ECONOMIC ANALYSIS OF FOREIGN MARKET ENTRY STRATEGIES IN THE US/EU AGRICULTURAL TRADE CONTEXT

by

CRISTINA LELIS LEAL CALEGARIO

(Under Direction the of Jack E. Houston)

ABSTRACT

Foreign direct investment has often been cost-effective in reaching foreign markets. Technical trade barriers imposed by the European Union (EU) restrict the exports of genetically modified organism (GMO) products, while production at home incurs, besides transport costs and tariffs, the costs of segregating products into GMO and GMO-free, labeling the products, and shipping them separately from conventionally produced crops. It may be economically advantageous for a firm to invest capital in overseas production rather than ship the product from a domestic source. Our approach integrates international business, management science, and industrial organization concepts to determine factors that influence a U.S. food processing firm's choice to enter into the EU and to examine the effect of mode of entry on the linkages between firms' strategic factors and performance.

The entry choice of each company into the EU market – acquisition or joint venture – uses longitudinal (panel) data, company observations measured at the same and at different years of entry. We applied Logistic regression and Generalized Estimating Equations to test 16 hypotheses with respect to mode of entry. The GEE model presented highly significant p-values than the Logistic model for the estimators and most all the coefficients were consistent with our theory. American agricultural and food business companies operating in EU choose their mode of entry based on host country factors. The firm-specific variables are also very influent in the model. The larger the size of the US food companies, the more likely that entry in EU countries will be through joint ventures. Firms engaged in the early or middle stages of making a processed food product show a trend towards joint venture, and those engaged in the later stages tend toward acquisition. Research and development-intensive firms seem trend towards joint venture. However advertising intensive firms prefer to enter through acquisition.

In the third model we show that the use of interaction terms in the regression model changed considerably the direction of interpretation of many firm-specific factors influencing performance.

INDEX WORDS: Acquisitions, Joint Ventures, Agricultural Food Companies, GMO, Technical Trade Barriers, Multinational Companies, Logistic Regression, Generalized Estimating Equations.

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To *God*, pela minha vida. To *Natalino, Nicole* and *Gabriel* pelo grande amor.

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CHAPTER 1

INTRODUCTION

US Exports of GMO Products

The United States (US) is among the world leaders in exports of agricultural and processed food products, and Europe is an important trading partner of the US. In 1997, 20% of US exports were directed to Europe, an amount of $11.3 billion. The European Union (EU) accounts for a major part of total US exports to Europe. In 1997, 77.9% of US exports to Europe went to the EU. Major US exports to the EU include soybeans, feed and fodder and tree nuts (USDA/FAS, 1998).

Technical barriers have been strongly affecting trade in agricultural and food products. Roberts and DeRemer (1997), in a survey about European regulations affecting US agricultural exports, found 57 questionable measures in Europe with an estimated annual trade impact on US agricultural and food exports of $899.55 million. Many of those barriers affect trade in animal products, with an impact of $477.3 million that accounts for 53% of estimated total trade impacts, and in exports of processed foods and grains, exceeding $100 million impact over all European barriers. In a recent study about technical trade barriers in US/Europe agricultural trade, Weyerbrock and Xia (2000) identified important issues affecting the European and US bilateral trade, including the genetically modified organisms (GMO) - a group of disputed regulations related to US GMO products, such as corn, soybeans, feed and food products made with them.

The EU initially rejected scientific evidence regarding the safety of GMOs. It banned, among others, imports from US of genetically modified corn. Moreover, it initially demanded

that other US genetically altered products imported to EU markets were labeled and shipped separately from conventionally produced crops. Labeling and additionally required health and environmental tests increase the cost of US exports (Weyerbrock and Xia, 2000). US soybeans exports to Europe dropped from $305 million in 1996 to $1 million in 1999. Corn exports fell from $2.6 billion to $1 billion (Source Code, 2001).

Weyerbrock and Xia (2000) concluded in their study that, in the future, technical barriers to US/Europe trade are likely to increase. The main factors, which will contribute to that increasingly, involve the increased demand for food and environmental safety. The richer a country, the higher the demand for food safety and product attributes. The EU and US are among the richest countries in the world. Eastern Europe and Russia are expected to grow rapidly in the future. Eastern European and Baltic countries have applied for EU membership, and then all the regulations will be applied for these countries, also. Industry observers in the US fear that Russia will model many of its new regulations on EU examples.

Appleyard and Field (2001) describe the technical trade barriers as non-tariff barriers and list them as one of the reasons for capital movements, that is, it can induce an inflow of foreign direct investment (FDI). They explain that if trade restrictions make it difficult for the foreign firm to sell in the host country market, then an alternative strategy for the firm is to "get behind the tariff wall" and produce within the host country itself. Information from Source Code (2001) tells that some companies that produce and use GMO products in their processing food products are doing just that. Although scientific research to date indicates no safety differences between GMO and non-GMO, some food companies have taken their decisions: Nestlé has stopped buying any grain from genetically altered seed for its European products. Companies like

McDonald's, Kellogg's, Kraft Foods and Quaker Oats sell gene-altered food in America, but not overseas (Source Code, 2001).

Empirical studies of FDI have become much discussed throughout the 20th century. FDI is usually discussed in the context of the multinational corporation (MNC) - how these firms enter foreign markets. Discussions have focused on the choice between exporting and FDI, and on the choice between greenfield ventures and acquisitions, in the internationalization of companies from the general industries. Some studies concentrate on parent-firm characteristics and others take into account the characteristics of the host country markets. But very few empirical studies specifically have focus on food industry companies which involves agribusiness firms. The existent works in agricultural and food products objectively describe FDI as a strategy to access foreign markets, but they do not focus on the economic analysis of the foreign market entry decisions.

Agribusiness firms have very specific features that make this distinction relevant. Besides that, the field of agriculture is experiencing a fast transformation in technology, information systems and demand for products that have caused a great many changes in the structure of the industry and consequently in conduct of the firms such as mergers and acquisitions (Legazkue, 1999).

In the context of an environment made up of biotechnological advancement, changing consumer demand, international trade conflicts and government regulations, this study will examine how agribusiness firms enter foreign markets. The idea is that the understanding of the economic impact of these factors can be used in the analysis of entry decisions in the foreign market to inform firms and governments about the alternative strategies of investment and implementation of regulatory policies, respectively.

The MNC is treated here as Caves (1996) defines, an enterprise that controls and manages production plants, located in at least two countries. Then, to better develop an economic analysis of this enterprise, a model will incorporate, in the context of the food industry, insights of diverse theories. Internalization theory, integrates the research literature of transaction cost and economic organizations, where entry involves two interdependent decisions - location and mode of control (Buckley and Casson, 1976). Concepts from other branches of economic analysis, such as industrial organization, consist of an analysis of the market structure and behavior of the firm (Knickerbocker, 1973; Tirole, 1988; Carlton and Perloff, 1999). International economics encompasses the locational forces approach and the movement of capital. And finally, other important theoretical concepts from strategic management explain how strategic behavior influences the competitive positioning of the firm (Kogut, 1989).

A broader framework for entry decisions supported by research findings in agricultural economics is necessary in order to provide new insights to agribusiness corporations. It will also provide information for policy makers in the home and host country to be able to set regulatory decisions in order to stimulate the continuing development.

Objectives

The primary interest of this study is to develop an economic analysis of the foreign market entry decisions examining how US agribusiness firms, which use GMO products in their processing of food products, enter the EU market. Specifically, the study objectives examine the determinants of the modes of entry into the foreign markets, encompassing the choice between acquisition and joint ventures and identifying the effects of the entry mode on the profitability of the firm.

General Background

The commercialization of transgenic crop varieties is expanding rapidly in the US. Many transgenic crops promise external environmental benefits as well as economic benefits to farmers. Nearly two-thirds of the products on American supermarket shelves contain genetically modified organisms (Source Code, 2001). The use of GMO for the food processing industry increased because these products are more cost-efficient substitutes than many of the present food and feed grains have been.

Although it is believed most US consumers generally accept foods with GMO, resistance is growing among some consumer segments both domestically and internationally. This is particularly evident in the EU, making the demand for foods produced from GMO grains uncertain (Lusk et al., 2001). Ethical, environmental, and food safety concerns have been raised.

Demand for information concerning consumer premiums for non-GMO foods is growing as the safety and nutritional characteristics of GMO foods are being debated with increased frequency. Consumers are increasingly considering information on how foods are produced in making their buying decisions. This leads producers, processors, and retailers to do the same. The US federal agencies that regulate food and agricultural products produced through the use of biotechnology face a dilemma in designing labeling on biotechnology products to inform consumers of the presence or not of GMO. Consumers are demanding, for example, labeling of products manufactured with GMO.

Genetically Modified Organisms

Genetically modified foods are produced with crops that have been supplemented with foreign genes, that is, genes from other species. Although every crop we eat has been “modified” from its original state over hundreds of years by farmers and scientists in search of desirable

traits and various degrees of plant and animal modification have occurred, new genetic engineering technologies are creating feed grains and oilseeds tolerant to pesticide, diseases, etc. These characteristics have increased crop yields and production flexibility and consequently have resulted in high levels of acceptance among agricultural producers. When introduced in 1996, GMO corn and soybean comprised less than 2% and 8%, respectively, of total planted crop acres, but these grew corresponding to 25% and 52% of planted acreage in 2000 (U.S. Department of Agriculture/National Agriculture Statistics Service).

Although altered seed already account for huge proportions of the US production, opposition to the use of GMO in agricultural commodities and food products are growing in the EU member states, such as Austria, France, Greece, Luxembourg, and the United Kingdom (UK). For example, in 1999, French activists and farmers protested a US fast food chain not only because it sells food products made with GMO, but also because it represents American's general acceptance of GMO foods (Lusk et al., 2001). European members had imposed either specific bans, or some form of moratorium, on the commercial use of GMO (Weyerbrock and Xia, 2000).

Companies from agrochemical field crops, that since 1994 have been characterized by structural changes, such as mergers, joint ventures or outright acquisition of other partners, have promised farmers that they will buy their gene-altered grains. Executives from Cargill Inc., Archer-Daniels-Midland, and Du Pont's Pioneer Hi-Bred International say it may be too late to abandon genetically modified crops, for that would entail creating a more costly and cumbersome system to separate the two kinds of commodities. Monsanto has been slammed by demonstrators for blatantly supporting genetically modified products. Showing signs of retreating from this opposition, part of its merger with Pharmacia & Upjohn, the company will

sell off almost 20 percent of its agricultural division. Similarly, Switzerland-based Novartis, a leader in bioengineered foods, has announced a merger with AstraZeneca. They will spin off the combined agricultural divisions, in part because of the consumer backlash against GMO and a resulting decline in stock prices (Source Code, 2001).

The five countries that regulate GMO – US, Canada, Mexico, Japan and the EU – have all considered the appropriate role of labels in signaling these new production methods to consumers. Each of the five countries currently regulates the introduction of GMO products, but only the EU requires labels that specify the presence of GMO. This potential "technical barrier to trade" poses challenges to producers, consumers and governments alike (Phillips and Isaac, 1998).

Under current Food and Drug Administration (FDA) policy, GMO are reviewed for food safety before they are marketed. Therefore, labeling is viewed as unnecessary, since approved GMO do not pose risks to human health. However, consumer advocates argue that consumers have the right to know if a food contains GMO, because they may wish to avoid GMO for ethical reasons or because they are concerned that regulatory review has not been sufficient to prevent negative health and environmental impacts (Consumer's Choice Council, 2000). If this kind of legislation that has been discussed recently by the US government is passed, then mandatory labeling for GMO content could impact all the industry under GMO production.

Phillips and Isaac (1998) examined the potential impact of both mandatory and voluntary labeling schemes on the research and commercialization of process-based GMO products. Their analysis concluded that mandatory labeling will impose excessive costs on the producers of GMO. In contrast, voluntary positive labeling of GMO-free products would limit the producer cost.

Trade Barriers

Despite the clear gains from free trade, the world is characterized by trade barriers that make prices in importing countries higher than world prices. These trade barriers increase the price of imported goods and therefore change relative prices in the economy. To Hillman (1978), typically, trade negotiations involve negotiations on tariff and non-tariff barriers with varying degrees of success. Tariffs are simply taxes on imports, while non-tariff barriers come in a multitude of different forms. Non-tariff barriers include production subsidies, licensing, strategic customs procedures, credit restrictions, packaging and labeling regulations and phytosanitary standards.

Reed (2001) explains that there are many reasons why a government might want to impose barriers on imports. In general, the government may want to redistribute welfare among the three major groups: producers, consumers, and the government. Some countries feel that certain products must be protected from international competition for national security reasons, and food is one of the products that are sometimes mentioned as important for national security. It is important that domestic producers should not be driven out of business by foreign competition. A similar argument for trade barriers is to protect newly established businesses during a critical phase in their development.

Recent studies of US FDI have confirmed a role for trade barriers in attracting FDI (Scarperlanda and Balough, 1983). Grubert and Mutti (1991), using a weighted average tariff in manufactures, found tariffs (and taxes) are important in determining the allocation of US FDI across countries. They found that tariffs encouraged local sales, but not sales to other countries through exports; in these cases, FDI aimed to serve the local market rather than exporting either

back to the home country or to a third market. In the presence of tariffs, it appears that FDI may substitute for exports. These results confirm that trade barriers may be one determinant of FDI.

Technical Barriers to Trade

Technical barriers in this study, following the suggested definition in Weyerbrock and Xia's study, refer to obstacles arising from both sanitary and phytosanitary (SPS) and technical regulations and measures. They are imposed on imports to make sure that international trade does not spread pests, diseases, and other problems to the importing country, and to ensure that imported products meet the same standards required of domestic products (Reed, 2001). To Weyerbrock and Xia (2000), although such regulations and measures are frequently motivated by domestic health and safety concerns, they may be used as non-transparent, difficult-to-challenge trade barriers.

As mentioned before, trade in agricultural and food products between US and EU has been strongly affected by technical barriers. International attempts to resolve differences in views on trading biotechnology and first-generation products such as GMO have focused on the World Trade Organization (WTO) and the Cartagena Protocol on Biosafety. The WTO is involved through the application of existing agreements on food and agricultural trade, and through the ongoing negotiations on the Agreement on Agriculture. The Cartagena Protocol on Biosafety, by some accounts, applies labeling requirements for trade in some GMO (Bredahl and Kalaitzandonakes, 2001).

If producers have to segregate their products, they need to be compensated by the market for the costs of segregation. Similarly, grain handlers incur additional costs if they have to segregate, test and certify crops from field to market. But the costs are much higher in processed food supply chains, since the complexity increases with the number of ingredients and their

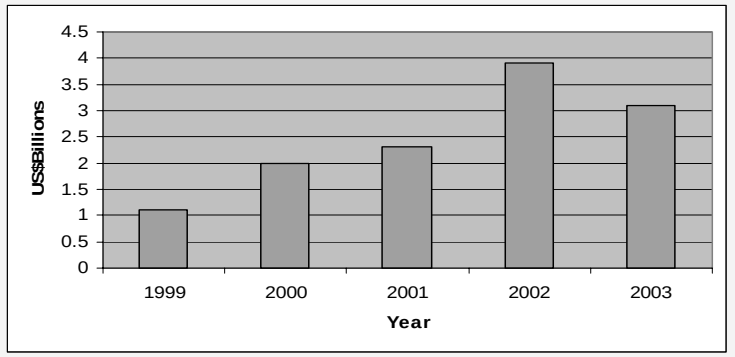
sources, as do other added costs. As a solution, Bredahl (2000), in his study for food processor response to consumer concerns for GMO, found that MNCs tended to produce in one European country and to distribute products to the other countries. Bredahl and Kalaitzandonakes (2001) found similar conclusions in their study about trade biotechnology. "Trade in the future generation of biotechnology will likely occur more in the form of investment flows and production for local markets than it will as trade in products. The market will be differentiated on the basis of consumer attributes that vary across nations or geographic areas". (Bredahl and Kalaitzandonakes, 2001, p.13).

Global Food Markets

The US food sector is blending more and more into the world food market. Overseas markets offer US food company's large opportunities for expanded sales (FoodReview, 1997). The food processing and beverage industry accounts for about one-sixth of the US manufacturing sector's activity, being the largest individual manufacturing sector of the economy (Weston and Chiu, 1996), but this sector has undergone significant reorganization as profits slide. Also, the food manufacturers continue to attempt to increase income and market share through consolidation, foreign growth, and new product development, and additionally the plants are growing more automated and integrated to realize economies of industrialization (ERS/USDA, 2002).

Recent data show that after a three-year growth spurt, US food manufacturers' foreign direct investment (FDI) fell more than 20 percent in 2003 to an estimated US$3.1 billion, according to preliminary estimates from March 2004 (Koudal and Weiner, 2004) (See Figure1.1). However, this slowdown in overseas food manufacturing investments has been anything but uniformly spread around the world. The number of cross-border mergers and

acquisitions (M&A) transactions slid from 7,894 in 2000 to 6,034 in 2001, 4,493 in 2002 and 4,200 in 2003. These figures, which represented a 7% drop from 2002, were the lowest since 1998 (UNCTAD, 2003 and 2004). Table 1.1 shows the cross-borders M&A with values of over $1billion in the period from 1987 to 2002, and Figure 1.2 shows the reduction in outward cross-border M&A activity in the Food and Kindred products industry (1999-2003), which declined from more than US$8 billion in 2001 to US$4.1 billion in 2002; recovering slightly to US$5.1 billion in 2003. Table 1 in the Appendix presents the M&A in the Food Industry by category in the period from 1997 to 2003, their major occurrence by category and their trend during the period.

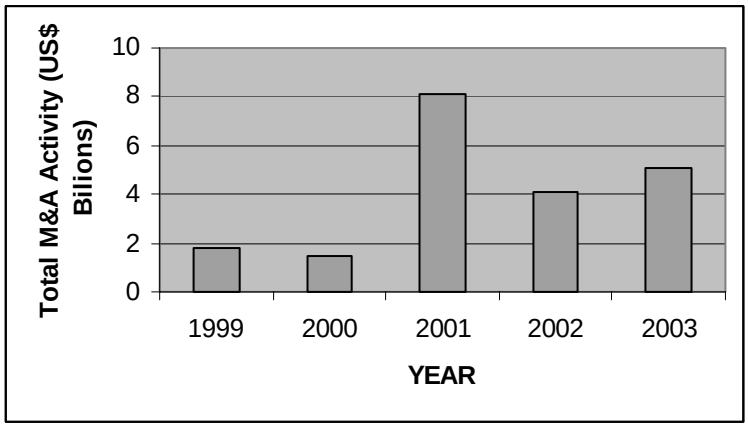


Source: Deloitte Research; US Department of Commerce, Bureau of Economic Analysis, International Investment Data, December 2003.

Figure 1.1: Global FDI trends of US Manufacturers in the Food Industry – 1999 to 2003

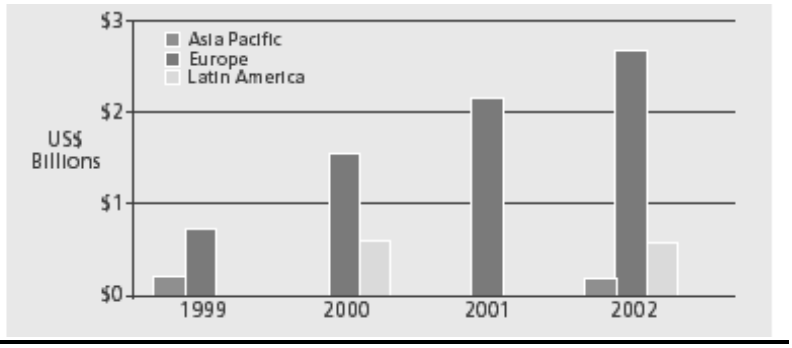
In fact, FDI is the major way large firms reach international markets. Sales from foreign affiliates of US food processing firms were four times larger than US export of processed foods in 1994 (Handy et al., 1996). Most US manufactures are putting their investment bets on the developed markets of Europe and are making only limited direct investments in emerging and low-cost markets of Asia Pacific, and Latin America (Koudal and Weiner, 2004) (Figure 1.3).

Actually, Europe continued to be the most popular location for new affiliates. This tendency suggests that access to markets continues to be a more significant factor in investment decision than access to low-cost labor.



Source: Deloitte Research; US Department of Commerce, Bureau of Economic Analysis, International Investment Data, December 2003.

Figure 1.2: Total Outward Cross-Border M&A Activity in the Food and Kindred Products Industry (1999-2003)



Source: Deloitte Research; US Department of Commerce, Bureau of Economic Analysis, International Investment Data, December 2003.

Figure 1.3 - US Manufacturing FDI in the Food and Kindred Products Industry – by Major Global Region

European countries accounted for 57% of total US affiliates' sales abroad. Within Europe, the United Kingdom is by far the largest recipient of US foreign direct investment, followed by The Netherlands, Germany and France.

In general, US multinational food processing firms do not establish affiliates abroad for the primary purpose of exporting products back to the US (With exceptions for US owned canned tuna operations abroad). In 1993, 78 percent of the sales from US affiliates abroad remained in the host country (local sales), while 22 percent was exported to other countries and only 2 percent of sales was exported to the United States. By comparison, other US (nonfood) manufacturing affiliates abroad exported an average of 14 percent of their total shipments back to the US (Handy et al., 1996).

Table 1.1: Cross-borders M&A with values of over $1billion, 1987-2002

Year	Number of Deals	Percentage of Total	Value (Billion dollars)	Percentage Of Total
1987	14	1.6	30.0	40.3
1988	22	1.5	49.6	42.9
1989	26	1.2	59.5	42.4
1990	33	1.3	60.9	40.4
1991	7	0.2	20.4	25.2
1992	10	0.4	21.3	26.8
1993	14	0.5	23.5	28.3
1994	24	0.7	50.9	40.1
1995	36	0.8	80.4	43.1
1996	43	0.9	94.0	41.4
1997	64	1.3	129.2	42.4
1998	86	1.5	329.7	62.0
1999	114	1.6	522.0	68.1
2000	175	2.2	866.2	75.7
2001	113	1.9	378.1	63.7
2002	81	1.8	213.9	58.1

Source: UNCTAD (2003), cross-border M&A database.

Moving to the global market provides firms with opportunities to reduce unit costs. Expanding production allows firms to spread their fixed costs for facilities and management over a larger volume. In the case of the food industry, there are some distinct aspects to be considered.

Food products are characterized by being relatively low value-added, but they may be differentiated through heavy advertising (Anastassopoulos, 2004). Because of the rapid rate of new product introductions, promotion and advertising are required to inform potential customers of their availability. As with other industries with high rates of product introduction, promotion and advertising expenditures are in the range of 25 to 35 percent of sales. The aim is to establish strong images. However many branded products give a firm a protected market position, this may not be sufficient to enable a firm to maintain a high rate of growth. Peltz (1995) comments that although Kellogg has had continued strong positions in a number of traditional cereal products, its market position in the ready-to-eat cereal segment of the food industry has eroded from 45 percent in the 1970s to 35 percent in 1995, while private labels have doubled their market share to 10 percent since 1988.

Anastassopoulos (2004) comments that the technological level in the food industry is relatively low compared to other sectors. However, food processing technology is improving, although it is taking the form of non-public goods as R&D spending is concentrated in few firms. To Legazkue (1999), biotechnology, computer and information technologies are the wheels that are driving agricultural and food processing forward. Stacking technologies in crop seeds, genetically modified organisms, nutraceuticals, precision farming, and so forth are clear examples of their technological change that agricultural business faced at the end of the century. However, greater environmental concerns and food safety are some of the main features characterizing this new technological era in the food industry (Legazkue, 1999).

Transaction costs and risks have been considered the main causes of the complexity involving the management of trade and FDI. Transaction costs are higher due the generally larger physical distance to the foreign market and the resulting greater transport, communication and/or negotiation efforts necessary for business success (Jaffee and Gordon, 1993: Fisher, 2004). Even when a company enters a foreign market and gets economically advantageous in overseas production rather than ship the product from the home country, there are cases where it will find transaction costs higher when trying to reach other neighbor countries. One case occurs when products made by foreign affiliates of US companies depend on products exported from the parent or other company from the home country. For example, American companies export syrups and malt for soft drink and beer that are manufactured abroad. Also, they often exports soybean oil and high-fructose corn syrup that are used as ingredients in processed foods like bread, bakery products, frozen dinners, and breakfast foods produced by Sara Lee, Kraft Foods, and Kellogg in other countries. Archer Daniels Midland, Ralston Purina, and Cargill often use agricultural products as ingredients in livestock feeds produced in their foreign plants (Bolling and Somwaru, 2001).

