 12, 1995	November 13, 1999	-	April 1, 1994
Hungary	December 16, 1991	January 1, 1995	December 21, 1992	-
Latvia	June 12, 1995	February 10, 1999	-	April 1, 1994
Lithuania	June 12, 1995	May 31, 2001	-	April 1, 1994
Poland	December 16, 1991	July 1, 1995	December 21, 1992	-
Romania	February 8, 1993	January 1, 1995	July 1, 1997	-
Slovakia	Ocrober 6, 1993	January 1, 1995	December 21, 1992	-
Slovenia	June 10, 1996	July 30, 1995	January 1, 1996	-

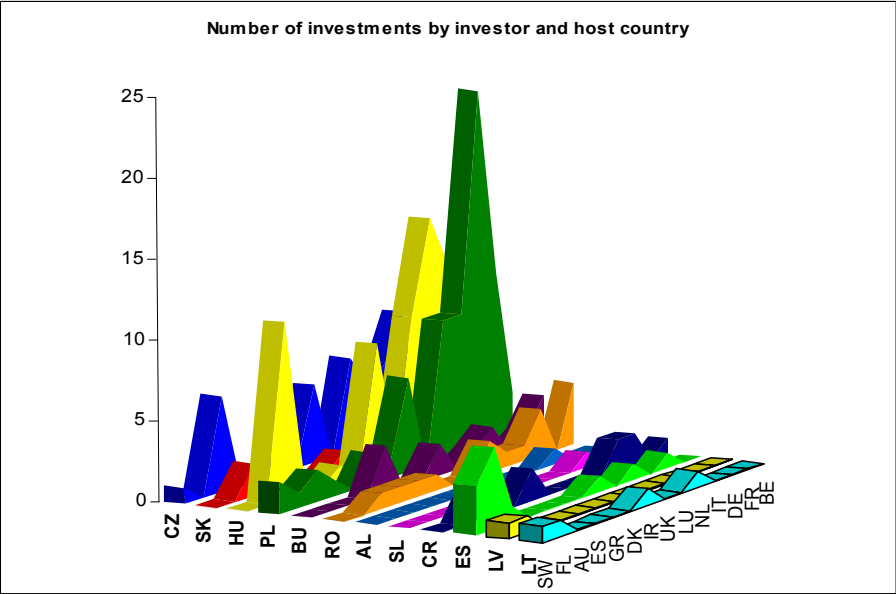
**Data on Food and Beverages in CEE**

**Figure 1**



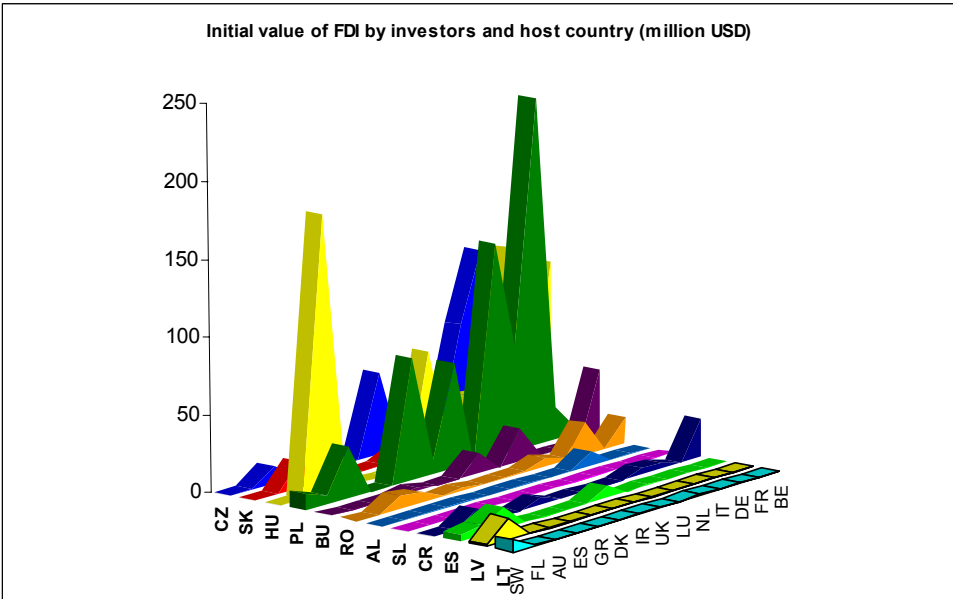
Source: Alessandrini (2000)