Another case where that transaction costs continue to have influence in the costs happens when US food companies, after making their entries in a specific country in the EU, try to reach neighbor countries by exporting their products. Findings from US food processing and agribusiness companies that operate in international markets indicate that, apart from general export management problems, the perishable nature of the food products adds to the complexity of completing international transactions successfully, since they present certain problems not associated with the majority of manufactured goods. Special handling, transportation, and storage are often required, at a substantially higher cost (Fisher, 2004).

Another distinct aspect of the food industry is related to the consumer's preferences and concerns. Besides the need to tailor products to local tastes and cultural differences, consumer concerns about food safety, the environment, and animal welfare issues affect demand in many developed countries. For example, to Bolling and Somwaru (2001), consumer demand for improved food quality has also led public and private sectors to develop and implement mandatory and voluntary quality control, management, and assurance schemes which are changing the way food products are produced, marketed and traded in Europe.

Organization of the Study

This study consists of five chapters. Chapter two presents a general background for GMOs, concepts, production and the recent issues involving the demand for safety food. It also presents a review of the principal problems in trade of these GMO products and characteristics of the global food industry. Following this discussion, a theoretical review of foreign market entry strategies is presented, encompassing the main theories, such as internalization theory and economics of industrial organization, international economics and international strategic management. The combination of these two perspectives provides a more comprehensive understanding of the economic analysis of market entry.

Chapter three develops the first model of this study, where we examine the determinant factors of the entry mode decision in a foreign market. A conceptual framework is presented and hypotheses are tested using the logistic regression approach. Discussion of the results and a brief conclusion are also presented.

Chapter four applies the Generalized Estimating Equations (GEE) to the conceptual framework developed in Chapter 3. Comparisons about the two methods of estimating the model, results and briefly conclusion are offered.

Chapter five develops a model to evaluate factors that, depending on the mode of entry, will affect post-entry performance of the agribusiness firms. Again, a theoretical framework with propositions and hypotheses are tested using a hierarchical linear regressions model as an attempt to evaluate factors related to cost-efficiency and the entry mode affecting the profitability of the firm. Following that, discussions of the results and brief conclusions are presented.

Chapter five concludes the study. It summarizes the main findings, provides implications for researchers, corporate managers and policy makers. Limitations and suggestions for further research are briefly explored.

CHAPTER 2

THEORETICAL APPROACHES IN THE LITERATURE

Foreign Market Entry Strategies

There is no well-developed theory of the determinants of the optimal modes of entry into the foreign markets and the entrant performance. There has been some convergence between the many branches of the economics of organizations, encompassing international economics and industrial organization and international business or global strategic management. To authors such as Dunning (1980) and Buckley and Casson (1998), linking all these theories together generates a high degree of complexity. Nevertheless, they attempt to do so.

In Caves' (1996) view, economic analysis has certainly not neglected the multinational corporation (MNC). In his work, he sought to integrate the economics of the organization theory with the findings about MNCs reported by each standard functional branch of economic analysis, by business administration, political science, and the like.

Dunning (1981) developed a framework which is referred to as "the eclectic theory of foreign direct investment". However, to sufficiently explain all MNC operations, that framework clearly lacks cases of vertical and diversified MNCs (Rugman, 1985; Teece, 1986).

In this study, there is no pretense of developing a complete analysis in the sense of covering all existent theories, because in fact we believe that constructs to explain the existence and prevalence of the MNC will vary from sector to sector, from country to country, and their own firm particularities. And in this way the theories will also vary according to each case.

Thus, our economic analysis of foreign market entry decisions will be basically addressed in extensions to four bodies of theory: internalization theory, economics of industrial

organization, international economics and international strategic management. These will be discussed individually, then conjointly in the frameworks developed for each model in the following chapters.

Internalization Theory

Internalization theory has an historical antecedent in Coase (1937) and an immediate continuity in the work of McManus (1972). Both emphasized the role of transaction costs in the development of foreign operations.

Transaction costs are zero in the case of perfect markets, where the single product firms compete. As firms become multi-activity and markets become imperfect, transaction costs assume greater significance. Essentially, "transaction costs comprise the costs of organization and the costs of strategy. As multiple tasks, such as coordination of the disposition of inputs, production and inventory control, inspection performance and product quality, and those related to logistics of the movement of people, assets and materials, marketing and final product, among others, become more important, so transaction, relative to production, costs will rise" (Dunning, 1993 p.78). The MNCs, then, arise as a response to market failures, as a way to increase allocative efficiency in the presence of high costs of coordinating economic activity between independent economic agents (Blomstrom, Kokko and Zejan, 2000).

The transaction cost of foreign direct investment (FDI) is also visualized as the cross-border expansion of firms. Two conditions must be met for this expansion to take place: (a) locating facilities abroad must be more efficient than exporting to foreign markets from a domestic location and (b) a firm must find it desirable to own the foreign facilities to organize its interdependence with foreigners through hierarchical rather than through market methods (Hennart, 1982; Hennart and Park, 1993).

Buckley and Casson (1976) were the first to give an explicit presentation of internalization theory. They envisaged the firm as an internalized bundle of resources, which can be allocated between product group, and between national markets. Their focus on market-based versus firm-based solutions highlighted the strategic significance of licensing in market entry, which involves two interdependent decisions: location and mode of control (Buckley and Casson, 1998).

Finally, internalization theory sees the MNC as the outcome of a process in which firms attempt to secure rents from their intangible assets in the presence of market imperfections. The emphasis is no longer, as in earlier theories, on the possession of firm-specific advantages leading to market imperfections. Rather, it is on the nature of markets, their weakness and limitations, and the organization of firms as a response to market imperfections (Blomstrom, Kokko and Zejan, 2000).

Economics of Industrial Organization

Economic analysis, in conjunction with other disciplines, especially organizational theory, has been offering several new insights into the determinants of foreign market entry strategies. Knickerbocker (1973) was one of the first studies of the relationship between entry behavior and market structure in the context of oligopolistic reaction. His study set up a crude game-theoretic structure for competitive entry into national markets (Buckley and Casson, 1998).

Hymer (1976) introduced FDI into the field of industrial organization. His point of departure was the observation that indigenous firms have advantages over foreign enterprises in the domestic market, because of their better knowledge of the local environment. In order to compete with local firms, foreign companies must therefore have some advantages that compensate for the disadvantage of operating in a foreign environment. Again, the theory of

perfect competition is not likely to apply in cases where FDI and MNCs are present (Blomstrom, Kokko and Zejan, 2000).

Caves (1971) distinguished between horizontal and vertical FDI and emphasized the importance of product differentiation in the first case. The ability to differentiate products, including advertising, and the concomitant skills developed to serve markets, are, in his view, the crucial monopolistic advantages behind horizontal FDI. Other advantages, such as technological expertise derived from investment in research and development (R&D), are expected to be strongly correlated with differentiation capabilities, since the bulk of these investments are directed to the development of new products and the improvement of existing ones. Thus, the product differentiation capabilities emphasized by Caves can be seen as both comprising technological intensity and advanced marketing (Blomstrom, Kokko and Zejan, 2000).

The importance of sunk costs in the shaping of market organization has long been investigated in industrial organization literature. Sutton (1991), Mercenier and Schmitt (1996) and others have demonstrated the existence of sunk costs, their various forms and suggest that the costless entry/exit assumption, though convenient, is an oversimplification of the models. Mercenier and Schmitt (1996) explain that the existence of sunk costs may also potentially affect the nature of the oligopolistic game once trade liberalization has been implemented.

International Economics

Foreign Direct Investment was traditionally a concern of international economics. Theoretical models for FDI and trade originated from the neoclassical Heckscher-Ohlin-Samuelson, and Mundel models (Kojima, 1975). These models examine free trade and the FDI process between two countries, assuming that they have unequal resources or factor endowments, the same production technology, face perfect competition on a free trade, and

produce identical or homogeneous products (Marchant et al., 1999). Then, in these traditional models, the FDI is treated as an international capital transfer between two countries.

A question that has arisen among international economists is whether trade and FDI are substitutes or complements. To Gopinath et al. (1999), this issue has been a concern for policy makers because of possible effects of outward FDI upon a country's balance of payments and employment of its work force.

Neoclassical theories concluded that as international factors become mobile, differences in countries' factor endowments become smaller and trade flows between countries decline. In this context, trade exports will eventually be displaced by FDI. Thus, exports and FDI are viewed as substitutes (Dunning and Rugman, 1985). On the other hand, researchers argue that MNC have become institutions that transfer intangible assets. As these intangible assets flow into another country, they attract movement factors of production, which increase trade flows (Hymer, 1976). And, as foreign markets expand through income growth, it is possible for both exports and foreign affiliate sales to grow together and thus benefit the home country (Lypsey and Weiss, 1984). Following this rationality, FDI and exports have a complementary relationship, where both increase.

More importantly for our study, within this discussion between substitutes and complementarity's, is why international economics helps to explain the existence and behavior of MNCs. Studies show that forces which restrict trade encourage foreign investment in those sectors where FDI is an option. For example, tariffs that have been largely used to protect a host market country from imports therefore encourage direct investment. The model of the behavior of a MNC in the face of tariffs was developed by Horst (1971), and many empirical studies confirm the influence of tariffs on MNCs' locational decisions. Caves (1996) discusses several of

the cases, confirming that firms that had established markets for their exports then found it more profitable to establish production facilities behind the tariff wall than to write off their investment in the local market or continue to serve it from lower-cost locations abroad.

Other empirical evidence regards the value-maximizing locational choices made by MNC. They take into account production and transportation costs, scale economies, and product differentiation, besides income growth per capita, good economic infrastructure, risk factors and political stability, among others (Dunning, 1981; Brainard, 1993; Root, 1998).

International Strategic Management

An alternative explanation for the MNC movement stems from theories on how strategic behavior influences the competitive positioning of the firm. International Strategic Management (ISM) research, a branch of Strategic Management, major research streams include environment, leadership and organization, strategy and performance, saw rapid growth through the 1980s (Ricks et al., 1990) and the 1990s (Werner, 2002).

A study developed by Lu (2003) identifies the main areas in which ISM has contributed. Her findings show that the literature deals with MNCs and the problems encountered by them in exporting or importing; The role of the MNC; The relationship between MNC and domestic corporations and also other topics, such as international financing management, international marketing management and so on.

This theory has been important in an identification of the motives to cooperate and the selection of partners (Vernon (1983). This perspective implies that the selection of partners, for example, is made in the context of competitive positioning vis-à-vis other rivals or consumers (Kogut, 1989). It is argued that the inherent tension between cooperation and competition in joint ventures is structurally similar to a prisoners' dilemma, and then, drawing from the game theory

literature, explores how to solve this cooperative dilemma and improve partner cooperation (Zeng, 2003).

Rumelt, Schendel, and Teece (1994) identified, among others, one fundamental question, in Strategic management related to firms, "What determines the scope of the firm", which has motivated many researches in the area. For Wang (2003), three streams of literature have been motivated from ISM. First, conclusions reached by different studies may be influenced by their sample period, and the question seems to be: "What determines the scope of the firm over time?" A second stream is the recent work on emerging economies that shows performance benefits associated with conglomeration. The third stream focuses on how institutional transitions affect strategic choices.

Typologies of international strategy have received a great deal of attention in the international management literature (Harzing, 2000). The studies distinguish two different types of international strategies: global and multi-domestic. Global strategies, which are the interest here, are characterized by a high level of globalization of competition with national product markets being interconnected and a focus on capturing economies of scope and scale. The dominant strategic requirement is efficiency, and as a result, these companies integrate and rationalize their production to produce standardized products in a very cost-efficient manner (Harzing, 2002).

Modes of entry in a foreign market

Dunning (1981), Root (1998) and Morsink (1998) and others classify the modes of internalization from the simple utilization of spot markets to the extensive governance of wholly owned subsidiaries. These are (1) international trade, (2) non-equity agreement and (3) foreign direct investment as shown in the Figure 1.1.

(1) In the international trade mode, the company can export its output, which was manufactured in the home market, to trading companies (wholesale and retail trade) or final consumers in a foreign market. The company can also import its inputs from this foreign market.

Exporting usually appears to the processing firm as the best entry mode to go international for the first time. A firm can start exporting with no incremental investment in fixed capital and incur relatively low startup costs, few risks, and profits on current sales by using *indirect* channels. Furthermore, the firm can gradually increase its export effort by building on prior success in foreign markets: adding products to the export line, entering new target markets, and shifting to *direct* exporting. Thus, exporting can become an international learning experience, a development process that takes the firm toward more and more international sophistication and commitment (Root, 1998).

(2) A non-equity agreement or a contractual entry mode is a long-term, non-equity association between an international company and a host company that involves the transfer of technology or human skills from the former to the latter. The most commonly known types are *licensing* and *franchising,* in which a company sells technical and/or managerial knowledge about particular economic activities to foreign firms. Other contractual entry modes, according Root (1998), are technical agreements, service contracts, management contracts, construction/turnkey contracts, contract manufacture, co-production agreements, and other.[1]

[1] See Root (1998, p. 112) for descriptions about other contractual entry modes.

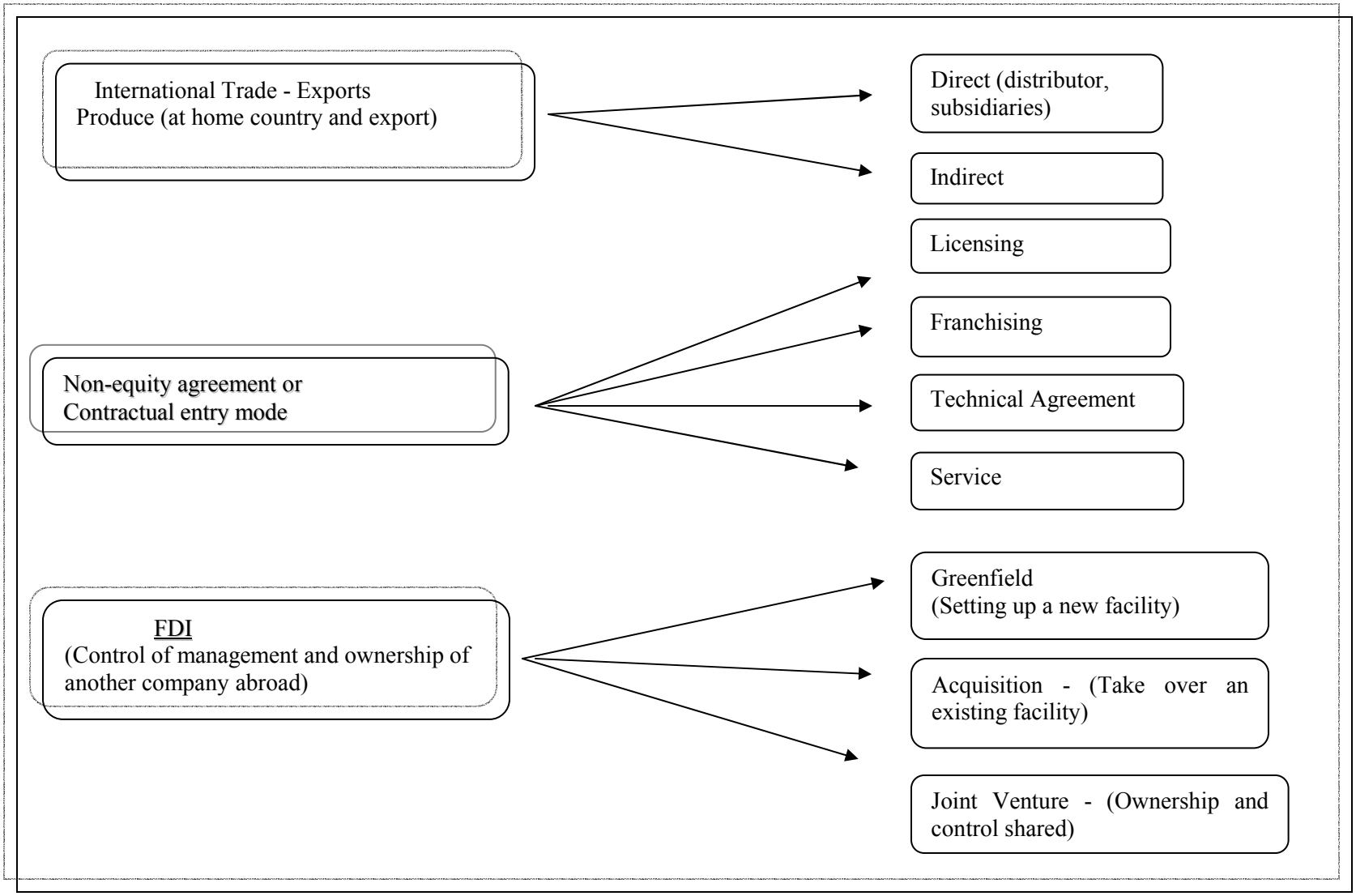


Figure 2.1 – Modes of Entry in a Foreign Market (Adapted from Root, 1998)

International licensing includes a variety of contractual arrangements whereby domestic companies (licensors) make available their intangible assets (patents, trade secrets, know-how, trademarks, and company name) to foreign companies (licensees) in return for royalties and/or other forms of payment. Licensing has the greatest advantage when exports are no longer possible to a target market at the sudden imposition of tariffs or quotas or when exports are no longer profitable under the appearance of more intense competition. Thus, instead of transferring a physical product, the manufacturer transfers intangible assets and services that are not subject to import restrictions (Morsink, 1998).

International franchising is a form of licensing in which a company (franchisor) licenses a business system as well as other property rights to an independent company or person (franchisee). The franchisee does business under the franchisor's trade name and follows the policies and procedures laid down by the franchisor. In return, the franchisor receives fees, running royalties, and other compensation from the franchisee (Morsink, 1998)

The basic difference between licensing and franchising is that in this second contract, the service element is particularly prominent. Because it includes the technical service, as in licensing, franchising ensures the proper use of the assets through general management and marketing assistance as well (Morsink, 1998; Root, 1998).

(3) Foreign direct investment is generally appraised as a far-reaching mode of internationalization. In essence, it is similar to the non-equity agreement mode (Morsink, 1998). The main distinctive feature of foreign direct investment is control of the management and ownership of another enterprise abroad. The subsidiaries (as these firms are called) may range all the way from simple assembly plants that depend entirely on imports of intermediate products from the parent company to plants that undertake the full manufacture of a product. A company

can choose to create a local production facility by setting up a new facility (*greenfield investment*), it can take over an existing facility (*acquisition investment*) or form a *joint venture,* with ownership and control shared with one other company or more (Root, 1998).

Entry by starting a new business unit, a greenfield investment, according to Root (1998), allows a company, among many other advantages, to transfer managerial, technical, marketing, financial, and other skills (its knowledge assets) to a target country in the form of an enterprise under its own control. Investment entry enables that company to exploit more fully its competitive advantages in the target market. It may lower the costs of supplying a foreign target market because of savings in transportation and customs duties and/or lower manufacturing costs resulting from less expensive local inputs of labor, raw materials, energy, and so on. Local production may also increase the availability of supply, if quotas limit imports or if a company's supply of export products is constrained by plant capacity in the home country. It may also enable a manufacturer to obtain a higher or more uniform quality of supply and create marketing advantages, since it provides far more opportunity than domestic production to adapt a manufacture's product to local preferences and purchasing power.

Compared to other modes, greenfield investment entry requires substantially more capital, management, and other company resources. It includes high startup costs, long payback periods, and the difficulty of disinvestment in the case of failure or a change in strategy (Root, 1998).

To start a subsidiary by acquisition, the prospective parent goes into the market for corporate control and acquires equity shares in a going business. According to Caves (1996), it must compete with current equity shareholders (persons and institutions) in general, and their rivalry forces the buyer to pay a price that would let a non-controlling investor earn only a

normal or competitive rate of return on the acquired business. The parent company might expect positive payoffs, of course, if running the acquired business increases rents to its proprietary assets, or if the buyer company enjoys a lower cost of capital.

Entry by acquisition is less risky than greenfield. The going business is a working coalition. From the viewpoint of the foreign MNC, it possesses an operating local management familiar with the national market environment. The MNC that buys the local firm also buys access to a stock of valuable information. These factors reduce the uncertainty about the new subsidiary's subsequent cash flows. Therefore, in general, to choose acquisition rather a greenfield is to choose a lower but less uncertain expected rate of return (Caves, 1996).

However, some concerns exist if acquisition is used as an entry mode. If the acquired company has a product line that is not similar to, or compatible with, the investor's, it will fail to provide a vehicle for a transfer of the investor's knowledge and skills needed to exploit the target market. Indeed, a new problem is created: managing at a distance a foreign company whose product line and market are strange to the investor. Difficulties also can exist in locating and evaluating acquisition candidates, and when they find a possible candidate, this will require substantial new investment to bring them up to standard (Caves, 1996).

Joint ventures entry takes place when an international company shares in the ownership of a local company in a target country. Most commonly, a foreign company agrees to share capital and other resources with a single local company. Depending on the equity share of the international company, joint ventures may be classified as majority, minority, or 50-50 ventures (Buckley and Casson, 1976).

Among the many benefits to a the foreign partner, are the contributions from the local partner in terms of local capital (which reduces both the investment and the risk exposure of the

foreign partner), knowledge of the host country environment and business practices, personal contacts with local suppliers, customers, banks, and government officials, management, production, and marketing skills, local prestige and other resources. The local partner's contributions, when combined with the foreign partner's (especially technology and related skills), can sometimes exploit a target market more effectively than a greenfield or an acquisition investment (Root, 1998).

However, problems also can limit joint ventures. To Caves (1996), while a rental or purchase contract simply transfers control of an asset, a joint venture links the partners through an incomplete contractual relation in which their shared equity commits them to negotiating how to handle whatever disturbances or opportunities subsequently arise. This incompleteness implies high ongoing cost of haggling and monitoring. Root (1998) comments that the frequent problem areas of joint ventures include profit reporting, dividend policy, capital expansion, the pricing of inputs sourced from both parent, and executive compensation.

Many factors influence the choice of the entry mode in the foreign country[*]. Root (1998) describes these factors as internal and external factors, as in the following.

Internal factors are related to product (degree of differentiation, necessity of pre-and post-purchase services, technology intensity and adaptation to the new market) and resource/commitment factors (how limited is the company in terms of resources and commitment). *External factors* involve (1) market, (2) production, and (3) the environment in both the foreign and the home countries. Market factors are related to the size, the infrastructure, and the competitive structure of the market foreign country. Production factors refer to the quality, quantity, and cost of raw materials, labor, energy, etc. and the cost of the economic

[*] See Root (1998, p. 8) and Morsink (1998, p.13) for further information on factors that influence the choice of the entry mode.

infrastructure (transportation, communications, port facilities, etc.). Environmental factors are related to the political, economic, and socio-cultural character of the foreign country (Root, 1998).

Perhaps this last external factor, environmental, can be one of the most important factors to influence the choice of the entry mode. Government policies and regulations can restrict trade with high tariffs, quotas and, as seen above, technical barriers. They can also make restrictions on acquisitions, since this mode does not make much economic contribution and certainly not enough to offset the undesirable displacement of local ownership with foreign ownership. Local governments, then, may be more favorable to greenfield investment that possibly will contribute with new technology, employment, and other economic development attributes (Morsink, 1998).

The features of the economy, such as if the economy is market-driven or centrally planned, the size in terms of gross national product, and external economics relations, such as the balance of payments and exchange rate behavior have also a fundamental influence in the choice of the mode. Finally, the socio-cultural factors, where cultural distance, such as values, language, social structure, if great, usually makes the cost of information acquisition high (Morsink, 1998).