Figure 2



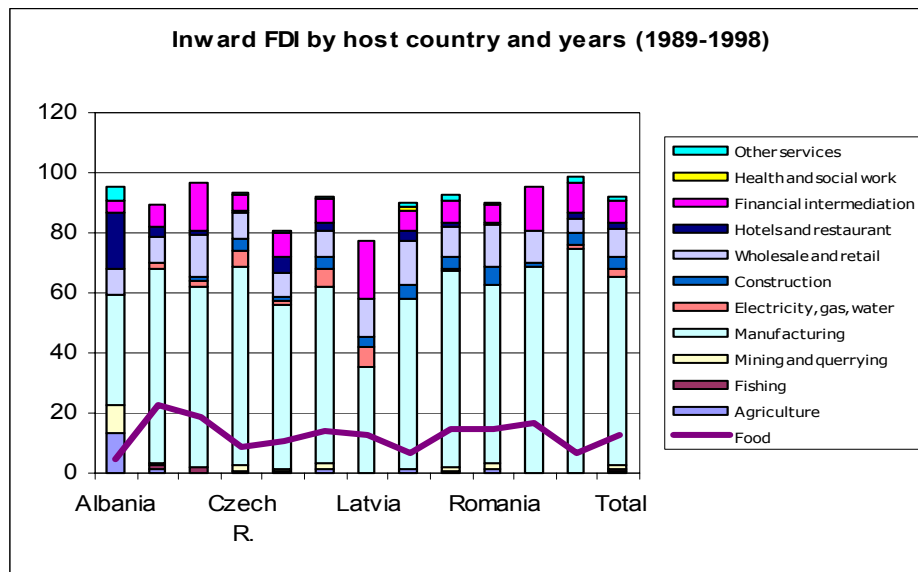
Source: Alessandrini (2000)

Figure 3



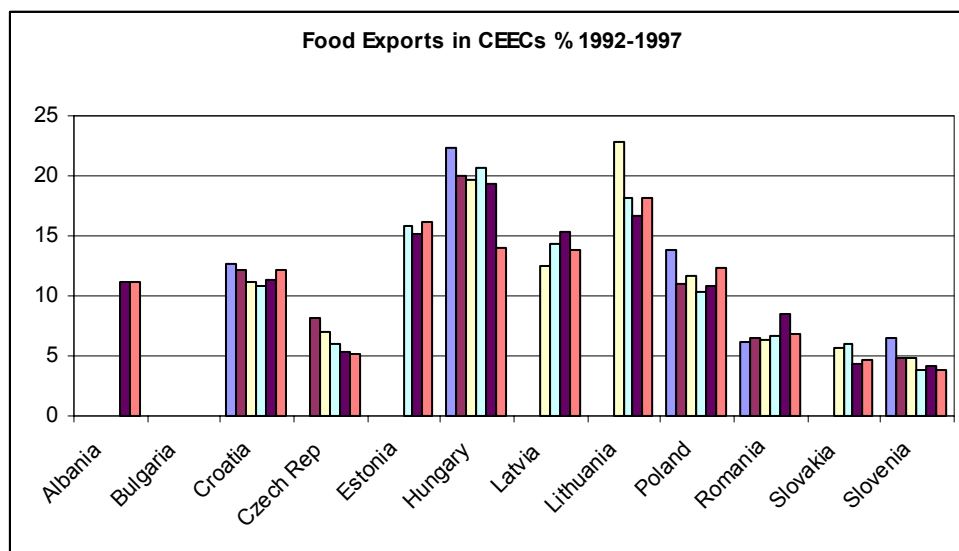
Source: Alessandrini (2000)