Most of these factors, according to Morsink (1998), involve considerations and evaluations of potential market revenue and future production and transaction costs; namely, non-recoverable set-up cost, recurrent fixed cost and recurrent variable cost as determinant of the internationalization mode. Also, considerations on how to cope with risk and uncertainty must be considered. For example, if high political risks in a foreign country are perceived, such as general political instability or the threat of expropriation, they favor entry modes that limit the commitment of company resources. Conversely, low political risks encourage equity investment in that country (Root, 1998).

CHAPTER 3

DETERMINANT FACTORS OF THE ENTRY MODE

Introduction

In this chapter, the conceptual framework used to make an analysis of the determinant factors of the entry mode is proposed. This framework builds on perspectives of the four bodies of theories discussed earlier to develop theoretical hypotheses, specifically for food industry multinational companies.

The expansion of the firms beyond the domestic market allows them to pursue growth opportunities unavailable in the domestic market, to spread risk through geographic diversification, and to exploit brand and technology-related intangible assets. A foreign subsidiary enables the parent firm to capitalize on intangible investments, because it allows for greater control over the quality, distribution, and presentation of the product in the foreign market (ERS, 2000).

The findings in the literature on MNC's determinants of the entry mode come from a broad spectrum of fields, such as international business, management science, international economics and industrial organization. Those findings suggest a series of factors and accompanying hypotheses about the circumstances in which the foreign firm is more likely to choose a particular entry mode.

The approach proposed in this study will integrate several strands of those theories to determine the factors that influence food processing firms' choices with respect to entering the EU. FDI has often been a cost-effective way to reach foreign markets. For some food products, such as GMO products, it is economically advantageous for a firm to invest capital in overseas

production rather than ship the product from a domestic source (Bolling and Somwaru, 2001). Technical trade barriers imposed by the EU restrict imports of GMO products. Production at home incurs, besides transport cost and tariffs, cost of segregating products into GMO and GMO-free, labeling the products, and shipping them separately from conventionally produced crops (Weyerbrock and Xia, 2000). Thus, it is assumed that US firms facing export restrictions on GMO products will decide instead of producing at home and exporting or making other kinds of contracts, to establish their production in the EU market.

Therefore, this study will focus explicitly on the choices faced by a firm, which has decided to enter a market via FDI, as between acquisitions and joint ventures. As explained above, other alternatives, such as exporting, licensing and franchising, will not be considered, since the technical trade barriers imposed by EU restrict the exports of GMO products. Regarding greenfield, it will not be investigated, since data *a priori* (Food Review, 1996; ERS/USDA, 2002) indicate that most foreign direct investment occurs by acquisition of or merger with existing companies rather than by construction of a new facilities.

A Conceptual Framework to Determine the Mode of Entry

It is posited that MNCs' choices are influenced by two types of factors: host country-specific factors and firm-related variables (Contractor and Kundu, 1998) divided into firm-specific variables related to resource factors and firm-specific variables related to financial and performance factors (Chatterjee, 1990) (Figure 3.1).

Host country-specific factors

Few empirical studies have incorporated host country market characteristics in the analysis of entry mode. Teece (1982) was one of the few studies to introduce variables from the host country's policy into his model of the determinants of the firm's organizational choice. To

him, the firm's choice will depend on country factors, such as attitudes towards foreign ownership in the host country.

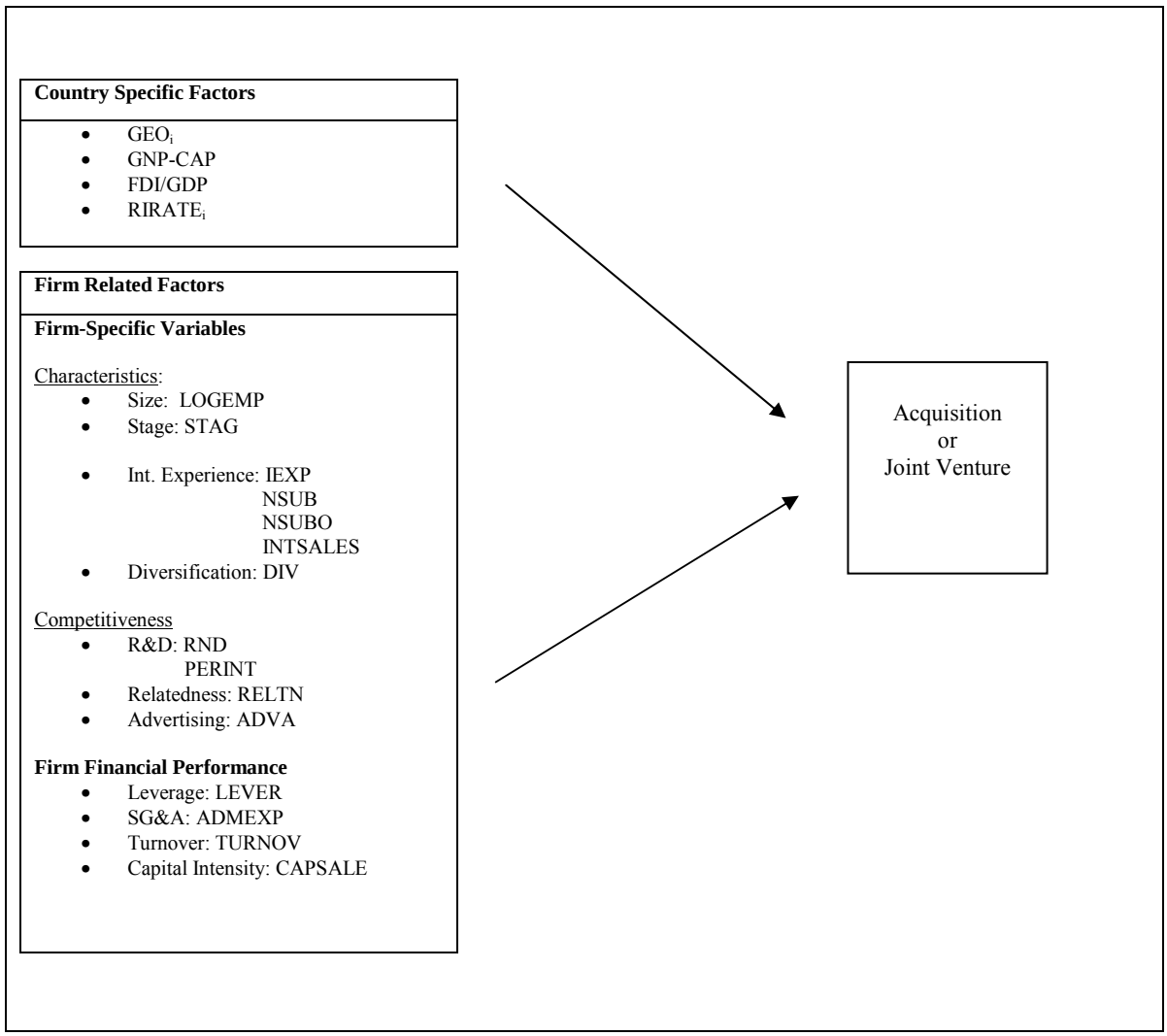


Figure 3.1: Determinants of the Mode of Entry into a Foreign Country

Dunning (1980) also emphasized the value of country-specific factors in his theory of the MNCs. He explains that locational advantages are those associated with the availability of inputs for all firms established in a certain country. They comprise natural resources, location, cultural

and political environment, factor prices and transports costs, but also government policies such as trade barriers (quotas, tariffs) and local content requirements.

In our model, variables such as geographic scope (GEO), level of development (host country's GNP per capita, GNP-CAP), FDI to GDP ratio (FDI/GDP), and interest rate (RIRATE) from the host country are analyzed.

Geographic Scope – GEO

Geographic scope is an external factor that influences the choice of the entry mode in the foreign country. As described before, an external factor involves market, production and environmental factors. Because the host countries in this study together form an economic block, the EU, most of those characteristics are similar and they will be treated as unique property of each country.

When a firm goes to a specific foreign country for the first time, it faces a high level of uncertainty about the norms, culture and business practice and/or about the different demand and consumer preferences and/or also about the political or economic environment. Kogut and Singh (1988) add the role of the cultural characteristics from host countries to their model analyzing the entry into US market. They found that cultural distance from the US weakly deters greenfield investment but significantly promotes joint ventures. Relative to a study of Japanese entries into the US, he found that cultural aversion to uncertainty significantly deters greenfield investment entries.

Then, following McNaughton (2001), geographic scope is a variable which includes sources of behavioral uncertainty, such as cultural distance from the foreign country, and sources of demand uncertainty, such as political risk. McNaughton (2001) found in the analysis of US software firms, in their relationships with European firms, that the likelihood of acquisition is

decreased if the European partner is located outside of the UK, since it is the country with the least American cultural distance. But he found that the likelihood of a joint venture is increased. He explains that the more uncertain the environment, the more appropriate a structured mechanism, usually a joint venture, that provides high access to information and some ownership control. Acquisition, in this case, is cautioned, primarily because of the financial risk, and difficult incorporating local knowledge (Contractor and Kundu, 1998).

Comparing greenfield, acquisition and joint venture, some authors relate that starting a new business by greenfield might also be more risky than acquisition, because once a firm buys a local firm, it avoids the cost of adaptation to a new place and reduces the uncertainties about the investment (Caves, 1996; Buckley and Casson, 1998). However, there is very little empirical research comparing acquisition and joint venture.

Although the EU is an area characterized by a high development status under an internal integration process, consumption differences exist among countries and regions in Europe, originating some demand uncertainties. Gracia and Albisu (2001) present some quantitative comparisons and qualitative explanations about the food consumption in the different countries of the EU. To them, biotechnology has been an important issue for European consumers. Once they knew about products derived from GMOs, the first reaction was to be against them. But food control has not been effectively undertaken in many European countries and the perception is quite different among countries; the northern countries are not prone to food certifications, contrary what generally happens in the south. However Joly and Lemarie (1998), in a study about industry consolidation and public attitudes towards plant biotechnology in Europe, present contextual factors to explain why France and the UK, despite a traditionally positive attitude towards GMOs, are now the first countries to argue for a partial moratorium. The position of the

UK towards biotechnology in fact varies from one study to another. However, because there is no study relative to these opposite arguments, it may be worthwhile to assume that UK is the country with the best acceptance of American companies.

Geographic Scope (GEO) in this model will be associated to the variables location and cultural distance to show how uncertainty of demand may influence the mode of entry choice. It is proposed that known firms that process foods with GMO in the US, which will invest in the EU, will take the form of joint ventures in countries other than the UK and the form of acquisition if located in the UK.

Then, the first hypothesis follows:

> *Hypothesis 1*: *The likelihood that an American food processing company will enter into the EU market through joint venture investment mode will be positively associated with investments made in a host country other than the UK.*

Level of development - (GNP-CAP)

Two opposite hypotheses about the entry mode have been associated with the level of development of a country. To Zejan (1989), the more developed a country (referring to a high income nation), the more likely is the incidence of acquisition in the business. Analyzing the Swedish MNCs' expansion, he found that the higher the level of development measured by the GNPCAP, the easier it is to find firms that fit the acquisition requirements such as technological or managerial attributes. To Cohen and Levinthal (1990), cited by Contractor and Kundu (1998), the opposite tends to occur. Higher income nations will be associated with joint ventures for some reasons: First, the lower absorptive capacity of franchisees in lesser-developed nations, and consequently, higher cost of adaptation and knowledge transfer which acquisition requires; and

thirdly, in high profit potential areas, returns on equity investments far outstrip royalties; Last, although the per capita food consumption, in quantity terms, has not changed much in the EU, European consumers buy more added-value product, such as convenience and processed food (Gracia and Albisu, 2001). Then, the income level might capture the extent to which host country firms can bring a joint venture certain intangible assets of their own. If that is the case, we expect the probability for joint venture agreements to increase with the level of income in the host country.

Analyzing the influence of the host country's level of development on the MNCs entry decision, Zejan (1990) included GNPCAP – the host country's GNP per capita as a measure of income level in the analysis of Swedish MNCs' expansion. He found that the higher the level of development measured by the GNPCAP, the easier it is to find firms that fit the acquisition requirements, such as technological or managerial attributes, of a MNC.

Contractor and Kundu (1998), to analyze organizational forms in the international hotel sector, included variables such as level of economic development (GDPCAP), cultural distance (CUL), and foreign business investment penetration in the local economy (FDITOGDP). The results for this last variable were not significant, but for the first variable, GDPCAP, their hypotheses are confirmed; that is, equity-based modes are preferred in "low risk" and "low per capita income" nations, ceteris paribus. This result supports the findings of Kim and Hwang (1992), who indicated that in conditions of "demand uncertainty," equity ownership tends to be low. Then,

> *Hypothesis 2*: *The likelihood that an American food processing company will enter into the EU market through acquisition mode will be positively*

associated with a higher level of economic development (GDP-CAP) in the host country.

FDI to GDP ratio - (FDI/GDP)

FDI inflows to OECD countries have shown continuing rapid growth since 1999, particularly in Japan, Sweden and Germany. In the EU, the UK, Germany, France and Sweden were the most important host countries in the same period for inward for mergers and acquisitions (M&A). The increase in greenfield investment was significant in this year, but it was far exceeded by the growth in M&A. (OECD 2000).

EU countries differ substantially in their FDI activity. The UK exhibits a different pattern of FDI compared with other EU countries. To Ietto-Gillies, Meschi and Simonetti (2000), there are various reasons for this. The UK is more heavily involved in FDI in general and has a long history of such involvement. It also has a tradition of more liberal attitudes towards FDI. This means that UK has provided a welcoming and strategic location for those MNCs from the US and Japan that wish to avoid the EU trade barriers in reaching European markets. The same authors, using an intensive index of M&As, calculated the number of bids and targets from country *i* in the rest of the word to compare the share of EU bids and targets in the total international bids and targets of the country *i*. The results for targets indicate that the UK has progressively become the favorite target of global (rather than regional) FDI in the form of M&As, because of the ease of acquiring UK companies and the high level of deregulation of the British economy. From the bidder's point of view, a foothold in the UK provides an easy entry into the EU markets and production locations.

Dunning and McQueen (1981) proposed that in countries whose economies are more open to international investment and trade, or in nations characterized by a higher penetration of FDI, the firm will choose higher control and equity-based modes such as greenfield.

A study from the World Bank (2002) examined the link between the two components of FDI flows – greenfield and mergers and acquisitions (M&A) and their respective relationship with aggregate investment and growth. They found that in the industrial countries, higher M&A leads to more greenfield investment and vice-versa. So, it can be expected that EU countries which exhibit higher FDI will increase acquisition investment, since it means higher control. Then, the hypothesis can be expressed:

> *Hypothesis 3*: *The likelihood that an American food processing company will enter in EU market through acquisition mode will be positively associated with a host country's higher ratio of FDI/GDP*.

Real Interest Rate – RIRATE

Real interest rate (RIRATE), a macroeconomic variable based on the host country was used in an investigation of the determinants of the structure of the European banking industry by Cerasi, Chizzolini and Ivaldi (1998). A proxy for the cost of investing in fixed capital, the average cost of a new subsidiary was posited to increase if the opportunity cost of investing in fixed capital increases. A rise in the interest rate increases the convenience for acquisition. Although the results showed that the interest rate variable did not have a direct effect on the banking structure, they captured the significant effect of trends on competition in each European country. The same variable was also used by for Gopinath, Pick and Vasavada (1999) to identify the relationship between exports from a home country and production in a host country through FDI. It represents the opportunity cost for US producers investing abroad.

Following Cerasi, Chizzolini and Ivaldi (1998), RIRATE, in this model, is a proxy for the cost of investing in fixed capital. A rise in the interest rate increases the convenience for low equity. Then, it can be stated:

> *Hypothesis 4*: *The likelihood that an American food processing company will enter into the EU market through Joint Venture mode will be positively associated with a higher in the RIRATE in the host country.*

Firm-related factors

Some key factors related to firms have been traditionally utilized for explaining the firm's entry mode choice in foreign markets. They originated basically from the internalization theory which in this model incorporates transaction cost issues. Hennart and Park (1993) pointed out that transaction cost theory, which explains why firms invest in foreign countries, can be extended to show how the type of advantages exploited by the investor affects the mode of entry. Therefore, firms resort to governance structure, which reduces risks and the hassle cost of going abroad.

Firm-related factors have been divided in this model into two groups: The Firm-Specific Factors and the Financial Firm Variables.

Firm-Specific Variables

The literature used to explain this first group of variables has no single term. The ownership advantages, so-called by Dunning (1981), of firm-specific variables (term utilized in this model in the sense that the firm has control over them), embrace patents, expertise, labor skills and other forms of superior production technology, control over markets and trade monopolies, scale advantages, managerial capabilities and so on. Caves (1996) calls them proprietary assets that might represent knowledge about how to produce a cheaper or better

product at given input prices, or how to produce a given product at a lower cost than competing firms. The proprietary asset might take the form of a specific property – a registered trademark or brand – or it might rest in marketing and selling skills shared among the firm's employees. An other term that has largely been used in the literature to explain those variables is intangible assets. Chatterjee (1990) explains that physical and tangible resources include plants, equipment, land, and distribution channels. Knowledge-based, intangible resources include marketing and innovation skill and management know-how. To better understand how those factors may determine the mode of entry chosen by an entrant company, we separated them into two sets: characteristics and competitiveness of the firm.

Characteristics of the Firm

Parent companies' characteristics, such as size, stage, international experience and diversification, are viewed in this study as an entrant ability to pursue growth opportunities in a foreign market by locating production and/or distribution plants abroad through foreign direct investment. Such characteristics will define the firm competitiveness in reach and gain advantages in a new market.

Size

Small-sized firms, when deciding to go abroad, are particularly exposed to the risks inherent in FDI. For this reason, they would orient their internalization strategies towards joint ventures and alliances, in order to minimize risks (Kogut and Singh, 1988b; Larimo, 1994).

Nevertheless, Mutinelli and Piscitello (1998) mention the Williamson (1985) approach, which argues that large, widely diversified and internationalized firms, being very complex organizations, suffer from substantial costs due to inefficiencies of bureaucracy. Very large, diversified firms also have very powerful stimuli to enter into foreign market through joint

ventures. In their study they found that the availability of a great variety of specialized, non-reproducible, assets which are complementary to the ones possessed by other firms, the bureaucratic inefficiencies, and the ability to deter opportunism credibly explain the inclination of large firms to joint ventures and agreements. Therefore, large firm size in this study will be a determinant for a company to select joint venture as a mode of entry.

Hypothesis 5: *The likelihood that an American food processing company will enter the EU market through joint venture mode will be positively associated with its size.*

Stage of the firm

Food companies are generally divided between those engaged in the early or middle stages of making a processed food product and those in the later stages. Companies involved in the early to middle stages are also known as agribusiness companies (Industry Surveys, 2000).

Some agribusiness companies - Archer Daniels Midland Co., Corn Products International Inc., and Cargill Inc., for example - engage in such activities as growing, harvesting, milling, and/or processing raw agricultural commodities. They process and merchandise raw grains, such as corn, wheat, and soybeans, into end products that include oil, syrups, starches, and meal used in the food and feed industries, as well as corn sweeteners used in soft drinks. These end products generally aren't sold to consumers, but rather to late-stage processors and food packagers, which use these ingredients in making finished consumer products (Industry Surveys, 2000).

Other agribusiness-meat packers IBP Inc. and ConAgra, for example - slaughter livestock and chickens for others to process further. Dairy processors, such as Dean Foods Co., process raw milk into milk and related products, such as cheese and butter (Industry Surveys, 2000).

Companies engaged in the late stages of producing consumer food products are generally referred to as food manufacture's or food packagers. These companies, which include Kellogg Co., H.J. Heinz Co, Nabisco and others, sell their finished goods to food retailers, which in turn sell the products to consumers (Industry Surveys, 2000).

The rational involving those stages is that, depending upon the stage at which the firm is classified, it is likely to choose one mode over another. Firms involving in natural-resource extraction activities will probably reflect in a disposition toward joint ventures (Caves, 1998). Therefore,

> *Hypothesis 6*: *The likelihood that an American food processing company will enter the EU market through joint venture mode will be positively associated with it being in early or middle stages.*

International Experience

There is a consensus that firms, when deciding to internationalize, initially take non-equity positions, such as exporting or licensing, and later increase their equity investment levels. The reason behind that is that starting a new business unit in the foreign market might be more risky if the foreign firm is not familiar with the host market environment (Caves, 1996; Mutinelli and Piscitello, 1998).

Also, there is agreement that firms with greater experience or with numerous operations in the host country prefer subsequent entry in the form of acquisition. It is argued that firms with greater foreign experience have a pattern or routine of the process of expanding abroad through acquisition. As a result, these firms will often capture greater benefits from acquiring operations, compared with firms without such a presence (Caves and Mehra, 1986; Shaver, 1998).

Contractor and Kundu (1998) used two variables to test the influence of the international experience on choice mode: the number of years since the firm set up its first foreign operation and the number of properties outside the home nation of the firm, divided by the global total. Both variables yielded strong support for the hypotheses, that equity-based modes will be preferred by companies with considerable experience and existing geographic reach.

Similar results were found by Mutinelli and Piscitello (1998). The firm's experience in managing foreign operations due to previous FDI positively influenced the propensity to wholly own the foreign subsidiary.

However, Hennart and Park (1993), Kogut and Singht (1988) and Zejan (1990) found that the number of previous entries by foreign investors had no influence on the entry mode. The authors explain that the lack of significance of experience in Japanese investor may be that they have less need for acquisitions, but they may feel more comfortable with making them.

In this study it will used four variables to test the international experience on the choice mode and we will consider that:

> *Hypothesis 7*: *The likelihood that an American food processing company will enter the EU market through acquisition mode will be positively associated with its own higher level of international experience.*

Product Diversification

Few studies involving the degree of product diversification as a characteristic of a company to decide the mode of entry in a foreign market have been done. Most of them (Caves and Mehra, 1986; Chatergee, 1990; Zejan, 1990 and Hennart and Park, 1993) consider the entrant relatedness to the new company, as we will see in next set of firm specific-variables related to competitiveness. Yip (1982) is one that we know that included this variable to explore

the factors which cause the companies to enter through acquisition or greenfield. He found a correlation between a parent firm's product diversification and the entry by acquisition.

However, Caves (1998) comments that an MNC with a high degree of product diversification might welcome joint ventures to develop certain products that the parent counts as peripheral, thereby letting it economize on managerial and other contributions to the venture. In this study, we will hypothesize that:

> *Hypothesis* 8: *The likelihood that an American food processing company will enter the EU market through joint venture mode will be positively associated with its higher level of product diversification.*

Competitiveness

Competitiveness I captures the capacity of the entrant's initial position to breach barriers in a foreign market, keeping in mind that competencies are firm-specific and very difficult to reproduce outside the firm's boundaries (Yip, 1982). The variables selected to represent competitiveness are R&D, investment in intangibles assets, relatedness and advertising.

Research and Development (R&D)

Research and Development (R&D) activities are the most important source of new knowledge for the MNC and have been used as a proxy of technological opportunities for the firm in terms of technological innovations and organizational capabilities. It has also been used, as a proxy for the relevance of the skill, routines and operational practices incorporated in human resources (Mutinelli and Piscitello, 1998).

It is suggested that R&D intensity increases a firm's likelihood to enter by new plant. Three basic arguments for that are posed: (1) developed products and/or processes, because of the failures of markets for information, incur the risks of dissemination of knowledge when

international transfer of tacit know-how is concerned (Buckley and Casson, 1976; Mutinelli and Piscitello, 1998); (2) the cost of this knowledge transfer to the external market is high, since they are riddled with uncertainty and hence, high transaction cost; and (3) once the firm has the organizational control of the subsidiary, it can transfer or devise its own management systems to a new and specific workforce. Those arguments were tested by Caves and Mehra (1986) and Hennart and Park (1993) in the Japanese MNCs' entries into the US and jointly confirm that R&D intensity disposes the firms toward greenfield entry.

However, it also has been noted by Teece (1986) and Legazkue (1999) that in high-tech industries, firms may gain advantages from linking innovative capability with complementary assets, typically lying downstream from production expertise. It has been true in large agricultural chemical, seed, grain and biotechnology companies that have been involved in a myriad of strategic alliances. Caves (1998), agrees that technology assets seem often to provide an important basis for firms' entries into joint ventures – either because different firms' technologies need to be combined, or because one's technology needs the cooperation of a different sort of asset (such as marketing skills). This remains consistent even with a MNC having concern for leakage and appropriation. Mutinelli and Piscitello (1998), in an empirical analysis with Italian firms, found that variables related to technological opportunities, non-codifiable skill and competences confirm the hypothesis that the need for access to complementary resources, and the inability of firms to acquire or build them, influence the propensity of the firm to go abroad through joint venture rather than acquisition mode. Then, we can state:

Hypothesis 9: *The likelihood that an American food processing company will enter into the EU market through joint venture mode will be positively associated with its R&D intensity.*

Intangibles Assets

Besides R&D activities, a firm's investment in intangible assets, such as goodwill and trademarks, also is important and is expected to capture the competitive position of a firm. To Moore (2004), when a company basic assets can significantly toward intangible, intellectual capital assets, such as brands, intellectual property, corporate reputation, and knowledge, new and different managerial competencies become the order of the day. Management need to know how to use those assets to capturing ideas and turn them into innovation and strategies planning such expansion of the firm.

In the food industry, when companies go to developed markets, such as EU countries, many agree that the most vital elements of continued success are innovation (both in product development and technology) and greater knowledge of the consumer (Byrne, 1997). Thus, firms characterized by higher investment in intangible assets may want to keep abroad their recognized brands, reputations, etc., acquiring leadership companies in that market. They may want their trademark to be identified as only one firm or group of related firms. Then, we expect those companies with superior management skill, or some specific knowledge or assets to act differently from R&D investments and may point away from joint ventures.

Hypothesis 10: *The likelihood that an American food processing company will enter the EU market through acquisition mode will be positively associated with its higher investment in intangible assets.*

Relatedness

The similarity of products between parent and subsidiary has been used in most models of the entry mode choice. When the parent company is diversifying through FDI, uncertainty and information costs may be higher, so that less-control ownership modes should be preferred. This view originated from Dubin (1976), who observed that the more remote the new activity, the greater its uncertainty and potential for costly mistakes, and the more likely is the MNC to pay for the greater security of entry by acquisition. Reur (1999) also explains that post-acquisition integration cost is high when indigestibility is substantial (i.e., firms have to "digest" targeted assets) due to resource indivisibility, cultural differences, and assets are embedded and shared in a large, complex corporation rather than isolated in a single business unit. Then,

> *Hypothesis 11*: *The likelihood that an American food processing company will enter the EU market through joint venture mode will be positively associated with its higher level of relatedness of the product between parent and subsidiary.*

Advertising intensity

The advertising variable is generally accepted as the best single indicator of the height of the differentiation barrier. Previous studies have assumed that high levels of advertising intensity should create a strong barrier to entry (Yip, 1982). They also show that this is another firm-specific advantage which the foreign investor can usually successfully combine with a foreign acquisition. Hennart and Park (1993) explain that, if this variable is a good proxy for marketing skills, then it could be expected that investors choose acquisitions because it will be possible for the foreign entrants to acquire local brand names and to combine them with their firm-specific marketing skill. In this study, it is especially important, since American food companies will

enter into a market with very uncertain demand, given their brand names been associated with the polemic non-acceptance to GMO products. Then,

> *Hypothesis 12*: *The likelihood that an American food processing company will enter the EU market through acquisition mode will be positively associated with its higher level of advertising intensity.*

Financial Firm Variables

Researchers have used financial characteristics of firm mostly to identify likely merger or acquisitions targets (Meador et al., 1996; Palepu, 1986), or to verify the efficiency effects of mergers (Rhoades, 1998). Louri (2001) included various financial variables in her model to examine the factors that determine the decision of multinationals to enter a foreign market through acquisition, but data were collected from the firm to be acquired. She explains that a firm must make use of every bit of available information concerning returns in order to form its expectations and that the target firm is a going concern, with a specific profile in terms of past profitability, indebtedness, capital intensity, liquidity assets and inventory. These variables, affect the expected returns from the target firm after its acquisition price is paid. The author concludes that when such firm specific variables are taken into account, the choice of the relative entry mode becomes easier to explain.

In this case, one is concerned with the financial strengths or constraints faced by a company when it has to decide on a mode of entry. Because entry aims to acquire resources and complementary assets in the foreign market, where the firm has to deal with many unfamiliar factors, it generally involves greater uncertainty and risk than do domestic investments (Caves, 1996). Many firms, which suffer from financial and managerial constraints, are then forced to

resort to co-operative agreements with host firms, which enjoy easier access to information channels and assets.

Chatterjee (1990) emphasizes another point of view about financial resources. She suggests that companies will use financial resources that require public valuation when there are relatively few differences in expectations between the capital market and the firms regarding the valuation of a project. Otherwise, firms will prefer the use of internal funds, and, to a large extent, low-risk debt that do not require public valuation, when deciding to invest in a project. High-risk debts and equity capital necessarily directly involve the capital market through investment bankers. If the capital market disagrees with a firm's internal valuation of a project, the cost of funds is likely to be high (Myers & Majluf, 1984). Then, to benefit its existing shareholders, Chatterjee (1990) comments that a firm should fund projects with internal funds or low-risk or low-cost debt that does not require public valuation.

The variables to be included in the model are Leverage, SG&A, Turnover and Capital Intensity. These will be addressed individually below.

Leverage

The proxy used for slacking financial resources is the firm's financial leverage. The non-availability of internal funds and/or non-ability to raise funds from low-default-risk (high leverage in turn implies a high risk of defaut) may indicate that a firm prefers a JV mode of entry to acquisition, because it does not want to be involved in a capital market through investment bankers. Reuer and Ragozzino (2004) explain that firms with low financial leverage tend to have unused borrowing capacity or internal funds that can be applied to corporate development activity without the need for going to external equity markets. Then,

Hypothesis 13: The likelihood that an American food processing company will enter the EU market through Joint Venture mode will be positively associated with its higher financial leverage.

Administrative Expenses

Selling, general and administrative expenses (SG&A) include all of the costs of operating the business, other than the costs of readying the product for sale. It consists of rent, insurance, electric, office supplies, telephone, salaries and benefits, interest, travel, entertainment, advertising, legal and accounting, licenses and permits, dues and subscriptions, maintenance and repairs, postage, insurance and credit card services.

Companies often overlook SG&A expenses or allow them to remain in a secondary, or possibly tertiary, position because selling expenses are a necessity in terms of operating a business. However, high SG&A expenses can be a serious problem for almost any business (Smartbiz, 2005).

Most agribusiness companies report their financial results from SG&A associated with mergers and acquisitions. In general, an increase in the SG&A costs occurs due principally to recently acquired plant or operations. This increase reflects the costs associated with developing a larger corporate staff to support acquisition efforts and expanded operations, including an expanded information system staff. Therefore, companies also relate their expectation on the total savings that will come from a rationalization of selling, general and administrative expenses, with the balance from, for example, leveraging the combined R&D platform or rationalization of manufacturing, supply and distribution.

Although some authors believe that comparing SG&A between companies is a difficult task because of the inconsistencies in categories and the differences in accounting classifications

(Smartbiz, 2005), in this study, this variable is used as a proxy for cost of utilization. A firm with high cost of SG&A may not want to acquire a new firm, since the probability of acquiring unwanted resources is larger if the two markets are related. To Lewis (1990), chances are that many aspects of a firm's administrative activities are similar to those of other firms. Then, a joint venture can be more attractive, because it allows the companies to link their resources selectively as needed and allows that firms sharing those tasks reduce the costs for members of an alliance. Therefore, a hypothesis about Administrative Expenses can be stated:

> *Hypothesis 14: The likelihood that an American food processing company will enter the EU market through Joint Venture mode will be positively associated with its higher cost of administrative expenses.*

Turnover

A firm which presents low turnover may indicate that current management has undertaken heavy investment but has been unable to generate sales growth, representing an inefficient use of assets. Alternatively, high turnover increases cash flow (Dietrich, 1984). Following the same rationality above, we can state:

> *Hypothesis 15: The likelihood that an American food processing company will enter the EU market through acquisition mode will be positively associated with its higher turnover.*

Capital Intensity Ratio

Past research has used capital intensity as a measure reflecting asset parsimony, which is the degree to which the firm's assets used per unit of output are few (Kotha and Nair, 1995). Asset parsimony, comments Spanos et al. (2004), is an added element in Porter's typology, which together with cost efficiency defines a measure of the firm's overall efficiency and hence

its emphasis towards lowering cost. Therefore, in our study, we will consider that lower values for the capital expenditures over sales signify success in cost efficiency and in asset utilization. Then, we may hypothesize that:

> *Hypothesis 16: The likelihood that an American food processing company will enter the EU market through joint venture mode will be positively associated with a higher capital intensity ratio.*

Table 3.1 to Table 3.3 summarizes these variables representing the factors of the host nation and of the parent firm that are said to influence the mode of foreign entry, together with respective descriptions and expected signs on the model of determinant entry choices. The positive sign (+) means entry by acquisition.

Methodology

This section describes the data and methods used in this study to test the hypotheses introduced in the conceptual model. A concise description of the econometric model is also provided. Lastly, the dependent and independent variables created from the data are presented.

Logistic Regression Model

Given the nature of the dependent variable, which represents the individual choice of each American Agribusiness company between two alternative modes of entry in the EU market, binomial logistic models offer the best approach to assess the determinant factors of the observed entry mode chosen.

Logistic regression describes the relationship between a dichotomous response variable and a set of explanatory variables. The explanatory variables may be continuous or (with dummy

Table 3.1: Country-Specific Variables and Expected Signs Relative to Acquisition

Variable Name	Description	Expected Signs
GEO	Geographic scope: Dummy = 0 if entry is in UK; Dummy = 1, otherwise	Dummy =1, GEO = -
GNP-CAP	The host country's GNP per capita as measure of income level.	+
FDI/GDP	Foreign business investment penetration in the local economy	+
RIRATE	Real Interest Rate	-

Table 3.2: Firm-Specific Variables and Expected Signs Relative to Acquisition

Variable Name	Description	Expected Sign
Characteristics:		
LOGEMP	Logarithm of the number of employees in a firm	-
STAG	Stage of the firm: Dummy = 0 if early/middle stage, Dummy =1, otherwise	Dummy =1, STAG=+
IEXP	Number of years since the firm setup its first foreign subsidiary	+
NSUB	Number of subsidiaries in EU countries	+
NSUBO	Number of subsidiaries in other countries that not in EU country	+
INTSALES	The percentage of sales to foreign markets over total sales for a firm	-
DIV	Firm's product diversification: Dummy=0 if firm possess less than 3-digit; Dummy=1, otherwise	Dummy=1, DIV= -
Competitiveness:		
RND	R&D expenditures as a percentage of total sales.	-
PERINT	Percentage of intangible assets over total assets	+
RELTN	Dummy variable – relatedness between the entrant and the new investment	-
ADVA	Advertising expenses over total assets	+

Table 3.3: Financial-Firm Variables and Expected Signs Relative to Acquisition

Variable Name	Description	Expected Sign
LEVER	Long-term debt over total assets	-
ADMEXP	Selling and general administrative expenses	-
TURNOV	Total sales over total assets	+
CAPSAL	Capital expenditure over total sales	-

variables) discrete. Maximum likelihood estimation is applied after transforming the dependent variable into a logit variable (the natural log of the odds of the dependent variable occurring or not). In this way, logistic regression estimates the probability of a certain event occurring, by calculating changes in the log odds of the dependent, not changes in the dependent variable itself (Garson, 2000).

To understand how logistic regression works, suppose one wants to estimates the probability of an event occurring (i.e., probability of a mode of entry be chosen). It can be expressed as:

$$prob(event) = \frac{e^{\beta_0+\beta_1 X_1+\beta_1 X_1+\beta_2 X_2+\ldots+\beta_n X_n}}{1+e^{\beta_0+\beta_1 X_1+\beta_1 X_1+\beta_2 X_2+\ldots+\beta_n X_n}},$$

or equivalently, (3.1)

$$prob(event) = \frac{1}{1+e^{-\beta_0+\beta_1 X_1+\beta_1 X_1+\beta_2 X_2+\ldots+\beta_n X_n}}. \quad (3.2)$$

The probability of an event not occurring would then be:

$$prob(no\ \text{event}) = 1 - prob(event). \quad (3.3)$$

Now,

$$prob(event) / prob(no\ event) \quad (3.4)$$

is simply the *odds ratio*, and not the probability, of an event occurring.

Then, if one takes the logarithm of the expression for the odds ratio (3.4), the logistic regression model becomes what is known as the logit model:

$$Log\{prob(event) / prob(no\ event)\} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots \beta_n X_n, \quad (3.5)$$

where, the log of the odds ratio is not only linear in X, but linear in the parameters also (which is crucial) (Gujarati, 1988) or equivalently,

$$prob(event) / prob(no\ event) = e^{(\beta_0+\beta_1 X_1+\beta_1 X_1+\beta_2 X_2+\ldots+\beta_n X_n)} \quad (3.6)$$

Overall Model Fit

Goodness-of-fit tests are available as indicators of model appropriateness and to test the significance of individual independent variables. The most common assessment of overall model fit in logistic regression is the *global chi-square* test, also called the log-likelihood test, which is simply the chi-squared difference between the null model (i.e., with the constant only, no explanatory variable) and the model containing one or more predictors. It is calculated by taking twice the positive difference in the two log-likelihoods (-2LL). It is an assessment of the improvement of fit between the predicted and observed values on dependent variable by adding the predictor(s). A well-fitting model is significant at the .05 level or better (Allison, 2003).

The second is *Score* statistic, which is a function of the first and second derivatives of the log-likelihood function under the null hypothesis. Jennings (1986) reports that in large samples, there is no reason to prefer either of these statistics, and they will generally be quite close. In small samples, or samples with extreme data patterns, there is some evidence that the likelihood ratio chi-square is superior.

Wald statistic is another test commonly used to test the significance of individual logistic regression coefficients for each independent variable (that is, to test the null hypothesis in logistic regression that a particular logit (effect) coefficient is zero). It is the ratio of the unstandardized logit coefficient to its standard error. Menard (p. 39) warns that for large logit coefficients, the standard error is inflated, lowering the Wald statistic and leading to Type II errors (false negatives: thinking the effect is not significant when it is). That is, there is a flaw in the Wald statistic such that very large effects may lead to large standard errors and small Wald chi-square values. For models with large logit coefficients or when dummy variables are involved, it is better to test the difference in model chi-squares for the model with the

independent and the model without that independent. Also note that the Wald statistic is sensitive to violations of the large-sample assumption of logistic regression.

It is essential to keep in mind that there are many ways of approaching model evaluation. *Deviance chi-square* (-2LL) is another method that can be used for assessing the significance of logistic regression. It is analogous to the use of the sum of squared errors in OLS regression, since it reflects error associated with the model even after the independent variables are included in the model. To Allison (2003), such statistics implicitly involve a comparison between the model of interest and a "maximal" model that is more complex. The maximal model always fits better than the model of interest – the question is whether the difference in fit could be explained by chance.

Two other statistics are also useful in comparing the relative fit of different models. By adding 2*k* to the deviance (where *k* is the number of parameters), we can calculate the *Akaike Information Criterion* (AIC), and the *Schwartz criterion* (SC) is equal to -2LL + k log *n* where *n* is the sample size. Both statistics "penalize" the log-likelihood for estimating more parameters. In general, lower values of these statistics correspond to more desirable models (Allison, 2003).

Statistic Measuring Predictive Power

In OLS regression, predictive power is usually measured by the coefficient of determination, commonly known as R^2. In the logistic regression, there are many measures which describe how well one can predict the dependent variable based on the values of the independent variables. One of them it is based on the likelihood ratio chi-square. While the generalized R^2 may behave quite similarly to the linear model R^2, it cannot be interpreted as a proportion of variance explained by the independent variables. Also, its upper bound is less than 1 because the dependent variable is discrete (Allison, 2003).

Another procedure statistic that is reported in many logistic studies is based on ordinal measures of association. The success of the logistic regression can be assessed by looking at the classification table, showing correct and incorrect classifications of the dichotomous dependent variable.

Interpreting the logit coefficient

Interpreting the coefficients in the logistic regression is not as easy as for the coefficients in the linear probability model, except for sign (Allison, 2003). Consider the following example to interpret the meaning of a logistic regression model. Suppose that after running a model with two variables, where one is a dummy variable (i.e., gender, where women is set 1) and another is a quantitative variable, one finds the values of 0.5952 and 0.1871 for the first and second parameter β estimates, respectively. Their odds ratios of 1.813 and 1.206 are obtained by computing e^{β} and show that the predicted odds of an event occurring for women is 1.813 times the odds for men. In other words, the odds of an event occurring for women are 81% higher than the odds for men. Now, for the second variable, it is helpful, following Allison (2003), to subtract 1 from the odds ratio and multiply by 100 or, equivalently, take $100(e^{\beta}-1)$. This shows that the percent change in the odds for each unit increase in the independent variable. In this case, one finds that a unit increase in this quantitative variable is associated with a 21% increase in the predicted odds of an event occurring.

Data sources

Information from US companies that use GMO products in processing food products and have invested in the EU market will be used to examine the best strategy for entering foreign markets. The companies to be studied in the period of 1990 to 2003 belong to the major group 20

of the Standard Industrial Classification (SIC) Code[1]; specifically, those four digits regarding corn and soybean products (See Appendix Table 2). This period was chosen because, before 1980, a substantial portion of food company acquisitions were in non-food industries. After this period, the response of financial markets was positive to mergers and acquisitions in the food industry (Weston and Chiu, 1996). Moreover, the period covers the year of introduction of GMO crops in the US, which was in 1996.

The diverse sources consulted for collecting data include: Securities Database, Mergers and Acquisitions, American Global Access, Hoovers, Thomson Financial Services Data, Mergent, Agricultural Statistics and individual companies' annual reports. Of 198 companies selected by SIC code, 20 have invested in foreign subsidiaries in the EU and only 9 companies have completed available information regarding their operations. Those companies are presented in Appendix, Table 3.

Description and Measurement of Variables

A detailed description and measurement of the set of variables designed to test the propositions and hypotheses introduced in the conceptual model is provided.

Dependent Variable:

MODE of entry is captured by a dummy variable which takes a value of one if the firm entered a foreign market via acquisition and zero if entered through a joint venture.

Independent Variable

The independent variables are divided into two groups: country specific and firm specific factors.

[1] This code has been replaced by the North American Industry Classification System (NAICS) since 1997. The numbers equivalent to the SIC codes are also presented in Appendix, Table 2.

Country-Specific Factors:

GEO – Geographic scope is treated following McNaughton (2001) as a unique property of a country which includes cultural distance and demand uncertainty. This variable is operationalized as the country in which the European partner is located: (0) UK, (1) other countries in the EU.

GNP-CAP – the host country's GNP per capita as a measure of income level. The higher the level of development measured by the GNPCAP, the easier it is to find firms that fit the acquisition requirements like technological or managerial attributes of a MNC (Caves, 1998).

FDI/GDP - Foreign business investment penetration in the local economy. It is expected that in the nations characterized by a higher penetration of FDI, the firm will choose higher control and equity-based modes such as acquisitions.

RIRATE _ Real Interest Rate is a proxy for the cost of investing in fixed capital. The average cost of new subsidiary should increase if the opportunity cost of investing in fixed capital increases. A higher interest rate in the target country increases the attractiveness for acquisition.

Firm Specific Variables

Characteristics of the Firm:

- Size - Variable to capture the size of the firm:

  LOGEMP – Logarithm of the number of employees in a firm.

- Stage – Dummy variable to capture the processing (value-added) stage of a company.

  STAG = 0 if the company is in the early or middle stage and STAG = 1 if it is in the latter stages.

- International Experience – Variables to capture the international experience of the firm and its extension of distribution channels:

  IEXP – Number of years since the firm setup its first foreign subsidiary. IEXP = $\log(y_e - y_0 + 1)$, where y_e is the year of the current entry and y_0 the year in which the parent company first engaged in FDI.

  NSUB – Number of subsidiaries in EU divided by the global total including the home nation.

  NSUBO – Number of subsidiaries in other countries not in an EU country divided by the global total, including the home nation.

  INTSALES – The percentage of sales to foreign markets over total sales for a firm.

  DIV - Dummy variable used to capture the degree of product diversification. The dummy variable is equal to one if the firm possesses more than three different 3-digit SIC codes from that of parent prime product line. The dummy variable is equal to 0 otherwise. Products that do not belong the Food industry SIC code are not considered.

Competitiveness of the Firm:

- R&D – Variables to capture the technological intensity of the parent company:

  PERINT – Percentage of intangible assets (goodwill, trademarks, for example) over total assets.

  RND – Research and development expenditures of the parent company as a percentage of total sales.

- Relatedness

  RELTN – Dummy variable to capture whether the entrant is investing in products

related to parent company products. The dummy variable is equal to 1 if the foreign firm involves the same three-digit SIC code as the parent firm, 0 otherwise.

- Advertising

ADVA – Advertising expenses of the parent company as a share of assets in the firm.

Financial Performance Variables:

- Leverage

LEVER – Long-term debt over total assets. Low debt ratios may mean unutilized debt capacity of a potential target, meaning a reduction of cash costs to acquiring firm's shareholders through issuance of debt.

- Administrative expenses (SG&A)

ADMEXP – Variable expected to capture all of the costs of operating the business other than the costs of readying the product for sale, such as rent, insurance, salaries and benefits, travel.

- Turnover

TURNOV – Total sales over total assets. Low turnover represents inefficient use of assets. It may indicate that current management has undertaken heavy investment but has been unable to generate sales growth. Alternatively, high turnover increases cash flows.

- Capital Intensity Ratio

CAPSAL – Capital expenditure over total sales. This variable is expected to capture the firm's overall efficiency.

Descriptive Statistics

Table 3.4 provides descriptive statistics for both the dependent and independent variables employed in this study. Values for the minimum, maximum, mean and standard deviation of the variables are provided.

Discussion of the Results

In this section, results concerning the determinants of mode of entry of the US agribusiness companies are presented. The findings address the hypotheses presented in the conceptual framework. They are discussed simultaneously with the findings obtained in the logistic regression model. First we will discuss the many tests of goodness of fit for the models. If one has noted, we have worked with longitudinal (panel) data since we have the same company's observations measured at the same and at different years of entry time. Actually, we have assumed that all observations are independent – that is, the outcome for each observation is totally unrelated to the outcome for every other observation. Our data is particularly different in the way that it can be grouped into natural or imposed clusters, with observations in the same cluster tending to be more alike than observations in different clusters. If we record an individual's responses at multiple points in time, we ordinarily expect those observations to be positively correlated. Allison (2003), explains that even with dependence among the observations, the coefficients should be consistent estimates of the true coefficients, and, therefore, approximately unbiased. However, it is not efficient. To accomplish this, we will first estimate the model without any special treatment for dependence among the observations, and in the next chapter we will discuss and apply the generalized estimating equations, a method for clustered data.