**Figure 4**



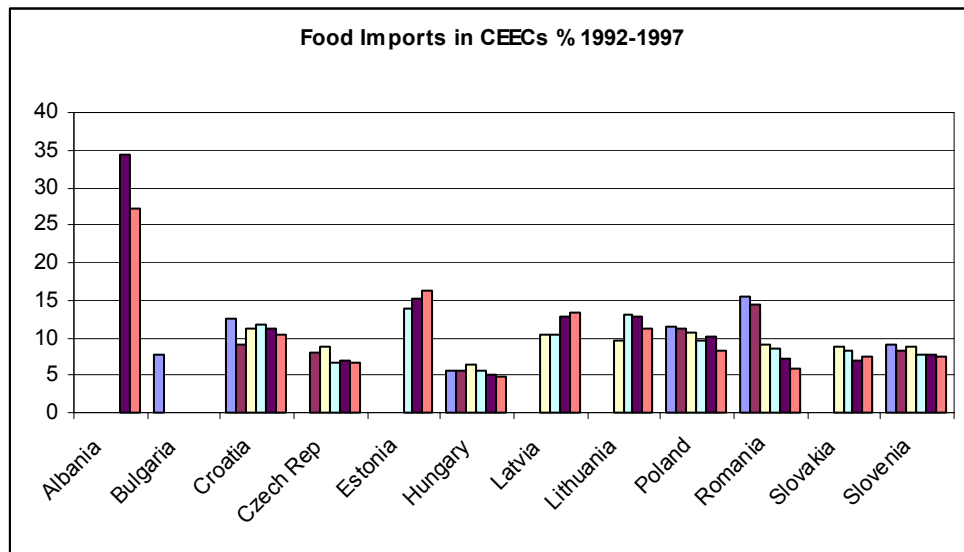
Source: Alessandrini (2000)

**Figure 5**



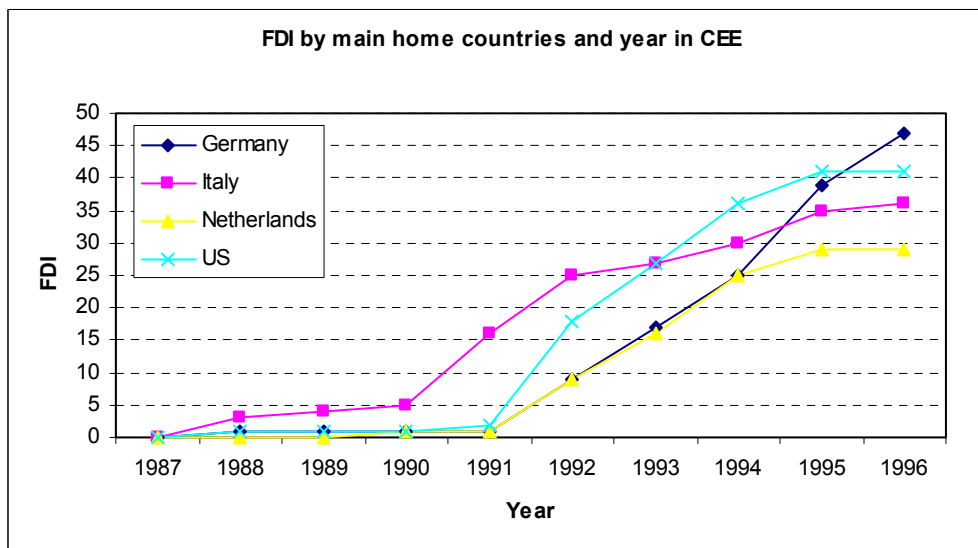
Source: The World Bank, World Development Indicators (1999)