Table 3.4: Descriptive Statistics for Independent Variables

Variable	Units	N	Mean	Std Dev	Sum	Minimum	Maximum
MODO	Dummy	69	0.71014	0.45702	4,900,000	0	100,000
GEO	Dummy	69	111.594	0.89994	7,700,000	0	100,000
GNPCAP	US$	69	10,404,638	1,718,477	7,179	6,350,000	18,020,000
FDIGDP	US$	69	382,464	349,670	26,390,000	0.10000	1,300,000
RIRATE	Percent	69	742,388	242,331	49,740,000	350,000	1,400,000
LOGEMP	Log Unit	69	171,092	0.36766	11,805,322	11,038	257,054
STAG	Dummy	69	0.55072	0.50106	3,800,000	0	100,000
IEXP	Log Year	69	154,808	0.21379	10,681,741	0.84510	194,939
NSUBO	Unit	69	2,724,767	1,736,629	1,880	213,523	6,936,183
NSUB	Unit	69	7,275,233	1,736,629	5,020	306,381	9,786,477
INTSALES	US$	69	2,409,139	1,312,826	1,662	0	4,707,352
DIV	Dummy	69	0.50725	0.50361	35,000,000	0	100,000
RELTN	Dummy	69	9,652,073	3,484,697	6,660	2,574,000	24,243,674
RND	US$	69	0.65503	0.35680	4,519,730	0.08686	151,752
PERINT	US$	69	2.240.432	1.666.577	1,546	0.53426	6,462,685
ADVA	US$	69	0.46640	0.68203	3,218,163	0.00544	240,000
LEVER	US$	69	0.21603	0.10018	1,490,584	0.04447	0.41577
ADMEXP	US$	69	2,403,754	1,115,925	1,659	148,000	5,600,000
TURNOV	US$	69	130,038	0.43077	8,972,646	0.26315	225,629
CAPSAL	US$	69	666,946	576,714	46,019,256	157,099	3,464,662

In this chapter, a logistic regression analysis enabled us to test the above 16 hypotheses and identify, within the two sets of factors, host country factors and firm related factors, which variables most strongly influence the choice of the mode of entry. Before performing the logistic regression model, a correlation test was conducted among the independent variables to check for the possibility of problems associated with multicollinerity. We follow Allison's (2003) instructions to check the possibility to have high correlation among the independent variables. Table 1 in the Appendix shows the correlation test for all variables in the model. As indicated in the Table 3.2, the Pearson correlation test shows that the variables are not significantly related. Also, the Variance Inflator Factors (VIF) for all independent variables was computed. Most of them presented values lower than 10, indicating that the logistic regression can be interpreted with reasonable confidence.

Given the relatively reduced number of observations and potentially a quite large number of independent variables, it was necessary to select small subsets of independent variables representing each full set, in order to minimize correlation and to enlarge the number of degrees of freedom. Then, we run each set of explanatory variables on the dependent variable and select the variables which were most correlated with the dependent variable and had the more stable parameter coefficient signs. In the second set, firm-related factors, the variables were divided, as shown in Figure 3.1, into two groups – Firm-specific factors and Firm financial factors – before running the regression model, because they presented more explanatory variables than the first set. This procedure resulted in a select number of variables, which is a reasonable number to work with, representing each set of factors. We start with 19 independent variables and the end result includes 14 independent variables. The variables eliminated were those from the host country factors and LEVER from the firm financial performance.

After regressing the logistic regression for this group of variables modeled, we present our results in five different equations, given that, although all variables showed stability in the signs of their coefficients in many different formulations, the level of significance behaved differently. The results are presented in Table 3.5. The stepwise procedure used to select the model by prior testing as well as to estimate the parameters in the final specification is called pretest or sequential estimation (Wallace, 1977). Given the nature of data and the objectives to test a large number of hypotheses, the procedure used led us to obtain significant results about the choice of the entry mode. The results for the variables that were eliminated are presented in Table 5 in the Appendix.

All the logistic regression models with respect to the mode of entry presented a highly significant ($p<0.001$) Chi-square and Score test in all equations as a goodness-of-fit tests, an

indicators of model appropriateness and of significance of individual independent variables. For the Score test, the equation 2 was significant al the 0.01 level. The Wald test that is very sensitive to violations of the large-sample assumption of logistic regression did not perform well for the equation 1. For equations 2, 3 and 4, it was significant at the 0.05 level. If one compares the associations between the predictions and the observed outcomes in the table, one can observe that all models seems to fit very well, since more than 90% of the arguments are correctly classified, with exception of equation 4 that are 88.7%. With respect to the Deviance test, which involves a comparison between the model of interest and a model that is more complex, all the models demonstrated a high level of fit. The p-values for equations 1 and 3 are greater than 0.90. The discussion that is following will be based on the hypothesized set of variables used to predict the determinants of entry into EU markets.

Host Country Factors

Host country variables did not perform as well as expected. Although all the estimated coefficients signs supported our hypotheses, with exception of GEO, they were not significant and consequently, their presences in the model decrease the level of significance of the parameters. Were the estimated coefficient for those variables significant we could analyze the results in the following way. The dummy variable GEO, positively related to the acquisition mode, contrary with our prediction, show that American companies prefer to enter the other countries, that not into UK market by acquisition, and by joint venture in the UK. Although this finding contradicts a consensus in the literature on cultural distance (Kogut and Singht, 1988; Kim and Hwang, 1992), it is pertinent if we consider that the greater the cultural distance between nations, greater also the "…inadequacy of partner's ability to absorb knowledge at a high socio-cultural distance or the incompatibility of his routines" (Contractor and Kundu, 1998).

Estimated GNPCAP with a positive coefficients shows that firms prefer to enter by acquisition in countries with a higher level of economic development. FDIGDP, also positive, supports our third hypothesis that states that the higher ratio of FDIGDP attracts other firms to enter by acquisition mode. Finally, the variable RIRATE supported our hypothesis, and suggests that companies may decide to enter by joint venture when there is a higher interest rate in the host country, increasing the attractiveness for low equity because of the rise in the cost of investing in fixed capital.

As can be seen, we find evidence that American agribusiness companies operating in EU appear not to choose their mode of entry based on host country factors. This finding is not without precedent in the empirical literature, as we discussed in the hypothesis formulation for host country factors. The main reason we believe that those country-specific variables poorly influence American companies is because the host countries in this study together form an economic block – EU. Thus, most of those characteristics are similar with respect to development and uncertainty of market demand. Another point to be noted is that the companies from our sample data had at least four years of experience in these foreign countries, which implies that culture, business practices, currency, etc, would not be a difficult to manage.

Firm-Specific Factors

Estimated coefficients for all independent variables selected to compose the subset of firm-specific factors, excepting NSUB, representing international experience and ADMEXP, supported the predicted hypotheses.

Characteristics of the firm

Explanatory variables representing the characteristics of the firm had significant coefficients, basically, in all equations. The coefficient of the variable LOGEMP was negative

and significant, supporting the hypothesis that the larger the size of the US food companies, the more likely that entry in EU countries will be through joint ventures. This finding suggests that many firms have concluded that they can be "big", not necessarily via controlled, equity investments, but by building a network of alliances (Contractor and Kundu, 1998).

The findings for the dummy STAG confirmed our hypothesis that firms which are engaged in the early or middle stages of making a processed food product show greater likelihood of entry by joint venture, while those engaged in the later stages demonstrate a greater likelihood of entry by acquisition. Such a response to these variables has not been tested in any other studies, to our knowledge, and may be especially pertinent to food industries. However, Stopford and Wells (1972) show that MNCs based in extractive sectors, such as in our study, in the early stage might seek partners in the foreign country to process their output, since the parents lack the needed managerial know-how for competing in the new market.

The variables tested to capture the international experience of the firm and its extension of distribution channels as determinant of mode of entry show that IEXP, as expected, supported our hypothesis, presenting positive and significant sign, showing that MNCs with a long history since making their first entry into the EU prefer to make their additional entries through acquisitions. Accordingly, the MNCs that have a greater number of subsidiaries in other countries that are not in the EU (NSUBO) also tend to have the same preference, due to the necessity to be well established in the EU market. On the other hand, MNCs which already possess a large number of subsidiaries (NSUB) in the EU and a high level of international sales (INTSALES) are more likely to prefer joint ventures as the mode of entry.

Although there is no comparable study that has used the INTSALES variable to capture international experience of the company, we may speculate that American food companies with

large extensions into international distribution channels and having a larger number of subsidiaries in the EU do not need to acquire more companies in those countries in order to increase sales through distribution expertise that they already have gotten from their subsidiaries. Thus, from these international experience activities, we can suggest that the LOGIEXP variable, broadly used by researchers as a determinant of mode of entry, may not be as appropriate an indicator as expected. It is important to know, in addition to the time since the firm made its first entry, the number of subsidiaries and their expertise in distribution channels. However, it is also important to note that this finding seems to be a feature peculiar to food industry firms, which involve very specific distribution activities and reach countries that form a very consolidated economic block, such as the EU block.

The estimated coefficient for DIV was positive and significant, supporting our hypothesis that a high degree of product diversification might welcome joint ventures.

Competitiveness

The results associated with the competitiveness explanatory variables provide a very good support to our hypothesis, with exception of RELTN. Estimated RND results show a significant and negative sign, suggesting that R&D intensive firms are more likely to enter by joint venture, confirming our hypothesis that the mode joint venture either depends on different firms' technologies to be combined, or because one's technology needs the cooperation of a different sort of asset (such as marketing skills). An empirical example is a partnership between two large and intensive R&D companies, General Mills and Nestlé, to produce a breakfast cereal, a product which represents a very specific technology developed from each company.

PERINT and ADVA also had the expected signs, giving us evidence that firms which have intense intangibles assets and advertising will choose their entry by acquisition mode. As

we suggest before, it could be expected that investors choose acquisitions because it will be possible for foreign entrants to acquire local brand names and to combine them with their firm-specific marketing skill. In the case of GMO product's uncertainty demand, acquiring leadership companies in that market will help a firm that needs greater knowledge of the consumer to keep abroad their recognized brand, and reputations front for this new market.

RELTN variable confirms our hypothesis about the trends toward joint venture, since the activities do not consist in uncertainty and costly mistakes relative a new activity to the company. The firm can then select the resources they want through a joint investment. It also shows that an entry into a related market allows a foreign firm the possibility of enjoying a competitive advantage on at least some dimensions by virtue of shared resources (Yip, 1990).

Financial Variables

Most of the firm financial variables performed as we expected. LEVER and TURNOV presented multicolinearity and were not used in the same equation. TURNOV performed better in those equations showing that a firm which presents higher turnover tends to enter in foreign market by acquisition, since it indicates that current management has been using assets in an efficient way and so there are no financial problems to invest in new equity. On the other hand, LEVER was not significant, but its negative sign (see Table 5 in the Appendix) show that firms with high financial leverage may have already used their internal funds and have to apply to corporate development activity going to external equity markets. Following research from capital markets, such as Chatergee (1990) and Kasuga (2003), because the cost of external funds is higher than that of internal funds, the level of investment is affected and a joint venture is established when the parent firm's net worth is relatively small.

CAPSAL coefficient was negative as expected and significant in equation 1 at the 0.05 level. Thus, we may say that firms with lower ratios for capital expenditures over sales are very successful in cost efficiency and in asset utilization, and they will more likely choose the joint venture mode of entry to keep this low-cost strategy. ADMEXP was significant but positive, and contrary to what we expected did not support our hypothesis that a high level of ADMEXP encourages acquisition. That is, the idea that firms with high levels of SG&A may not want to acquire a new firm because they could increase the probability of acquiring unwanted resources was not supported. The rationale for the observed pattern could be found in two bases. First, the acquisitions made are not in the same business and the probability of acquiring unwanted resources is not greater, if it is the case that the two markets are not related. Secondly, the company may not be concerned with only the SG&A costs. They often overlook SG&A expenses or allow them to remain in a secondary or possibly tertiary position, because selling expenses are a necessity in terms of operating a business (Smartbiz, 2005).

Finally, we added two interaction variables, between ADMEXP and RELTN and ADMEXP and DIV, to verify again the statement described before that the probability of acquiring unwanted resources when the market is related, or when the firm is diversified, makes the MNC prefer joint ventures if it has high SG&A. Surprisingly, the signs for the both interactions is significant but positive, confirming the idea that even when the market is related or the firm is diversified and the SG&A is high, the US firm may choose acquisition. Regarding the second interaction, Hennart and Park (1993) already had mentioned that, the main advantage of diversified firms may consist in sophisticated management control systems. This advantage is embedded in senior managers, and thus generally compatible with quasi-independent subsidiaries managed by local personnel. Its exploitation can therefore be achieved through

acquisitions. This is a frustrating finding, because we were most convinced that high ADMEXP could be determinants for a firm to choose a joint venture entry. It may be interesting to check how this SG&A influences the firm performance after it makes its entry[2].

Conclusions

The conceptual framework used in this chapter led us to assessing the US food processing companies' determinant factors of the observed entry mode chosen in the European Union countries. The binomial logistic model confirmed to be a good approach to make this analysis of the determinant factors of the entry mode.

The results from those equations are robust and consistent with our theories. They suggest that American food companies operating in EU appear not to choose their mode of entry based on host country factors. This finding is not without precedent in the empirical literature. Therefore, their entries are driven most on firm related factors (firm-specific factors and firm financial performance).

In firm-specific factors, all hypothesized characteristics of the firm had significant estimated coefficients in all specifications. The larger the size of the US food companies, the more likely that entry into EU countries will be through joint ventures. Also, firms engaged in the early or middle stage of making a processed food product show a greater likelihood towards joint venture, while those engaged in the later stages demonstrated a greater likelihood toward acquisition. International experience presented an interesting result. MNCs with a long history since making their first entry into the EU and had a great number of subsidiaries in other countries that are not in an EU country prefer to make their additional entries through acquisitions. However MNCs which already possess a large number of subsidiaries in the EU and a high level of international sales likely prefer joint ventures as the favored mode of entry.

[2] This variable was tested in the chapter of Entry Mode Effects on Profitability.

This finding is the same for firms with a high degree of product diversification. Regarding the competitiveness of the firms, R&D intensive companies presented a greater likelihood of entry towards joint venture, but firms which have greater intangibles assets and advertising ratio chose their entry more likely by acquisition mode. However, when there was a higher similarity of products between parent and subsidiaries in EU, the likelihood of entry was toward joint venture.

Firm financial performance results show that firms which presented higher turnover are more likely to enter into foreign markets by acquisition. The estimated coefficient implies that current management has been using assets in an efficient way, and there are no financial problems to investing in new equity. On the other hand, the proxy used for slack financial resources was not significant. However, we may say, based on these findings, that firm with lower ratios for capital expenditures over sales and are very successful in cost efficiency and in asset utilization choose the joint venture mode of entry to keep this low-cost strategy. SG&A did not support our hypothesis. High levels of SG&A encouraged acquisition. Neither was our hypothesis supported when we added two interaction variables to verify that the probability of acquiring unwanted resources when the market is related, or when the firm is diversified, makes the MNC prefer joint ventures if it has high SG&A.

As we have seen, most findings above may be very specific to the agricultural and food industry. Although it was not a pretension in this study to make comparison with other industries in the manufacturing sector as whole, we are convinced that, based on our specific sample of companies, we found the main factors of US agricultural and food processing company that determine the mode of entry into EU countries.

Table 3.5: Results of Logistic Regression Analysis of the US Food Firms' Mode of Entry into EU, 1990-2003[a]

Variables	Mode of Entry			
	Equation 1	**Equation 2**	**Equation 3**	**Equation 4**
Intercept	-49.439 *	8.527 **	-15.334 *	1.432
LOGEMP		-8.924 **		
STAG	19.138 *		12.555 **	
IEXP	27.151 *			
NSUB		-0.146 *		
NSUBO				0.180 *
INTSALES	-0.404 *			
DIV			-10.691 *	
RND	-17.047 *	-2.755 *	-9.578 *	
PERINT	0.215 *	0.262 **		0.253 **
RELTN			0.025	-0.087 **
ADVA			4.140 *	
ADMEXP		0.341 **		
TURNOV	19.795 *	6.200 *	9.447 *	5.756 *
CAPSAL	-1.027 *			
ADMDIV			0.450 *	
ADMREL				0.002 **
LL Ratio	51.521 ***	34.246 ***	38.926 ***	35.405 ***
Score	31.994 ***	17.906 **	28.304 ***	19.634 **
Wald	8.793	11.865 *	12.492 *	13.315 *
Deviance	0.99	0.84	0.89	0.81
%Concordant	95.6	90.1	90.9	90.3

[a] n = 69; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

CHAPTER 4

AN APPLICATION OF GENERALIZED ESTIMATING EQUATIONS TO THE ANALYSIS OF DETERMINANT FACTORS OF THE ENTRY MODE

Introduction

Studies of Foreign Direct Investment (FDI), where the aim is to identify determinants of foreign market entry decisions, have consistently presented different findings for the same explanatory variables, leading researchers to make incorrect interpretations in identifying mode of entry.. One explanation for those misleading results is the nature of data used in the analysis and the treatment given to them.

The same conceptual framework used in the previous chapter for the analysis of the determinant factors for entry mode is used here. However, the model is estimated using a special treatment for dependence among observations, since longitudinal data are used where company responses are recorded at multiple points in time.

For a conventional logit analysis, a crucial assumption is that observations are independent; that is, the outcome for one observation is completely unrelated to the outcome for any other observation. If, over a period of time, we measure the same dichotomous variable entry mode choice for companies at regular intervals, it would be very unlikely that a company's decision in one period would be independent of the earlier or later entry mode chosen. Thus, without taking into account such correlations, one could be led to seriously biased standard errors and test statistics. The GEE method can ameliorate this problem (Allison, 2003).

First, the approach used to estimate Generalized Estimating Equations (GEE) is discussed for these kinds of analyses. Next, the method is applied to estimate a model of US food company decisions on entering the EU market for the period from 1990 to 2003.

Generalized Estimating Equations

GEE was introduced by Liang and Zeger (1986) as a method of estimating regression model parameters when dealing with correlated data, or distributed response variables collected within subjects over time. Regression analysis using the GEE methodology is a common choice when the outcome measure of interest is discrete (e.g., binary or count data, possibly from a binomial or Poisson distribution) rather than continuous. GEEs are an extension of generalized linear models, which facilitate regression analysis of dependent variables that are not normally distributed (Ballinger, 2004).

To define a regression model using the GEE methodology, one needs to define the following: The distribution of the dependent variable (which must be a member of the exponential family); the link function; the independent variables; and the covariance structure of the repeated measurements. Following Ballinger (2004), GEE starts with maximum-likelihood estimation of the regression parameters (β), and the variance is calculated using a link function,, which is a transformation function that allows the dependent variable to be expressed as a vector of parameter estimates in the form of an additive model. The link function in our case is the logit link for binary response variables. The covariates would be transformed by the log of the odds ratio (ratio of a response of "1" in the data to a response of "0"). The GEE also uses a variance function that is a transformation matrix, with a value calculated from the observed mean, that is used in calculating the variances of the parameters that permit nonconstant variances for values of the mean because they can depend on a specified function of the mean. If we assume that the

data are correlated, the variances are multiplied by a working matrix of correlation coefficients that corrects for correlation within subjects or panels. If we assume the observations are independent, this variance matrix is then transformed into a column of error terms through matrix multiplication with an identity matrix, which has all 1s on the diagonal and, therefore, produces no change in the parameter estimates (Ballinger, 2004).

Regarding the covariance structure (that is, the specification of the form of correlation of responses within subjects in the sample), it is important to note that it is this working correlation matrix that allows GEE to be used to estimate models that account for the correlation of the responses (Liangt & Zefer, 1986). Ballinger (2004) asserts that decisions about correlation structure should be guided first by theory. For example, for data that are correlated within cluster over time, an autoregressive correlation structure is specified. If there is no logical ordering for observations within a cluster, an exchangeable correlation matrix should be used. Also, if we want to permit the free estimation on the within-subject correlation, an unstructured working correlation matrix estimates all possible correlations between within-subject responses and includes them in the estimation of the variances.

Determinants of the Mode of Entry

In this study, we consider that MNCs' choices are influenced by two types of factors: host country-specific factors and firm-related variables, which are further divided into firm-specific variables related to resource factors and firm-specific variables related to financial and performance factors. To develop an analysis of the market entry decision, 16 theoretical hypotheses, specifically for the food industry, were developed in the last chapter. We will test the same hypotheses for all the type of factors that influence the company's choice by applying GEE.

Methodology

This section describes the data and methods used in this study to test the hypotheses introduced in the conceptual model. A concise description of the econometric model is also provided. The dependent and independent variables created from the data are also presented.

Estimation of GEE

In ordinary logit analysis, the maximum likelihood estimates can be obtained by an algorithm known as iteratively reweighted least squares. Allison (2003) explains that each step in the algorithm is accomplished by weighted least squares, with both the weights and the constructed dependent variable changing at each iteration as functions of the results at the last iteration. In the matrix formulation of the weighted least squares, there is a weight matrix W, which has off-diagonal elements equal to 0 and diagonal elements equal to $p_i(1-p_i)$ where p_i is the predicted probability from the previous iteration. The GEE algorithm extends this approach to do iterative generalized least squares. In this method, the matrix W has nonzero off-diagonal elements that are functions of the correlations among the observations. These correlations are re-estimated at each iteration, based on correlations among the Pearson residuals.

Table 4.1 gives the information about the GEE model that we are estimating. We start the estimation defining the subject effect, which is a variable that contains a unique identification code for each cluster. Our variable is the company. It is assumed that observations are independent between clusters and correlated within the clusters. The within-subject effect names a variable that distinguishes different items within a cluster. In this application, the items are distinguished by different times, the year in which the company made an entry into the EU. The period of years ranged from 1990 to 2003. Because many companies had different entries in the same year, and the number of within-subject entries was not at the same level as for subjects, we

had to reduce the number of observations. The type of the structure of the correlation matrix among the observations within each cluster used was UN, for unstructured. Finally, the distribution used was a binomial.

Table 4.1: GEE Model Information

Correlation Structure	Unstructured
Within-Subject Effect	Year (14 levels)
Subject Effect	Company (9 Levels)
Number of Clusters	9
Correlation Matrix Dimension	14
Maximum Cluster Size	7
Minimum Cluster Size	3

Data sources

The companies to be studied in the period of 1990 to 2003 belong to the major group 20 of the Standard Industrial Classification (SIC) Code[5]; specifically, those four digits regarding corn and soybeans products (Appendix Table 2). The diverse sources consulted for collecting data include: Securities Database, Mergers and Acquisitions, American Global Access, Hoovers, Thomson Financial Services Data, Mergent, Agricultural Statistics and individual companies' annual reports. Of 198 companies selected by the SIC code, only 20 have invested in foreign

subsidiaries in the EU and only 9 companies have completely available information regarding their operations. Those companies are presented in Appendix Table 4.

Description and Measurement of Variables

Dependent Variable:

MODE of entry is captured by a dummy variable which takes a value of one if the firm entered a foreign market via acquisition and zero if entered through a joint venture.

Independent Variable

The independent variables are divided into two groups: country-specific and firm-specific factors. Table 4.2 to Table 4.4 summarizes these variables representing the factors of the host nation and of the target firm that are posited to influence the mode of foreign entry, together with their respective descriptions and expected signs on the model of determinant entry choices. A positive sign (+) on the coefficient means that variable demonstrates an increased likelihood of entry by acquisition.

Discussion of the Results

In this section, results of the application of GEE in estimating the determinants of mode of entry of US agribusiness companies are presented. The findings address the hypotheses presented in the conceptual framework. For purposes of comparison of regression results under different analyses, two regressions will be run for equation 5: one by the ordinary logistic regression method and another using GEE.

The results of GEE analysis of the US food firms' mode of entry into EU in the period of 1990-2003 are presented in Table 4.5 in five different specifications. Although all variables

[5] This code has been replaced by the North American Industry Classification System (NAICS) since 1997. The numbers equivalent to the SIC codes are also presented in Appendix Table 2.

showed stability in the signs of their coefficients in the different formulations, the magnitudes and levels of significance behaved differently.

Host Country Factors

Host-country variables perform well, and only the GEO variable is not supported in our hypothesis tests. All the estimated coefficients were significant. The dummy variable GEO (modeled for EU countries other than the UK) was positively related to the acquisition mode, contrary to our expectations, showing that American companies prefer to enter into other countries' markets by acquisition and more likely use joint ventures for entry into the UK. Estimated GNPCAP, with a positive coefficient shows that firms prefer to enter by acquisition into countries with a higher level of economic development. FDIGDP also positive, supports our hypothesis that states that have a higher ratio of FDIGDP attract firms to enter by acquisition mode. Finally, the variable RIRATE supported our hypothesis, and it suggests that companies may decide to enter by joint venture when the host country incurs a higher in the interest rate, increasing the attractiveness for low equity investment because of the higher cost of investing in fixed capital.

Firm-Specific Factors

Estimated coefficients for all independent variables selected to compose the subset of firm-specific factors, excepting NSUB, representing international experience, ADMEXP and RELTN, supported the expected hypotheses.

Characteristics of the firm

Explanatory variables representing the characteristics of the firm had significant coefficients in all equations. The coefficients of the variable LOGEMP was negative and

significant, supporting the hypothesis that the larger the size of the US food companies, the more likely that their entry into EU countries would be through joint ventures.

Table 4.2: Country-Specific Variables and Expected Signs Relative to Acquisition

Variable Name	Description	Expected Signs
GEO	Geographic scope: Dummy = 0 if entry is in UK; Dummy = 1, otherwise	Dummy =1, GEO = -
GNP-CAP	The host country's GNP per capita as measure of income level.	+
FDI/GDP	Foreign business investment penetration in the local economy	+
RIRATE	Real Interest Rate	-

Table 4.3: Firm-Specific Variables and Expected Signs Relative to Acquisition

Variable Name	Description	Expected Sign
Characteristics:		
LOGEMP	Logarithm of the number of employees in a firm	-
STAG	Stage of the firm: Dummy = 0 if early/middle stage, Dummy =1, otherwise	Dummy =1, STAG=+
IEXP	Number of years since the firm setup its first foreign subsidiary	+
NSUB	Number of subsidiaries in EU countries	+
NSUBO	Number of subsidiaries in other countries that not in EU country	+
INTSALES	The percentage of sales to foreign markets over total sales for a firm	-
DIV	Firm's product diversification: Dummy=0 if firm possess less than 3-digit; Dummy=1, otherwise	Dummy=1, DIV= -
Competitiveness:		
RND	R&D expenditures as a percentage of total sales.	-
PERINT	Percentage of intangible assets over total assets	+
RELTN	Dummy variable – relatedness between the entrant and the new investment	-
ADVA	Advertising expenses over total assets	+

Table 4.4: Firm-Financial Variables and Expected Signs Relative to Acquisition

Variable Name	**Description**	Expected Sign
LEVER	Long-term debt over total assets	-
ADMEXP	Selling and general administrative expenses	-
TURNOV	Total sales over total assets	+
CAPSAL	Capital expenditure over total sales	-

The findings for the dummy STAG0 confirmed our hypothesis that firms which are engaged in the early or middle stages of making a processed food product show a greater likelihood towards joint venture, while those engaged in the later stages demonstrate a greater likelihood of entry by acquisition. Such a response to these variables has not been tested in any other studies, to our knowledge, and may be especially pertinent to food industries. However, Stopford and Wells (1972) show that MNCs based in extractive sectors, such as in our study, in the early stage might seek partners in the foreign country to process their output, since the parents lack the needed managerial know-how for competing in the new market.

Four variables were tested to capture the international experience of the firm and its extension of distribution channels as a determinant of mode of entry. LOGIEXP is highly correlated to all the other variables representing international experience and was not used in the same specifications as the other variables. Similar effects are noted for NSUB and NSUBO, but not for INTSALES, which did not pose problems with these previous variables. Together, they present an interesting result. IEXP, as expected, supported our hypothesis, presenting a positive and significant sign and showing that MNCs with a long history since making their first entry into the EU prefer to make their additional entries through acquisitions. Accordingly, the MNCs that have a greater number of subsidiaries in other countries that are not in the EU (NSUBO) also tend to have the same preference, due to the necessity to be well established in the EU market.

On the other hand, MNCs which already possess a large number of subsidiaries (NSUB) in the EU and a high level of international sales (INTSALES) are more likely to prefer joint ventures as the mode of entry.

Although there is no comparable study that has used the INTSALES variable to capture international experience of the company, we may speculate that American food companies with large extensions into international distribution channels and having a larger number of subsidiaries in the EU do not need to acquire more companies in those countries in order to increase sales through distribution expertise that they already have gotten from their subsidiaries. Thus, from these international experience activities, we can suggest that the IEXP variable, broadly used by researchers as a determinant of mode of entry, may not be as appropriate an indicator as expected. It is important to know, in addition to the time since the firm made its first entry, the number of subsidiaries and their expertise in distribution channels. However, it is also important to note that this finding seems to be a feature peculiar to food industry firms, which involve very specific distribution activities and reaching countries that form a very consolidated economic block, such as the EU block. The estimated coefficient for DIV0 was negative and significant, supporting our hypothesis that a high degree of product diversification might welcome joint ventures to develop certain products that the parent counts as peripheral and so economizing on managerial and other contributions to the venture.

Competitiveness of the Firm

The results associated with the competitiveness explanatory variables provide good support to our hypotheses. PERINT and ADVA demonstrated the expected signs, giving us evidence that firms which have greater intangible assets and advertising relative to assets will more likely choose their entry by acquisition mode. As we suggest earlier, it could be that

investors choose acquisitions because it will be possible for foreign entrants to acquire local brand names and to combine them with their firm-specific marketing skill. In the case of a GMO product's uncertainty of demand, acquiring leadership companies in that market will help a firm that needs greater knowledge of the consumer to keep visible their recognized brand and reputations front for this new market. Estimated RND results show a significant and negative sign, suggesting that R&D intensive firms are more likely to enter by joint venture, confirming our hypothesis that the mode joint venture either depends on different firms' technologies to be combined, or because one's technology needs the cooperation of a different sort of asset (such as marketing skills).

The estimated coefficient on the RELTN variable does not support our hypothesis about the likelihood of joint venture entry. The result, to the contrary, presented here is indicative of a counter argument that the entrant would benefit from relatedness and make its entry by acquisition because of its ability to readily draw upon the resources of the new subsidiary (Sharma, 1998).

Financial Variables

Most of the firm financial variables performed as we expected. LEVER and TURNOV presented multicolinearity and were not used in the same equation. LEVER performed very well, showing that firms with high financial leverage may have already used their internal funds and have to apply to corporate development funding activity by going to external equity markets. Following research from capital markets, such as Chatergee (1990) and Kasuga (2003), because the cost of external funds is higher than that of internal funds, the level of investment is affected and a joint venture is established when the parent firm's net worth is relatively small. Regarding TURNOV, firms which present higher turnover are more likely to enter into foreign markets by

acquisition, since its estimated coefficient implies that current management has been using assets in an efficient way and there are no financial problems to invest in new equity. The CAPSAL coefficient was negative, as expected, and highly significant in equation 4 at the 0.05 level. Thus, we may say that firms with lower ratios for capital expenditures over sales are very successful in cost efficiency and in asset utilization, and they will more likely choose the joint venture mode of entry to keep this low-cost strategy. ADMEXP was significant but positive, and contrary to what we expected, its estimated coefficient did not support our hypothesis that a high level of ADMEXP encourages acquisition. That is, the idea that firms with high levels of SG&A may not want to acquire a new firm because they could increase the probability of acquiring unwanted resources was not supported. The rationale for the observed pattern could be found in two bases. First, the acquisitions made are not in the same business and the probability of acquiring unwanted resources is not greater, if it is the case that the two markets are not related. Secondly, the company may not be concerned with only the SG&A costs. They often overlook SG&A expenses or allow them to remain in a secondary or possibly tertiary position, because selling expenses are a necessity in terms of operating a business (Smartbiz, 2005).

Comparative Results for Equation 5

Table 4.6 shows outcomes of the ordinary and GEE estimation procedures. Comparing the results, we see that the coefficients are substantively different in magnitude but with the same sign. However, the associated statistics are displayed somewhat differently. We converted the *z* – statistics to chi-square statistics by squaring them, in order to make comparisons. The standard errors from the GEE model are substantially lower than the standard errors from the logistic regression, and consequently all the significance levels of the estimated coefficients have been

improved. Efficiency of estimates comes from accounting for no independency of observations, since the responses are highly correlated within subject (Ballinger, 2004).

Conclusions

The conceptual framework used in this chapter improved our assessment of US food processing companies' determinant factors of the observed chosen entry mode into European Union countries. The Generalizing Estimating Equations (GEE) technique was confirmed to be a superior approach to simple logistic regression for this data covering the determinant factors of the entry mode. Improved standard errors gave us more confidence in the estimated parameters. In addition, variables such as GEO, FDIGDP, GNPCAP and RIRATE from the host countries and LEVER that were not significant in the logistic model did show significance in the GEE models estimated.

In firm-specific factors, all hypothesized characteristics and competitiveness factors of the firms had significant estimated coefficients in all specifications. The larger the size of the US food companies, the more likely that entry into EU countries will be through joint ventures. Also, firms engaged in the early or middle stages of making a processed food product show a greater likelihood towards joint venture, while those engaged in the later stages demonstrate a greater likelihood toward acquisition. International experience shows that MNCs with a long history since making their first entry into the EU prefer to make their additional entries through acquisitions. In addition, the MNCs that have a great number of subsidiaries in other countries that are not in the EU also have similar preferences. However, MNCs which already possess a large number of subsidiaries in the EU and a high level of international sales likely prefer joint ventures as the favored mode of entry. This finding is the same for firms with a high degree of product diversification. Regarding the competitiveness of the firms, R&D intensive companies

appear to present a greater likelihood of entry by joint venture, but firms which have greater intangible assets and advertising ratios will more likely choose entry by acquisition mode. The RELTN variable confirms our hypothesis about the likelihood of joint venture, since they can then select the resources they want through this investment mode.

Firm financial performance results, show that firms which present higher turnover, are more likely to enter into EU markets by acquisition. This finding confirms that, for firms where the assets are used in an efficient way, there do not appear to be financial difficulties to invest in new equity. LEVER, the proxy used for slack financial resources, was significant in this model, contrary to results of the ordinary logistic regression. And CAPSAL findings show that firms with lower ratios for capital expenditures over sales are more likely successful in cost efficiency and in asset utilization and will choose the joint venture mode of entry to keep this low-cost strategy. The hypothesis held for the ADMEXP variable is not supported; that is, a high level of ADMEXP encourages acquisition.

The findings in this analysis make several contributions to the literature on food industry entry mode and have valuable implications for both research and practice. We attribute that, mainly, to the disaggregate nature of the data and the treatment employed, which gave us the detail and richness that are presumably associated with choice of foreign market entry mode.

Table 4.5: Results of GEE Analysis of the US Food Firms' Mode of Entry into EU, 1990-2003

Variables	**Mode of Entry**				
	Equation 1	**Equation 2**	**Equation 3**	**Equation 4**	**Equation 5**
Intercept	11.100 **	-2.674	11.039 ***	-7.909 **	13.834 **
GEO0	-0.896 *	-1.019 *			
GNPCAP				0.031 *	
FDIGDP		0.280 **			
RIRATE			-0.208 *		-0.252 **
LOGEMP	-1.633	-3.935 *			
STAG0			-3.856 ***	-3.394 ***	-7.592 ***
IEXP		11.697 **			
NSUB	-0.062 *	-0.038			
NSUBO				0.203 **	
INTSALES	-0.076 **		-0.117 ***	0.023 **	-0.173 **
DIV0				1.994 **	
RND					-5.436 ***
PERINT	0.110 ***	0.087 **			0.131 ***
RELTN		0.026 **			
ADVA			0.959 **		
ADMEXP				0.087 **	
LEVER	-10.053 ***	-13.623 ***	-11.929 ***		-14.600 ***
TURNOV					3.971 ***
CAPSAL				-22.987 ***	

n = 52; * p < 0.05; ** p < 0.01; *** p< 0.001

Table 4.6: Comparative Analysis of the Equation 5 by using Logistic Regression and GEE

Parameter	Logistic Regression Model				GEE Regression Model			
	Estimate	Standard Error	Chi-Square	Pr > ChSquare	Estimate	Standard Error	Chi-Square (Z2)	Pr > Z
Intercept	12.354	8.387	2.17	0.1408	13.838	4.274	10.497	0.0012
STAG	-13.764	8.217	2.81	0.0939	-7.592	1.455	26.832	<.0001
RIRATE	-0.686	0.494	1.93	0.1650	-0.252	0.089	8.008	0.0047
INTSALES	-0.255	0.159	2.55	0.1104	-0.219	0.060	13.032	0.0003
PERINT	0.259	0.144	3.24	0.0717	0.131	0.020	40.96	<.0001
RND	-9.647	6.531	2.18	0.1397	-5.436	1.116	23.716	<.0001
LEVER	-9.951	13.615	0.53	0.4648	-14.600	4.023	13.176	0.0003
TURNOV	11.375	7.865	2.09	0.1481	3.971	0.826	31.248	<.0001

CHAPTER 5

ENTRY MODE EFFECTS ON PERFORMANCE

Introduction

The model Chapter 3 focused on delineating *ex ante* factors that influence the firm's decision choice. In this model, we evaluate factors that, depending of the mode of entry, affect the post-entry performance of the food processing companies.

The basic model in industrial economics follows from the structure-conduct-performance (SCP) paradigm. According to this paradigm, firm performance depends on its conduct, which in turn, depends on industry structure (Bain, 1959). Although many empirical studies have revealed the existence of important relationships between industry structure and profitability, the role of firm strategy has been largely ignored in the traditional industrial organization empirical literature (Spanos, Zaralis and Lioukas, 2004).

In this model, we will considerate only firm specific factors, although the importance of industry factors is known, for some basic reasons. First, the firm may have a chance to observe and identify what concepts and capabilities make one strategy more attractive than another. Secondly, many studies have found that although both set of factors significantly contribute to firm profitability, firm-specific factors explain more than industry factors.

Shaver (1998) asserts that firms choose the strategy that is optimal, given their attributes and those of their industry. Then, depending on firms' attributes and industry conditions, plants will have performance advantages in one mode over another. However, Shaver didn't find any industry variable with consistent significant effects. The same conclusion has been found for

other authors (such as Spanos, Zaralis and Lioukas, 2004), who found that firms-specific variables explain more than twice as much profit variability as industry factors.

The arguments applied here are based in studies that show the risks of entry into a new market, as they involve fixed and variables costs of administrative coordination. Few studies have attempted to consider such theoretical ideas.

Yip (1982) utilizes the concepts of economic theory of barriers to entry integrated with the corporate strategy concept of relatedness to explain the choice modes between acquisition and direct entry into new markets. He found evidence to suggest that the relatedness which reduces barriers has an asymmetric impact on the cost of entry under the two modes of entry.

Chatterjee (1990) extended Yip's efforts in applying strategic management to economic theory by introducing the concept of utilization costs, the cost of using excess resources and capital market imperfections to explain how companies choose to enter new markets. He concluded that firms tend to diversify into industries that use resources already used in their present industries, although they may need to obtain other resources that complement their existing resources before an entry is feasible, such as brand recognition that is lacking upon entry. He emphasizes that the choice of mode is influenced by the expected net cost of entry, after taking into account the reduction in total cost as a result of firm leveraging its existing resources into the new business and also by the expected post-entry costs and performance.

Following such reasoning, Sharma (1998) employed concepts of fixed and sunk costs, developed in the contestability literature, to test how industry and firm-level factors are differentially associated with post-entry performance of two modes: acquisition and *de novo* (greenfield). He explains that fixed costs are the operating expenses that are independent of the scale of production and are necessary recurring costs incurred to the same degree by both

incumbents and entrants. Sunk costs, by contrast, are those necessary expenditures that the entrant must incur to begin operations, and which are not fully recoverable in the short or intermediate term and impose incremental costs on the entrant that are not borne by incumbents.

Buckley and Casson (1998) developed a model extending the insights of internalization theory and concepts from the economics of industrial organization. They analyzed the foreign market entry decision encompassing the choice among various alternatives of market entry, such as exporting, licensing, joint venture and wholly owned foreign investment. Their model utilizes the idea of three additional costs of market entry: (a) marketing costs that the firm must incur to acquire market knowledge; (b) adaptation costs in order to adapt the product to the preferences in the new market; and (c) costs of building trust in newly acquired production or distribution facilities in the foreign market.

Studies of the kinds of mergers that are most likely to yield efficiency gains have developed in banks. Rhoades (1998) selected nine case studies to analyze the efficiency effects of bank mergers. He concluded that a strong commitment to cutting costs and a relatively efficient acquirer may increase the likelihood that a merger will enhance efficiency, but they are clearly not a guarantee.

Much of the economic literature has debated about the private gains, if any, following mergers and acquisitions. They agree that private gains could be due to a better exploitation of scale or scope economics (Williamson, 1968; Hennart and Park, 1993) or to an improved management of acquired firms through the correction of managerial failures or the transfer of superior managerial skills from the acquirers. For many reasons, especially the access to available data and unsuited methodology, studies have been able to assess the existence of these

gains but failed to provide evidence on the nature of private gains following mergers and acquisitions.

This study is based on the idea that the many alternatives of market entry chosen by firms differ in their fixed and organizational start-up costs, and a firm investing abroad combines some firm-specific advantages developed at home with other assets available in the foreign country to exploit abroad at low marginal cost. Thus, the following framework attempts to evaluate factors related to cost-efficiency and the entry mode affecting the performance of the firm.

A Conceptual Framework to Cost-Efficiency Factors and Mode of Entry

In the economic and management literature, the link between mode of entry, firm costs and profitability has not been empirically explored. Most discussion pertains to the choice mode depending upon factors which affect performance.

A firm's organizational strategic factors such as diversification, firm size, R&D intensity, advertising and other factors have been considered with the relative importance in determining the firm's economic performance. Many studies have empirically demonstrated the effects of those variables on firm profitability. (Biggadike, 1976; Spanos, Zaralis and Lioukas, 2004). However, none have assessed the performance relating such strategic factors with implied entry costs to the choice mode.

In the light of the significance of entry costs, it is important to identify (see Figure 5.1) what organizational strategic factors we posit to reduce the cost of entry, based on the firm's performance, if associated to the mode of entry also will have impact in the performance of the firm.

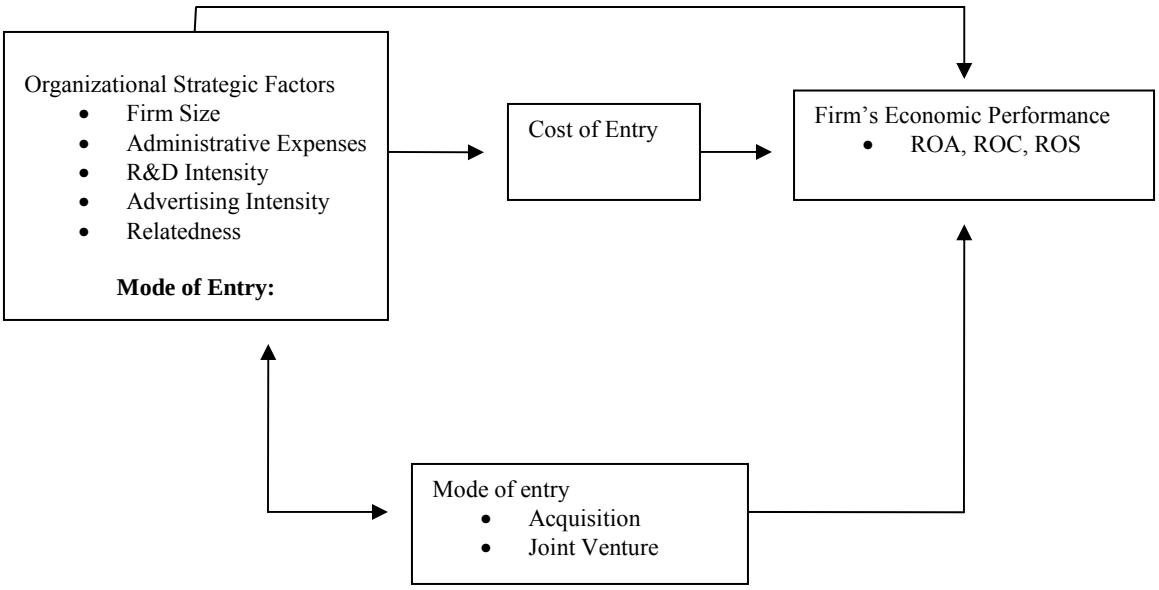


Figure 5.1: A Theoretical Model Framework Illustrating the Linkages among Organizational Strategic Factors, Cost of Entry, Mode of Entry and a Firm's Economic Performance.

Costs of Entry in a Foreign Market

Consider a host economy where there is at least one firm producing a single, non-traded good Q with the linear cost function $cq_1=c_1q_1$ where c represents the marginal (equal to average) costs of production. Considered that this firm operates as a fully integrated firm and has the total market knowledge acquired through experience. That is, they have the expertise, conferred by marketing activity. This activity involves investigating customer needs and maintaining the reputation of the product by giving customers the service they require. In the food and fiber industry context, this firm's production perfectly attends the European demand that recognizes its products as safe for human consumption. However, the local firms have higher costs, compared with foreign firms in the same industry, because of inferior technology, since very little research and development activity is generated. Then, in this market, the marginal costs of the foreign firm are lower than the local firm, $c_2<c_1$.

It is assumed that the rival firm realizes that, in case of competition with a foreign firm, their best strategy is to exit the industry by selling to the entrant those resources it wishes to buy or accept different alternatives offered by the entrant. For example, the entrant may want to acquire a particular whole firm, make a joint venture where jointly it owns the firm or establishes contracts for production and/or distribution. The reasons the local rivals play a passive role are that they know the power of the foreign firm and recognize that the best way to ensure a share of the market profit is to surrender to the entrant firm.

Now, consider a firm based in a home country that is seeking to enter the foreign market. As above, it will decide to enter a market by choosing between two strategies, acquisitions or joint ventures.

Consider the first case where the foreign firm enters the market via the acquisition. At the time of entry, the foreign firm has no foreign marketing activity, and consequently lacks market knowledge which involves distribution activities that comprise warehousing, transport, retailing, etc. and also involves investigating customer needs, maintaining the reputation of the product by giving customers the service they require, etc. This knowledge can be acquired through experience (learning from mistake) at the time of entry, incurring a once-and-for-all cost of entry, m. It is assumed that these marketing costs m will be minimized in the case of acquisitions, since the firm could also acquire the local production and distribution expertise in the local firm. However, it is not equal to zero. The firm can acquire, for example, the brand recognition that is lacking for most entrants. However, it will be considered that a firm will make some transference of intangible resources to compete in the new market, such as marketing and innovating skills, brand and management know-how.

The foreign firm entering by acquisition also incurs adaptation costs *d.* The product and production process used in the foreign firms have to be adapted to the requirements of the local market. The entrant uses a different technology from the rival, and equipment must be modified accordingly.

Now, consider the second case where the foreign firm enters the market via joint ventures. It is assumed that joint ventures are owned 50:50 by the two firms. Then, the entrant firm will share with the rival, costs and profits of the joint business, each one paying and receiving half of the costs and profits. The joint venture does not involve new facilities, or a change in ownership; it is assumed to be a "buy in" by the entrant to local firms. The strategic motivation for the formation of the joint venture has an important bearing on the governance of the venture, the operating costs and ultimately its performance. It will be considered that the entrant will form a joint venture in order to access to local market knowledge and product-specific knowledge that incurs cost of marketing, *m* and adaptation costs *d*, respectively. The market knowledge enable the firm to have access to suppliers/buyers, distribution channels and local cultural knowledge. The product-specific knowledge involves, besides the local production expertise, access to technology and to local regulatory knowledge.

Based on the description above, where both modes of entry incur marketing and adaptation costs, it is reasonable to assume that the performance of the entrant firm will depend on its capabilities and/or attributes. Thus, it can not be assumed that acquisition is profitable compared to joint venture or vice-versa based only on marketing and adaptation costs of entry. It can be said that, based on firms' attributes, one strategy may lead to lower cost of entry than another and sequentially better performance.

Taken together, the following proposition may be true in the agribusiness context:

Proposition 1: Because both acquisition and joint venture modes of entry incur marketing costs and adaptation costs, it will be expected that, based on firm' attributes and also the chosen mode, firms will present lower or higher levels of profitability.

Chatterjee (1990) comments that a firm targeted for acquisition will generally has resources besides the complementary ones or the desirable ones that will become redundant, tied up financial resources, and add to the entrant's overall costs, since the firm probably will not be able to sell these unwanted resources and recover the appropriate value. He calls these resources of utilization costs[6] *u,* that is equal the costs of acquiring complementary resources less reduction in operating costs from transferable excess resources. The probability of acquiring unwanted resources thus lowers the incentive for acquisitive entry. The situation can be changed depending of the relatedness of the new market. The more closely related the two markets are, the fewer the needed complements to the firm's own physical and knowledge-based resources. Therefore, an acquisitive entry in a related market is, more likely to involve the purchase of unwanted assets. On the other hand, when the firm transfers its own resources it reduces the operating costs. Then, if an entrant can expect a large reduction in operating costs from transferable assets it will not prefer acquisition mode.