**Figure 6**



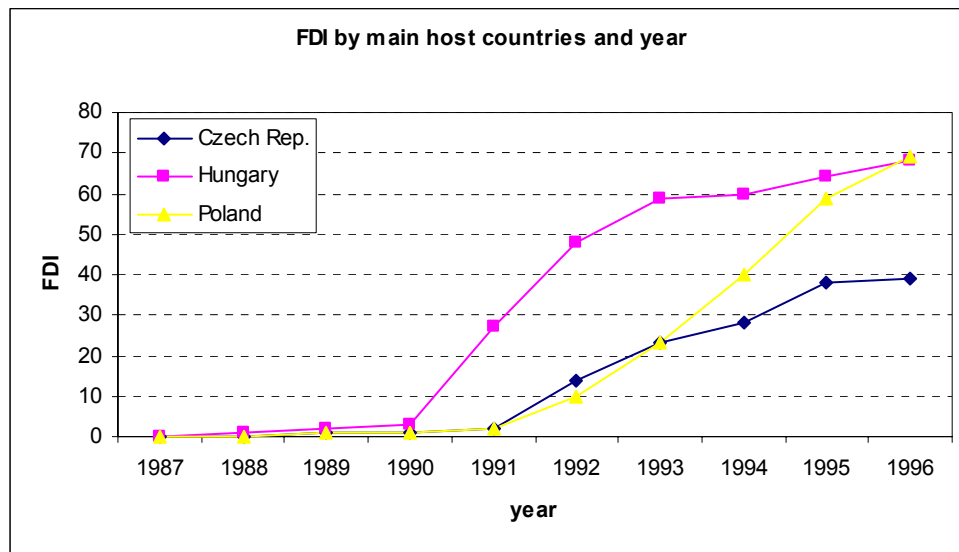
Source: The World Bank, World Development Indicators (1999)

**Figure 7**



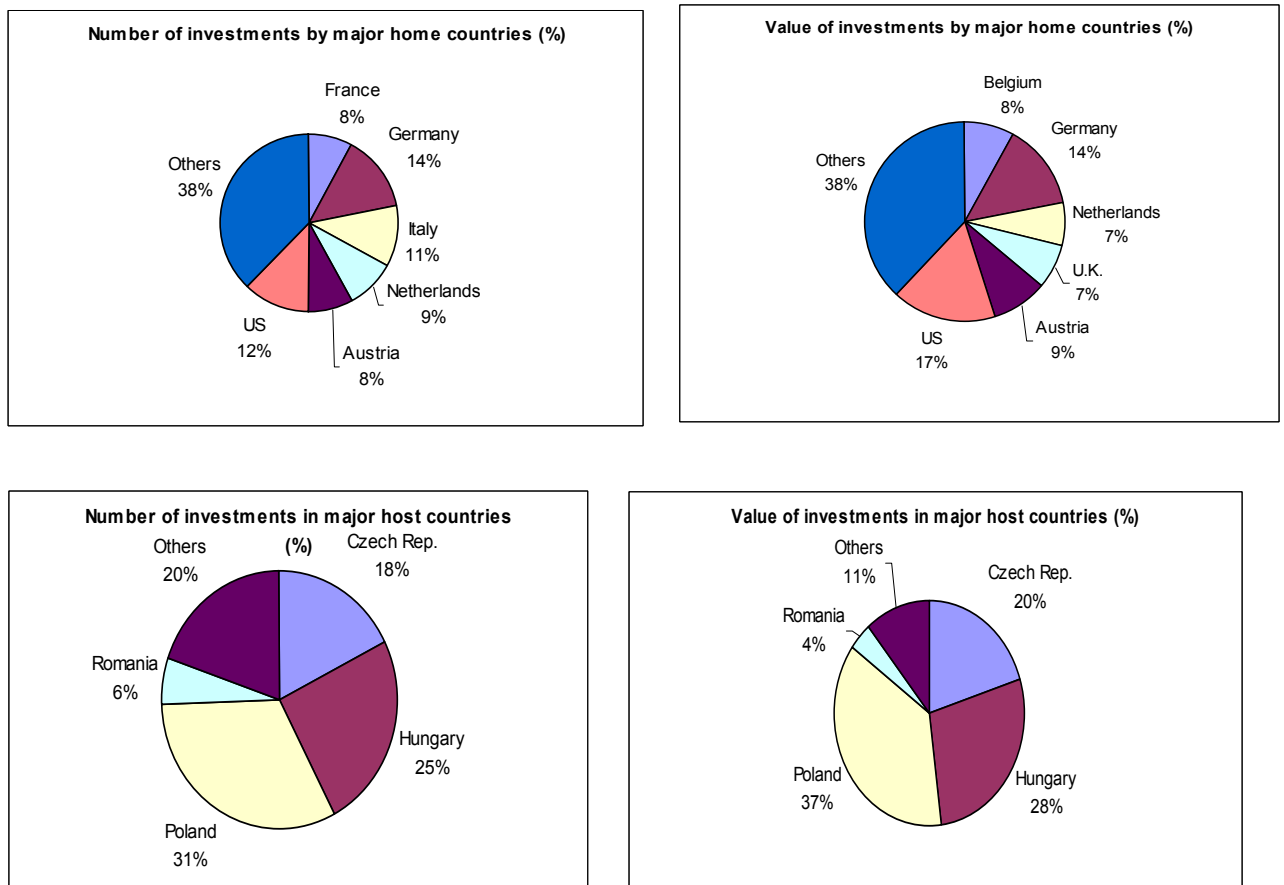
Source: Alessandrini (2000)

**Figure 8**



Source: Alessandrini (2000)

**Figure 9**



Source: Alessandrini (2000)



**Table 4****Largest Foreign Investors in Food & Beverages Sector (2000)**

Investor	Host country	Origin	App. Equity & loans \$million	Activities
Coca-Cola Hellenic Bottling Co	Poland	US/Greece	500	Soft drinks
Nestlé	Poland	Switzerland	348	Food proces.
Coca-Cola	Hungary	US and other	300	Soft drinks
Pepsi Co	Hungary	US	160	Soft drinks
Feruzzi	Hungary	Italy	160	Food
Unilever	Czech Rep.	Netherl./UK	100	Various
Sara Lee/Douwe Egberts	Hungary	US	100	Food proces.
Unilever	Hungary	Netherl./UK	100	Food

Source: Euromonitor International

**Table 5****Major foreign investors**

Foreign Investor	Country of origin	Host country	Local Partner	Type of business	Year	Initial investment (USD million)
Unilever NV	Netherlands, UK	Hungary	Bajai Hutoipari Rt	Frozen vegetables	1993	6.2
Unilever NV	Netherlands, UK	Poland	SZPT Olmex - Slaskie Zakłady Przemysłu Tłuszczowego	Margarine	1992	25
Unilever NV	Netherlands, UK	Poland	Roma International (Wytownia Lodow)	Ice cream	1993	17.5
Unilever NV	Netherlands, UK	Czech Republic	Povitarske Tukove Zavody	Margarine	1992	7.5
Unilever NV	Netherlands, UK	Hungary	VMTV	Margarine	1992	0.8
Schoeller Lebensmittel GmbH	Germany	Czech Republic	Budatej	Milk processing	1991	58
Schoeller Lebensmittel GmbH	Germany	Hungary	Mizsa Rt	Ice cream	1992	36.4
Schoeller Lebensmittel GmbH	Germany	Poland	Namyslow Plant	Ice cream	1995	10
Heinz HJ Co	US	Czech Republic	PMV Zabreh	Baby foods and dairy products	1996	40
Heinz HJ Co (with Hillsdown)	US	Hungary	Kecskemeti Konzervgyar Rt	Ketchup production	1992	5.5
BSN-Danone	France	Poland	Wola	Dairy products	1991	5
Danisco Ingredients	Denmark	Czech Republic	Pektin Smirice	Producer of apple pectin and winager	1995	7.2
Kraft	Germany	Poland	Mazowsze	Cheese production	1993	2.9
Kraft Jacobs Suchard (Philip Morris)	Switzerland	Poland	Mleczarska 'Mazowsze'	Dairy products	1994	2.8
Kraft Jacobs Suchard (Philip Morris)	Switzerland	Hungary	Csemege		1992	24