When the costs of utilization is higher, that is the indigestibility problems is severe, joint venture can be attractive because they allow the companies to link their resources selectively as needed. Unlike acquisitions, alliances do not require companies completely to extract desired assets from others or to shed unwanted assets after the investment has taken place.

[6] Reur (1999) calls these unwanted assets of indigestibility.

Proposition 2: When the costs of utilization are higher (that is the indigestibility problems are severe), joint venture may be chosen because it allows the companies to link their resources selectively as needed.

Caves (1998) makes reference to another kind of costs involving the completeness of the contract. While a rental or purchase contract simply transfers control of an asset, a joint venture links the partners through an incomplete contractual relation in which their shared equity commits them to negotiate how to handle whatever disturbances or opportunities subsequently arise. Relative to a complete contract, its incompleteness implies high ongoing costs of haggling and monitoring *h* subject to little contractual foundation beyond the parties' defined contributions of inputs and equity shares.

Preposition 3: When the cost of haggling and monitoring is higher, acquisition may be attractive because it allows the companies to manage their resources as needed.

Note that the costs *m, d, u* and *h* are sunk costs and therefore, independent of output produced by the firm and do not enter into the firm's first order condition for profit maximization. Gorg (2000) explains that these costs are distributed over the expected life duration of the firm by financing through borrowing at a given interest rate *r*. Thus, the costs for marketing, adaptation, utilization and the premium in any given period are *rm, rd, ru* and *rh,* respectively. Building on these basic statements, it will be possible to advance on specific hypotheses in the next section.

Firm-Specific Factors, Costs of Entry and Economic Performance

Williamson (1996), in his transaction-cost theory, suggests that each mode of entry structure has a different cost and competency structure. Thus, their associated hazard and

safeguard costs also vary, and firms are encouraged to make an analysis of their firm specific factors to select the mode of entry that economizes on these costs. Many studies refer to firm-specific factors, such as firm size and international experience, as likely to have important mode choice and performance consequences (Hennart, 1991).

As depicted in a conceptual framework presented earlier, a proper utilization of well-chosen firm strategic factors, such as firm size, the degree of relatedness, R&D and advertising intensity, will be analyzed in order to understand their relationships with cost of entry. How these factors may affect the firm's performance, and further, how, if this is the case these factors together with the entry mode also impact the performance of the firm will also be examined. Hypotheses will be developed for the entire firm-specific factors relating first to direct economic performance and secondly, to cost of entry followed to performance.

Firm size

Firm size is one of the most frequently acknowledged determinants of a firm's profits. Most studies have demonstrated that there exists a positive relationship between company size and profitability. In fact, large corporate size often results in market power that can be used to extract favorable terms on the firm's cost of raw materials and capital. Firm size also helps in achieving economies of scale due to the large quantities of output involved (Lee and Habte-Giorgis, 2004). Then, we can state that:

Hypothesis 1a: Everything else constant, the larger the size of the firm, the higher the economic performance of the firm.

However, a larger firm has the probability of acquiring unwanted resources in the case of making an acquisition. Then, the costs of utilization are higher and joint venture can be selected. This suggests that:

Hypothesis 1b: Everything else constant, the larger the size of the firm, the higher the cost of utilization if acquisition is the chosen mode of entry and the lower the economic performance of the firm.

As a firm grows, the management of problems and conflicts also arises. A larger firm faces higher costs and greater difficult monitoring its own managers and employees so as to ensure that they operate efficiently and profitability. There is nothing inefficient about incurring costs, as long as they are offset by benefits (Carlton and Perloff, 1999). Then, in the case of acquisition entry, the managerial challenges will increase, as will the marketing costs. Therefore, another hypothesis about firm size can be stated:

Hypothesis 1c: Everything else constant, the larger the size of the firm, the higher the marketing cost if acquisition is the chosen mode of entry and the lower the economic performance of the firm.

Relatedness

A central issue on corporate diversification has been what determines the direction of the firm diversification into related or unrelated lines of business (Teece, 1982), and more recently, what the concept of relatedness does includes (Piscitello, 2000). Much research has shown that firms do not diversify in a random way (Teece et al, 1994). Penrose (1995) believes that "there are many reasons why the firm should see its prospects of growth, its productive opportunities in terms of its productive resources and its knowledge, and should search for opportunities of using them more efficiently". However, "this process of identifying and integrating competencies almost inevitably requires investment in in-house learning and patient experimentation" (Piscitello, 2000 p. 299). This can be especially true for entry in foreign markets.

Entry is likely to be less costly, and ultimately more successful, when the high relatedness between the types of experiences available to the firm can help it quickly overcome the sunk cost disadvantage relative to the incumbents (Sharma, 1998). Thus,

Hypothesis 2a: Everything else constant, the higher the relatedness of the firm with the new subsidiary, the higher the economic performance of the firm.

However, when relatedness is very high, a firm choosing its entry by acquisition has the probability of acquiring, as discussed above, unwanted resources that possibly will not be easy to coordinate. Then, the costs of utilization are higher and joint venture again can be selected. Therefore:

Hypothesis 2b: Everything else constant, the higher the relatedness of the firm with the new subsidiary, the higher the cost of utilization if acquisition is the chosen mode of entry and the lower the economic performance of the firm.

Administrative expenses

Selling, general and administrative expenses (SG&A) include all of the costs of operating the business, other than the costs of readying the product for sale. SG&A consist of rent, insurance, electric, office supplies, telephone, salaries and benefits, interest, travel, entertainment, advertising, legal and accounting, licenses and permits, dues and subscriptions, maintenance and repairs, postage, insurance and credit card services.

Companies often overlook SG&A expenses or allow them to remain in a secondary or possibly tertiary position, because selling expenses are a necessity in terms of operating a business. However, high SG&A expenses can be a serious problem for almost any business. (Smartbiz, 2005).

Most agribusiness companies relate in their financial report results from SG&A associated to mergers and acquisitions. In general, an increase in the SG&A costs occurs due principally to recently-acquired plant or operations. This increase reflects the costs associated with developing a larger corporate staff to support acquisition efforts and expanded operations, including an expanded information system staff. Companies also relate their expectations to the total savings that will come from a rationalization of selling, general and administrative expenses, with the balance from, for example, leveraging the combined R&D platform, or as well rationalization of manufacturing, supply and distribution. Thus, we can state:

Hypothesis 3a: Everything else constant, the higher the SG&A of the firm with the new subsidiary, the higher the economic performance of the firm.

Although some authors believe that comparing SG&A between companies is a difficult task because of the inconsistencies in categories and the differences in accounting classifications (Smartbiz, 2005), in this study, this variable is used as a proxy for cost of utilization or unwanted assets. As already stated, the probability of acquiring unwanted resources lowers the incentive for acquisitive entry if is the case that the two markets are related. Then, a joint venture can be more attractive, because allows the companies to link their resources selectively as needed. Therefore, a hypothesis about administrative expenses can be stated:

Hypothesis 3b: Everything else constant, the greater the Administrative Expenses of the firm, the higher the utilization cost if acquisition is the chosen mode of entry and the lower the economic performance of the firm.

R&D intensity

Most traditional research in economics and business strategy suggests that firms that invest a large portion of their sales on R&D tend to experience more growth than those that do

not. In a comprehensive approach to the effect of R&D expenditure on the firm's value, employing a considerable firm size, Chauvin and Hirschey (1993) empirically demonstrated that R&D expenditure has positive and consistent influences on the market value of the firm. Several other studies have also found that company growth and market value of the firm increase along with R&D, irrespective of industry and size ((Lee and Habte-Giorgis, 2004). Thus,

Hypothesis 4a: Everything else constant, the greater the R&D intensity of the firm, the higher the economic performance of the firm.

Although studies have found that R&D activity contributes to the success of firms, empirical studies of firm-level R&D and cost of entry are relatively scarce. R&D intensive firms when going abroad based in the assumptions stated on the above section, will likely look to find a lower technology firm. Then, that firm will have to adapt their product, production process, equipment, etc., to the local firm, incurring adaptation costs. Although this is true to acquisition and joint venture entry mode, it's probably that for the later, those costs are linked only to the desired assets from the partner. The parties' other business remain separate from the venture. Thus,

Hypothesis 4b: Everything else constant, the greater the R&D intensity of the firm, the higher the cost of adaptation if acquisition is the chosen mode of entry and the lower the economic performance of the firm.

However, this firm-specific advantage may also render technological spillovers that tend to be of significant concern for the parent company. In case of JV, Barbosa and Louri (2002) observe that the cost of co-coordinating, monitoring and defining the proprietary rights may outweigh the potential gains of a partnership with local firms. Caves (1996) as we have introduced before, discusses the risks that an intensive R&D firm may incur when a joint venture

is chosen, since it can be affected by the potential risk of misappropriation or leakage of the technological developments. Hence,

Hypothesis 4c: Everything else constant, the greater the R&D intensity of the firm, the higher the cost of monitoring its joint business if joint venture is the choose mode of entry and the lower the economic performance of the firm.

Advertising intensity

In studies examining the relationship between various accounting measures of profit and advertising, the causality of any such relationship is sometime open to question. Firms may incur costs today, lowering current profits, which raise profits in the future (Carlton and Perloff, 1999). However, a consensus exists that because of the rapid rate of new product introductions in the food industry, advertising is required to inform potential customers of their availability and to establish strong brand images (Weston et al., 1996), which requires, especially in the EU market, safety of their products.

Hypothesis 5a: Everything else constant, the greater the advertising intensity of the firm, the lower the economic performance of the firm.

As in some studies, such as Hennart and Park (1993) that posits that firm with higher advertising intensity favors acquisition over greenfield, that is low equity instead higher equity, we expect that just a firm with lower advertising will likely reduce the cost of marketing in case of acquisition, because it will be possible for foreign entrants to acquire local brand names and to combine them with their firm-specific marketing skill. But a higher advertising US food company may use its capability in a joint venture entry, where they may reduce their cost of marketing cost in their part in the contract. Although Kogut and Singh (1998) relates that there

is more agreement that advertising and buyer-goodwill assets point away from joint ventures, we in this study suggest,

> *Hypothesis 5b: Everything else constant, the greater the advertising intensity of the firm, the lower the marketing cost if joint venture is the chosen mode of entry and the higher the economic performance of the firm.*

Methodology

This section describes the data, method and variables used in this study to test the hypothesis introduced in the conceptual framework.

Hierarchical Multiple Regression

Hierarchical Multiple Regression (HMR) analysis is a statistical method very similar to stepwise regression, but the researcher, not the computer, determines the order of entry of the variables. F tests are used to compute the significance of each added variable (or set of variables) to the explanation, reflected in R-square. This hierarchical procedure is an alternative to comparing betas for purposes of assessing the importance of the independents. In more complex forms of hierarchical regression, the model may involve a series of intermediate variables, which are dependents with respect to some other independents, but are themselves independents with respect to the ultimate dependent. Hierarchical multiple regression may then involve a series of regressions for each intermediate as well as for the ultimate, dependent.

This study will use a Moderated Multiple Regression (MMR), which involves hierarchical regression. We first will test the relationship of the predictors of interest (firm-specific variables) on the dependent variable (performance variables), and secondly test the relationship of a term that carries information about both predictors (the interaction term). The categorical predictor (in this case, Mode of Entry) is typically dummy coded 0 for JV and 1 for

Acquisition. The interaction term can then be computed for each subject by multiplying the two predictors such that the resulting regression equation is in the form:

$$Y = \alpha + \beta_1 X + \beta_2 Z + \beta_3 X \bullet Z ,$$

Where *Y* is the predicted value for *Y* (performance), α is the least squares intercept, β_1 is the least squares estimate of the population regression coefficient for *X* (predictor), β_2 is the least squares estimate of the population regression coefficient for *Z* (mode), and β_3 is the least squares estimate of the population regression about the interaction between *X* and *Z* (Cohen & Cohen, 1983). Rejecting the null hypothesis that $\beta_3 = 0$, indicates the presence of an interaction or moderating effect.

Description and Measurement of Variables

A detailed description and measurement of the set of variables designed to test the propositions and hypotheses introduced in the conceptual model is provided.

Dependent Variable:

Measurement of performance has long presented significant challenges for researchers. In the majority of previous studies, two types of financial performance measures are used: accounting-based performances are more traditional and directly derived from accounting profits, whereas market-based performances are becoming very popular and important to business enterprises, since they are indicators of an enterprise's value. Acheampong and Wetzstein (2001) explain that value-added means value creation to a business. Then when an enterprise is operated efficiently, value is added to the business, so efficiency measures can be used to adequately describe performance.

Several studies have investigated the gains to using value-added measures rather than traditional ones. Lewis and Minchev (2000) suggest that economic value added may be a more

appropriate measure once the underlying motive for firms with overseas expansion is the increase in the amount of profits, not profitability per se. Habib and Victor (1991) defend the use of accounting measures on the premise that managers and external analysts use these as a measure of efficiency of top managers. Other studies, such as Peterson and Peterson (1996), that identified return on capital (ROC) as a value-added measure. They suggest that although traditional measures have no theoretical appeal, they should not be eliminated as a means of evaluating performance because comparing them with the market's assessment of company performance (stock returns) they are not empirically less related to stock returns than return on capital. Acheampong and Wetzstein (2001), who employed a stochastic frontier analysis to compare value-added measure from traditional measures of performance in the food industry, conclude that value-added measures are not significantly different from traditional ones, and thus little information is gained by replacing them.

In order to gain more accurate results and to minimize possible weaknesses associated with the use of a single measure of performance, two profitability or, more precisely, rate-of-return measures were analyzed in addition to a one value-added measure (ROC). The first is ROA, the ratio of net income (after taxes) to average assets that indicates the ability of the firm to generate profits from the assets at its disposal. Thus, it allows comparisons over different size firms and different types of business investments. The second is ROS, the ratio of net income to total sales. It is an important measure because it describes how well a dollar of sales is "squeezed" by the firm into profit.

It is important to stress that all these measures are based on a ratio of expenses to assets or operating revenue rather than absolute expenses in order not to separate pure expense (cost) reductions with efficiency gains. That is, "an absolute expense reduction would not indicate an

efficiency gain if assets were reduced proportionately; it would simply reflect a shrinking firm" (Rhoades, 1998 p. 279). Also, because most of the studies on mergers indicate that firms projected that the cost savings would be fully achieved within three years (Rhoades, 1998), we used the performance dependent variable at the time three years after the entry has occurred.

Again, the performance variables are:

- ROA – Return on assets = Ratio of net income to total assets;
- ROS – Return on Sales = Ratio of net income to total sales;
- ROC – Return on the Invested Capital = Ratio of net income to invested capital.

Independent Variables

The firm-specific attributes of the firms were operationalized using four variables:

- SIZE - Size of the firm was measured as the logarithm of the number of employees in a firm;
- RELTN – Degree of relatedness between the parent firm and its new business was measured using a modified index developed by Sharma (1998), who based his computation in a version of the diversification index (Caves, Porter, and Spence, 1980): RELTN = $\sum(P_k \times d_{ij})$, where P_k is the percentage of firm *k*'s sales, and d_{ij} is the weight whose value depends upon the distance between the product *i* and the other products *j* in which the parent has operations. Because our study is working only with food industry, we do not consider the subscript *l* from Sharma's index. Therefore, the weight's modification will be as follows:

d_{ij} = 2 if *i* and *j* are within the same 3-digit SIC,

= 1 if *i* and *j* are within the same 2-digit SIC, and

= 0 if *i* and *j* are in different 2-digit SIC.

- RND - Research and Development expenditures were measured as the R&D expenditures as a percentage of total sales;
- ADVS – Advertising expenses were measured as the advertising expenditures as a percentage of total sales;
- MODE of entry is captured by a dummy variable which takes a value of one if the firm has decided to enter a foreign market via acquisition and zero if has decided to form a joint venture.

Data sources

Information from US agribusiness firms that use GMO products in their processing food products and have invested in the EU market will be used to examine which is the best strategy for them to enter into foreign markets. The companies to be studied in the period of 1990 to 2003 belong to the major group 20 of the Standard Industrial Classification (SIC) Code; specifically, those four digits regarding corn and soybeans products. This code has been replaced by the North American Industry Classification System (NAICS) since 1997. The numbers equivalents to the SIC code are also presented in Appendix, Table 2. Because this study will use data from 1996, the year when the GMO crops were introduced in the US, to 2000, it may be necessary to use both codes.

The diverse sources to be consulted for collecting data are: Securities Database, Merger and Acquisitions, American Global Access, Hoovers, Thomson Financial Services Data, Agricultural Statistics and individual companies' annual reports. Of 198 companies selected by SIC code, 20 have invested in foreign subsidiaries in the EU and only 9 companies have completed available information regarding their operations. Those companies are presented in Appendix Table 3.

Descriptive Statistics

All forms of statistical analysis assume sound measurement, relatively free of coding errors. It is good practice to run descriptive statistics on one's data so that one is confident that data are generally as expected in terms of means and standard deviations, and there are no outliers' entries beyond the expected range.

Table 5.1 provides descriptive statistics for both the dependent and independent variables employed in this study. Values for the mean, minimum, maximum and standard deviation of the variables are provided.

Table 5.1: Descriptive Statistics for Independent Variables.

Variable	N	Mean	Std Dev	Sum	Minimum	Maximum
Size	52	16,49	0.3697	85,537	10,800	25,705
Relatedness	52	95,99	31,780	4,992	25,740	242,430
AdmExp	52	0.3297	0.2449	17,145	0.0237	0.9486
R&D	52	0.6850	0.3231	35,622	0.0868	14,930
Advertising	52	0.0508	0.0541	26,448	0.0002	0.1906

Discussion of the Results

In this section results concerning the post-entry performance of the agribusiness companies are presented. The following findings address the three propositions discussed in the conceptual model (i.e., propositions related to *entry in the market by the foreign firm*), which include marketing and adaptation cost, cost of utilization and cost of haggling and monitoring. The hypotheses tests are discussed simultaneously with the findings obtained with the regression models.

A hierarchical multiple regression analysis was employed to examine the effect of mode of entry on the linkages between firms' strategic factors and performance. Before estimating the hierarchical regression model, a correlation test was conducted among the independent variables to check for the possibility of problems associated with multicollinearity. As indicated in the Table 5.2, the Pearson correlation test shows that, the variables are not strongly correlated. Also, the Variance Inflator Factors (VIF) for all independent variables was computed, and their low values indicated that the hierarchical regression can be interpreted with reasonable confidence. Therefore, the effects should not be unduly influenced by multicollinarity. Consequently, all the hypothesized variables are included in the hierarchical model.

Table 5.2: Correlations among Defined Variables[a].

Variables	Size	Relatedness	AdmExp	R&D	Advertising
Size	1.000	-0.2003	-0.3237*	0.0145	-0.3317*
Relatedness	-0.2003	1.000	-0.0366	-0.0893	0.1596
AdmExp	-0.3237	-0.0366	1.000	0.510***	-0.2135
R&D	0.0145	-0.0893	0.510***	1.000	-0.626***
Advertising	-0.3317*	0.1596	-0.2135	-0.626***	1.000
VIF[b]	1.425	1.059	1.597	2.192	1.994

[a] n = 52; VIF indicates variance inflation factor (i.e., a measure of multicollinearity among the independent variables)

* $p < 0.5$; ** $p < 0.01$; *** $p < 0.001$

Result of the standardized regression analyses are presented in Table 5.3 and summarized in Table 5.4. Initially, we run a regression model of the firm's factors on the three indices of firm performance to examine which firm's factors have significance in determining the economic

performance of the firm (Step 1). Subsequently, we add to the model the MODE variable to examine simultaneously the effect of mode of entry and all the firm's factors on the performance of the firm (Step2). Finally, we include all the interaction product terms of entry mode with the firm variables (Step3) to determine if there is a change on the significance of the parameters of the regression, implying that the mode of entry is interacting with a firm's factors to lead to lower or better performance. That is, depending on firm attributes, acquisition will have performance advantages over joint venture or vice-versa.

While the use of panel data has the advantage of providing additional insights into company characteristics intertemporally, the error term often exhibits serial correlation and heteroscedasticity problems. However, appropriate data transformations can make the error term serial non-autoregressive and homoscedastic (Kmenta, 1986). Because in those equations, all the three dependent variables are at the time $(t + 3)$ we can expect that the model, as it stands, must be checked for the presence of autocorrelation. Based on the results from a Durbin-Watson test, we could not reject the hypothesis indicating the presence of first-order autocorrelation in the residuals. So, the ordinary least squares (OLS) estimator is unbiased but not efficient. The sampling variances are underestimated, causing inferences from *t* and *F* tests to be invalid. The way used to compensate for the autocorrelated residuals was the Yule-Walker method (often called Prais-Winsten). The Yule-Walker method estimates the autoregressive form of the error term and then estimates the coefficients via generalized least squares (GLS) (Statistics and Operations Research).

We test the presence of heterocedasticity in the model, looking for patterns in a plot of the residuals from the regression. Just one variable (ADVS) presented a pattern of plots not

satisfactory. However, a transformation (ADVS square root) resolved the heteroscedasticy disturbances without generating a distortion in the model.

All the regression models with respect to various performance measures were highly significant ($p < 0.001$). In Step 1, the set of firm's factors explained, on average, 65% of the variance in the performance variable ROA, 50% in ROC and 52% in ROS. Our findings indicate that the size of the firm (Size) variable is positively related to all the three performance measures, although significant at the 0.001 level just for ROA and at the 0.05 level for ROS. This finding confirms our first *hypothesis 1a* that the larger the size of the firm, the higher its economic performance.

The relatedness (RELTN) variable performed as expected in two equations for Step 1. It is positively related to performance at the 0.05 level of significance in ROA and ROS equations. Although the coefficient of the parameter estimated appears to be very small (0.029 and 0.007), we can say that for an agribusiness company, the relatedness between the types of experiences available to the firm would benefit the entrant because of their ability to readily draw upon resources of the local operating business.

The estimated coefficient for ADMEXP was positive in all performance equations and significant at 0.05 level in ROA and at 0.01 level in ROC equations, confirming our hypothesis that the higher the SG&A of the firm with the new subsidiary, the higher the economic performance of the firm.

R&D expenditures (RND) coefficient significant just in the ROC equation, where it presents a negative sign, does not support the *hypothesis 3a*. Then, we can not say that agribusiness firms with larger levels of R&D expenditures are expected to have performance

advantages, at least in ROC and ROS equations. The coefficient in the ROA equation was positive, but not significant.

The estimated coefficient for ADVS was negatively related to performance in all equations, but significant at the 0.001 level just in ROC equation. This result supports our hypothesis 4a, where it was expected that high expenditures in advertising would reduce the performance of the firm. This is a very special feature of food industry firms, which depend on products involved in biotech issues and really need to intensify their costs to inform potential customers of the safety of their products.

In Step 2, we added to the basic model (Step1) the categorical predictor, Mode of entry (MODE) to explore the simultaneous effect of Mode on the firm's performance after controlling for the other strategic factors. All regression models with respect to various performance measures were significant at the 0.001 level, and the set of firm-specific factors and the mode of entry explained, on the average, 65.8% of the variance in the performance of the firm, for ROA, 57.3% for ROC and 60% for ROS.

The coefficient for the new variable (MODE) included in the model was positive and significant at the 0.05 level in ROA and at the 0.01 level in ROC, indicating the existence of the influence of Mode of entry on the firm performance when other factors are held constant. That is the acquisition mode of entry may lead the firm a better performance than the joint venture in ROA and ROC equations. However, in the ROS equation, the estimated coefficient was negative, although very small, but significant at the 0.01 level. This different finding shows that, joint venture performance better in the case of return on sales.

The estimated coefficient for SIZE and ADMEXP behaved in all three equations as with the same sign as in the Step 1. The RELTN coefficient, although significant at the 0.05 level just

in the ROC equation, now presented a negative sign. The rest of the variables RND and ADVS were not significant, although with the same coefficient sign from Step 1, with the exception of ADVS which was not significant in the ROA equation.