Kraft Jacobs Suchard (Philip Morris)	Switzerland	Lithuania	Kraft Jacobs Suchard Lietuva	Food and kindred products	1993	15.9
Kraft Jacobs Suchard (Philip Morris)	Switzerland	Slovak Republic	Jacobs Suchard Figaro AS		1992	14.1
Kraft Jacobs Suchard (Philip Morris)	Switzerland	Hungary	Jacobs Suchard	Confectionery	1990	7.5
Kraft Jacobs Suchard (Philip Morris)	Switzerland	Poland	Olza SA	Chocolate production	1993	5
Kraft Jacobs Suchard (Philip Morris)	Switzerland	Romania	Poiana-Produse Zaharoase	Confectionery	1994	4.4
Nestle SA	Switzerland	Poland	Kalisz Food Concentrates Winiary	Sauces, mayonnaise, seasonings, desserts and baby foods	1995	75
Nestle SA	Switzerland	Poland	Goplana SA	Food	1993	42
Nestle SA	Switzerland	Hungary	Nestle Intercokolade (Nestle Hungaria Rt)	Food and kindred products	1991	35
Nestle SA	Switzerland	Poland	Kobylnica Plant	Baby food	1993	13.8
Nestle SA	Switzerland	Slovakia	Nestle Food	Soups and sauces	1993	6.9
BSN with Nestle SA	France	Czech Republic	Cokoladovny Praha a.s.	Biscuits	1992	70
Nestle SA with BSN	Switzerland	Czech Republic	Cokoladovny Praha a.s.	Biscuits	1992	70
Cadbury Schweppes Plc	UK	Poland	Cadbury Poland	Chocolate production	1995	50
Mars Inc.	US	Poland	Master Foods Polska Sp.	Sweet factory	1995	50
Kellogg	US	Latvia	Kellogg Latvija	Cornflakes production	1992	22
Nutricia	Netherlands	Poland	Okregowej Spoldzielni Mleczarskiej	Baby food	1995	5
Nutricia	Netherlands	Hungary	Hajdutej Tejipari	Baby food	1995	4.6

Source: S. Alessandrini (2000)

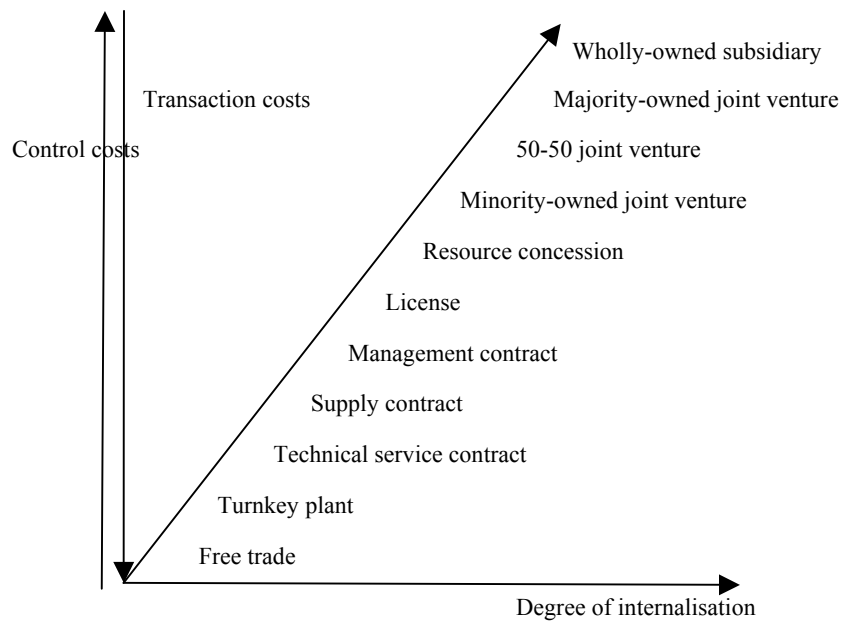
**Table 6**

**Parent Company Reasons for Investing in CEE**

Penetrate new markets	2,03
Broaden the market for our own products	1,25
Accumulate experience on Eastern markets	0,87
Establish a foothold there	0,78
Acquire a dominant position on new markets	0,52
Exploit cheap labour and technicians	0,35
Obtain immediate profits	0,22
Use local fiscal incentives	0,19
Import products manufactured locally	0,16
Exploit the incentives available in the countries of origin	0,09

Source: Genco P. et al (1993)

**Figure 10**



Source: J.L.Mucchielli, 'Les firmes multinationales: mutations et nouvelles perspectives, Paris', Economica, 1985, p. 209