The adjustment of the extended model significantly improved in Step 3 for all equations, when we added the interactions of mode of entry with all firm specific factors to explain the moderating effect of this variable on the firm factor – performance relationship. The findings of this last step indicate that the inclusion of the interaction terms improves the amount of variance explained in firm ROA performance to 80%, in the ROC to 64,7% and in ROS for 86%.

With the overall improvement of the model, we can now start to get support for our first *proposition,* which predicts that we can not compare the profitability of the company based only on the firm attributes; the mode of entry taken together with those factors, will give the entrant firms the necessary information for this decision. The variables already discussed from the Step 2 were significant and presented the same signs for the parameter estimates for the SIZE and ADMEXP. The relatedness variable presented a negative sign in all equations, although a very small coefficient. RND coefficient in this step is highly significant at the 0.001 level but with a positive sign in ROA and negative in ROS. The finding shows that an increase in one unit of R&D expenditures in the US food companies, there is an increase by 18% in the level of return on assets on those companies, but a decrease of 0.7 % in the level of return on sales. ADVS coefficient, also significant at the 0.001 level, behaved different in these two equations. It was positively related to ROA, but negatively related to ROS.

Regarding the interaction terms, the ModeSize significant at the 0.05 level just on ROC equation presented a positive sign not supporting our hypothesis. Actually, it suggests that an

increase in the size of the firm when the chosen mode of entry was acquisition will lead the firm to a higher performance relative to return on capital, holding the other variables constant.

Proposition 2 that predicts that joint venture may be chosen when the cost of utilization is higher is supported by the result for the second interaction term, ModeReltn. Relatedness in this model means that the firm depending of the mode of entry will get more resources already existing and this incurs more costs. Then, consistent with *hypothesis 2a,* the estimated parameter for ModeReltn is negative and highly significant in the ROA equation and indicates that an increase, say, the more relatedness of the parent with the potential subsidiary, if the acquisition was taken, the more their profitability will be reduced, holding everything else constant.

The interaction term ModeRND displays a significant and negative sign for its parameter in the ROA equation and a positive in the ROS equation. Then, the former with a higher coefficient than the later, confirms the *hypothesis 4b,* but evidently, the result in the ROS equation supports *hypothesis 4c*. The findings in ROA equations show that a high intensity R&D firm choosing the joint venture as a mode of entry will have a better performance related to return on assets. The explanation for that is attributed to the cost of adaptation that the foreign entrant has when it is incorporated to an ongoing business which is assumed in this study to be lower in technology development. On the other hand, the results on the ROS equation, although presented a very small coefficient, show that an acquisition may be chosen in the case of the performance is related to a return on sale. In this case, the cost of monitoring a joint business may has effect in determining the ownership structure for the American agribusiness company, supporting the *proposition 3* which says that firms may prefer acquisition when the cost of haggling and monitoring is higher in joint venture mode

The variable ModeADVS, presented the same contradictory result as in RND. In ROA equation, the interaction term favors joint venture to the detriment of acquisition mode of entry, and in the ROA equation the opposite. In the first measure of performance it displays a negative and highly significant sign, strongly evidencing that an increase in advertising expenditures in agribusiness companies will reduce its cost of marketing just if the joint venture mode is chosen and then it will lead to a better performance. Thus, the last *hypothesis* is strongly supported in ROA equation. But evidently not supported in the ROS equation where the sign is positive.

Conclusions

In this chapter, we developed a framework to identify what organizational strategic factors we posit to reduce the cost of entry, based on the firm's performance, if associated to the mode of entry also will have impact in the performance of the firm. For that, a hierarchical multiple regression analysis was employed to examine the effect of mode of entry on the linkages between firms' strategic factors and performance.

In Step 1, our findings indicated that the larger the size of the firm, the higher its economic performance. The same conclusion we got for ADMEXP, which confirmed that, the higher the SG&A of the firm with the new subsidiary, the higher the economic performance of the firm. For the relatedness (RELTN) variable, the relatedness between the types of experiences available to the firm gave benefits to the entrant because of their ability to readily draw upon resources of the local operating business. Firms with larger levels of R&D expenditures did not have performance advantages, at least in ROC and ROS equations. Also, firms with high expenditures in advertising would reduce the performance of the firm. This is a very special

feature of food industry firms, which depend on products involved in biotech issues and really need to intensify their costs to inform potential customers of the safety of their products.

In the Step 2, the added variable (MODE) indicated the existence of the influence of mode of entry on the firm performance. The acquisition's mode of entry may lead the firm a better performance than the joint venture's in ROA and ROC equations. However, in the ROS equation, joint venture performance better.

In Step 3, we got support for our first *proposition,* which predicts that we can not compare the profitability of the company based only on the firm attributes; the mode of entry taken together with those factors, will give the entrant firms the necessary information for this decision. Regarding the interaction terms results, the ModeSize did not support our hypothesis. It suggested that an increase in the size of the firm when the chosen mode of entry was acquisition will lead the firm to a higher performance relative to return on capital and sales, holding the other variables constant. ModeReltn supported our *Proposition 2* that predicts that joint venture may be chosen when the cost of utilization is higher. Also, show in the ROA equation that, the more relatedness of the parent with the potential subsidiary, if the acquisition was taken, the more their profitability will be reduced. The term ModeRND behaved differently in ROA and ROS equations. It show that a high intensity R&D firm choosing the joint venture as a mode of entry will have a better performance related to return on assets. The explanation for that is attributed to the cost of adaptation that the foreign entrant has when it is incorporated to an ongoing business which is assumed in this study to be lower in technology development. On the other hand, the results on the ROS equation show that an acquisition may be chosen in the case of the performance been related to a return on sale. In this case, the *proposition 3* which says that firms may prefer acquisition when the cost of haggling and monitoring is higher in joint venture

mode is supported. Firms with higher advertising activities and that made their entries by joint venture had a better performance in ROA, but not evidently in the ROS equation where the sign was positive.

The use of interaction terms in this model change considerably the direction of interpretation of many firm-specific factors influencing performance. The results associated with the effects of mode of entry, their cost and performance provide a reasonable basis to help managers, who, as demonstrated in one's words here, are always in constant uncertainty when they have to take decisions about their foreign investment strategy.

> "In February of this year we purchased a majority interest in an EU country. We have a little experience in managing businesses in Europe, and no experience with managing a European dairy operation. Moreover, conducting operations in Europe involves risks and uncertainties not present in the U.S. Our success depends to a large extent on the skills, experience and performance of our key management". (Campbell Soup Management, 1997).

Table 5.3: Hierarchical Analysis Results: Simultaneous Effect of Firm-Specific Factors and Mode of Entry on the Firm's Economic Performance [a].

VAR	ROA			ROC			ROS		
	Step 1	**Step 2**	**Step 3**	**Step 1**	**Step 2**	**Step 3**	**Step 1**	**Step 2**	**Step 3**
INTERCPT	-7.190 *	-11.222 **	-25.278 ***	76.865 **	35.403	75.402	0.073	0.171	1.308 **
SIZE	6.044 ***	7.629 ***	8.163 ***	0.249	10.479	-19.607	0.072 *	0.054	0.163
RELTN	0.029 *	-0.011	-0.010	-0.097	-0.171 *	-0.348 **	-0.007 *	-0.004	-0.004 **
ADMEXP	6.117 *	7.017 *	7.970 ***	61.704 **	56.498 **	74.946 ***	0.071	0.082	0.049
RND	2.876	2.715	18.058 ***	-39.720 **	-36.612 **	-23.673	-0.048	-0.049	-0.531 ***
ADVS	-0.593	19.217	94.592 ***	-137.001 ***	-63.886 *	-28.107	-0.179	-0.375 *	-2.568 ***
MODE		2.627 *	21.914 ***		25.146 **	-38.793		-0.089 **	-1.358 **
MODSIZE						56.259 *			0.217 *
MODREL			-0.349 ***			-			0.004 **
MODEXP			-5.852			-			-
MODRND			-16.646 ***			-5.394			0.517 ***
MODADV			-38.132 ***			-138.673 **			0.760 ***
R^2	0.6513	0.6582	0.8016	0.5017	0.5737	0.6854	0.5265	0.6069	0.8885
AIC	257.94	258.95	234.58	466.80	460.49	450.81	-113.50	-120.79	-175.97

[a] n = 52; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 5.4: Summary of the Results of the Hierarchical Regression

Variables	Performances		
Firm Strategic Factors	**ROA**	**ROC**	**ROS**
• Firm Size	+	+	+
• Relatedness	+	-	-
• Adm Expenses	+	+	+
• R&D Intensity	+	-	-
• Advertising Intensity	-	-	-
Interaction Variables			
• Mode&Firm Size	*	If : JV = - ACq = +	If : JV = - ACq = +
• Mode&Relatedness	If : JV = + ACq = -	If : JV = + ACq = -	If : JV = - ACq = +
• Mode&Adm.Expenses	If : JV = + ACq = -	If : JV = + ACq = -	If : JV = - ACq = +
• Mode&R&D	If : JV = + ACq = -	If : JV = + ACq = -	If : JV = - ACq = +
• Mode&Advertising	If : JV = + ACq = -	If : JV = + ACq = -	If : JV = - ACq = +

* Not significant

CHAPTER 6

SUMMARY AND CONCLUSIONS

Studies of FDI in agricultural and food products have been shown to be extremely valuable, especially after the introduction of GMO in the US. Technical barriers have strongly affected trade in this industry and affiliated sectors. EU demands that US genetically altered products imported to their markets be labeled and shipped separately from conventionally produced crops. Labeling and additional required health and environmental tests increase the costs of US exports and consequently, a drop in US soybeans and corn exports to Europe. FDI has thus been an alternative strategy to access foreign markets.

In this study, we focus our analysis on the foreign market entry decisions, specifically on the choices faced by a US food industry firm, as between acquisitions and joint ventures. Food industry firms have very specific features that make this distinction relevant. They establish affiliates abroad for the primary purpose of increasing market share and not of exporting products back to the US. Food products are characterized by being relatively low value-added and moving to the global market provides firms with opportunities to reduce unit costs. Expanding production allows firms to spread their fixed costs for facilities and management over a larger volume. However, companies where GMO products are present have to consider, in addition to the need to tailor products to local tastes and cultural differences, consumer concerns about food safety, the environment, and animal welfare issues that affect demand, especially in many developed countries. Therefore, consumer demand for improved food quality and safety has also led public and private sectors to develop and implement mandatory and voluntary

quality control, management, and assurance schemes, which are changing the way food products are produced, marketed and traded in Europe.

Three economic models were developed to analyze the choice and consequence of foreign market entry mode by US firms. Data were collected from companies that process, or have in their products, GMOs and which entered an EU country in the period of 1990 to 2003. Because we had serious limitations in obtaining information regarding their operations in the foreign market, and therefore a small sample, the fact that it was exclusively from the agricultural and food products industry gives greater confidence in making our inferences and interpretations.

The first model focused on assessing the US food processing companies' determinant factors of the observed entry mode chosen in the European Union countries. A binomial logistic model show was chosen for analysis of the determinant factors of the binary entry mode, acquisition or joint venture. However, the second model, where we applied a Generalized Estimating Equation, proved to be a superior approach for estimating the longitudinal data, where we record each company's responses at multiple points in time. The level of significance for all the estimated coefficients was improved, providing us more confidence in our statistical inferences regarding the constructed hypotheses.

Summary of Results

The results from both model equations are robust and consistent with our hypotheses, excepting for the influence of host country factors to determine (or not) the chosen mode of entry. While in the logistic model the variables representing these factors were not significant, they do show significance in the GEE model.

Of the firm-specific factors, all the characteristics and competitiveness variables of the firm demonstrated significant coefficients. In firm financial performance results, only the variable LEVER, a proxy used for slack financial resources, was not significant in the model estimated by logistic regression; however, it was significant in the estimated GEE model.

The third analysis, a hierarchical multiple regression analysis, examined the effect of mode of entry on the linkages between firms' strategic factors and performance. We show that the use of interaction terms in this model substantively modified the direction of interpretation of many firm-specific factors influencing performance.

Conclusions

Overall, our findings seem to explain very well how firm-specific strategy variables are important in the foreign market entry analysis. Although we had to consider the lack of inclusion of industry variables from the host country in the models, allowing that in most studies their effects have been weaker, one of the major limitations of our work was not to have tested them. However, it is important to realize that no information about the subsidiaries was given from the parents in their reports.

Regarding the econometric methods, the use of random effects in the model may have also improved the statistical analysis. The random effects in our models would represent the influence of each company on its repeated observations that is not captured by the observed covariates. However, the availability of such software programs is relatively recent, especially applied to dichotomous dependent variables.

The results from determinant factors of the foreign industry entry mode, associated with the effects of mode of entry, their costs and performance, provide some important implications for policies, managerial decisions and academic studies. Considering that technical barriers to

trade from the EU versus American GMO product imports is still a reality, food industry policies have to take into account that American companies which decide to have foreign investment in EU will need to receive support from the government in issues related to trade restrictions. Related firm-specific aspects may also need to be enhanced in order to enter into new markets.

Managerial implications in turn, follow directly from our main conclusions. There are specific determinant factors in the food industry that must be considered in an entry mode decision, and the performance of the entering company depends not only on the organizational strategic factors, but also on the interaction between those factors with the chosen entry mode in reducing the cost of entry. For academics, this research provides a theoretical framework that has not previously been applied to agriculture and the food industry. In addition, few studies of the mode of entry between acquisition and joint venture have been done, due mainly to the difficulty of data discovery suitable for such empirical analyses.

In this study we made an assumption that US firms facing export restrictions on GMO products will decide that, instead of producing at home and exporting or making other kinds of contracts, they would establish their own production in the EU market. It may also be useful to know what would be the consequences, in terms mainly of the cost, if the firms decided that, instead of entering the foreign market, they would produce at home and export their products. Certainly, this suggestion is a greater challenge and opportunity for further research.

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APPENDIX

Appendix Table 1: Mergers and Acquisitions in the Food Industry – 1997-2003

	Full Year						
Category:	**2003**	**2002**	**2001**	**2000**	**1999**	**1998**	**1997**
Agricultural Cooperatives	2	4	6	6	7	12	3
Brokers	4	2	6	4	16	14	22
Diversified Firms with Interests in the Food Industry	24	31	22	24	12	20	11
Food Processing Firms:	104	98	146	172	229	230	186
Bakers	2	11	8	8	18	19	20
Brewers	0	1	3	3	5	6	5
Confectioners	11	5	6	4	4	5	7
Diversified Food Processing Firms	37	37	67	86	112	140	103
Dairy Processors	8	10	12	19	24	27	15
Fruit & Vegetable Processors	29	23	33	18	32	b.	b.
Meat Processors	11	4	5	9	18	14	12
Poultry Processors	3	0	6	11	6	12	8
Seafood Processors	0	6	3	10	4	3	7
Snack Food Processors	3	1	3	4	6	4	9
Investment Firms/Banks	29	42	26	29	37	26	a.
Nonfood Marketers selling Through Supermarkets	0	0	0	0	0	0	3
Packaging & Equipment Suppliers	22	13	28	52	28	46	13
Raw Product Suppliers	3	3	10	16	28	44	31
Restaurants & Foodservice	61	46	61	91	112	140	127
Retailers:	42	27	45	53	66	67	54
Convenience Stores	3	3	9	11	11	10	6
Supermarkets	35	19	27	24	34	39	25
Others	4	5	9	18	21	18	23
Soft Drink Bottlers	17	16	14	15	30	20	17
Sugar Refiners	1	1	0	0	0	3	1
Wholesalers:	32	35	40	48	63	71	76
Foodservice	17	16	18	28	31	38	36
Grocery	15	19	22	20	32	33	40
Foreign Acquisitions of U.S. Firms:							
By Canadian Firms	13	10	10	13	7	15	18
By Other Foreign Firms	22	33	40	50	34	39	36
e-commerce	3	7	24	NA	NA	NA	NA
Unclassified a.	36	45	38	68	84	66	136
TOTAL	**415**	**413**	**516**	**641**	**753**	**813**	**734**

Food Institute Analysis (2004)

Appendix Table 2: SIC Codes and the Respective NAICS Codes for Food Products

SIC	US SIC DESCRIPTION	NAICS	US NAICS DESCRIPTION
20	Food and kindred products	**311**	Food manufacturing
2032	Canned specialties	**311422**	Specialty canning
2035	Seasonings and salad dressings	**311941**	Mayonnaise, dressing and other prepared sauce manufacturing
2041	Flour and other grain mill products	**311211**	Flour milling
2043	Breakfast cereal	**311230**	Breakfast cereal manufacturing
2045	Prepared flour mixes and dough	**311822**	Flour mixes and dough manufacturing from purchased flour
2046	Refining purchased oil	**311225**	Fats and oils refining and blending
2051	Bread and other bakery products, except cookies and crackers	**311811**	Commercial bakeries
2052	Cookie and cracker	**311821**	Cookie and cracker manufacturing
2064	Non-chocolate confectionery	**311340**	Non-chocolate confectionery
2075	Soybean processing	**311222**	Soybean processing
2083	Malt	**311213**	Malt manufacturing
2087	Flavoring syrup and concentrate, except coffee	**311930**	Flavoring syrup and concentrate manufacturing
2096	Potato chips, corn chips, and similar snacks	**311919**	Other snack food manufacturing

Appendix Table 3: Company Name and their Respective SIC Codes

Company Name	Country Code	SIC Code
Archer Daniels Midland	USA	2041 2079 5133 2046 2074 2075
Campbell Soup	USA	2032 2052 2035 2038 2051
ConAgra's Food Incorporation	USA	2011 2033 2879 2041 2099
General Mills	USA	2099 2043 2024 2051 2052 2026
Heinz HJ Company	USA	2035 2038 2034 2023 2092 2033 2099 2048
Hershey Foods Corp.	USA	2066 2064 2032 2052 2099 5812
Kellogg Company	USA	2043 2038 2064
Kraft Foods Inc.	USA	2043 2066 2022 5147 2052 2099 2095
Nabisco	USA	2052 2043 2111 2079 2060 2048 6719
Pepsico Inc.	USA	2096 2086 2043 2099
Sara Lee	USA	2251 2322 2051 2013 2095 2844

Appendix Table 4: Correlations among Defined Variables[a]

VARIABLES	MODO	GEO	GNPCAP	FDIGDP	RIRATE	LOGEMP
MODO	1	-0.433	0.076	0.157	-0.132	-0.108
GEO	-0.095	1	0.084	-0.26	0.176	-0.178
GNPCAP	0.0766	0.084	1	0.076	-0.408**	-0.112
FDIGDP	0.157	-0.260*	0.076	1	-0.569*	0.176
RIRATE	-0.132	0.176	-0.408***	-0.569***	1	0.137
LOGEMP	-0.108	-0.178	-0.112	0.176	0.137	1
STAG	0.57***	0.019	-0.071	0.059	0.009	-0.431***
IEXP	0.377**	-0.251*	-0.13	0.226*	-0.062	0.196
NSUBO	0.056	-0.134	-0.017	0.123	-0.205*	-0.234*
NSUB	-0.056	0.134	0.017	-0.123	0.205*	0.234*
INTSALES	0.163	-0.236*	-0.021	0.21	-0.2	-0.062
DIV	-0.054	0.095	-0.077	0.078	0.093	0.407***
RELTN	-0.121	-0.001	0.16	0.024	-0.273*	-0.203
RND	0.135	0.117	-0.152	0.055	0.176	-0.065
PERINT	0.338**	-0.237*	0.062	0.424**	-0.264*	0.322**
ADVA	0.114	0.19	0.033	0.04	0.039	0.348**
LEVER	-0.128	-0.111	-0.137	0.17	0.002	0.397***
ADMEXP	0.278*	-0.062	-0.224*	0.228*	0.136	0.382***
TURNOV	-0.26*	0.01	0.113	-0.187	0.149	0.182
CAPSAL	-0.158	0.055	0.243*	-0.243*	0.119	0.248*
VIF		1.808	1.602	2.561	2.885	20.903

[a] n = 69; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Appendix Table 4: Correlations among defined variables[a] (continuation)

VARIABLES	STAG	IEXP	NSUBO	NSUB	INTSALES	DIV	RELTN
MODO	0.578***	0.377***	0.056	-0.056	0.163	-0.054	-0.121
GEO	0.019	-0.251	-0.134	0.134	-0.236	0.095	-0.001
GNPCAP	-0.071	-0.13	-0.017	0.017	-0.021	-0.077	0.16
FDIGDP	0.059	0.226*	0.123	-0.123	0.21	0.078	0.024
RIRATE	0.009	-0.062	-0.205*	0.205*	-0.2	0.093	-0.273
LOGEMP	-0.43***	0.196	-0.234*	0.234*	-0.062***	0.407*	-0.203**
STAG	1	0.443***	0.177	-0.177	0.363**	-0.016	-0.269*
IEXP	0.443***	1	0.541***	-0.541***	0.504***	-0.048	-0.321**
NSUBO	0.177	0.541***	1	-1.000***	0.359***	-0.061	-0.154
NSUB	-0.177	-0.541***	-1.00***	1	-0.395***	0.061	0.154
INTSALES	0.363**	0.504***	0.395***	-0.395***	1	0.125	-0.072
DIV	-0.016	-0.048	-0.061	0.061	0.125	1	-0.186
RELTN	-0.269*	-0.321**	-0.154	0.154	-0.072	-0.186	1
RND	0.326**	-0.089	-0.392***	0.392***	-0.126	-0.166	0.121
PERINT	0.239*	0.302**	-0.039	0.039	0.121	0.117	-0.293**
ADVA	-0.048	0.255*	-0.183	0.183	-0.132	-0.53***	-0.053
LEVER	-0.144	0.171	0.165	-0.165	0.259	0.38***	-0.032
ADMEXP	0.239*	0.560***	-0.132	0.132	0.078	0.154	-0.285**
TURNOV	-0.51***	-0.657***	-0.454***	0.454***	-0.483***	0.066	0.262*
CAPSAL	-0.327**	-0.481***	-0.452***	0.452***	-0.585***	0.236*	0.097
VIF	7.774	21.467	6.879	6.879	3.593	7.460	1.978

[a] n = 69; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Appendix Table 4: Correlations among defined variables[a] (continuation)

VARIABLES	RND	PERINT	ADVA	LEVER	ADMEXP	TURNOV	CAPSAL
MODO	0.135	0.338**	0.114	-0.128	0.278*	-0.260*	-0.158
GEO	0.117	-0.237*	-0.19	-0.111	-0.062	0.01	0.055
GNPCAP	-0.152	0.062	0.033	-0.137	-0.224	0.113	0.243**
FDIGDP	0.055	0.424**	0.04	0.17	0.228	-0.187	-0.243
RIRATE	0.176	-0.264*	0.039	0.002	0.136	0.149	0.119
LOGEMP	-0.065	0.322	0.348**	0.397***	0.382***	0.113	0.243*
STAG	0.326**	0.239*	-0.048	-0.144	0.239*	-0.187	-0.243*
IEXP	-0.089	0.302*	0.255**	0.171	0.560***	0.149	0.119
NSUBO	-0.392***	-0.039	-0.183	0.165	-0.132	0.588***	0.173
NSUB	0.392***	0.039	0.183	-0.165	0.132	0.182	0.248*
INTSALES	-0.126	0.121	-0.132	0.259	0.078	-0.509***	-0.327**
DIV	-0.166	0.117	-0.527***	0.381**	0.154	-0.657***	-0.481***
RELTN	0.121	-0.293**	-0.053	-0.032	-0.285**	-0.454***	-0.452***
RND	1	0.049	0.307**	0.031	0.332**	0.454***	0.452***
PERINT	0.049	1	0.301**	0.062	0.260*	-0.483***	-0.585***
ADVA	0.307**	0.301**	1	0.011	0.178	0.262*	0.097
LEVER	0.031	0.062	0.011	1	0.178	0.145	-0.159
ADMEXP	0.332**	0.260*	0.178	0.178	1	-0.465***	0.013
TURNOV	0.145	-0.465***	-0.011	-0.09	-0.222*	1	0.527***
CAPSAL	-0.159	0.013	0.068	-0.215*	-0.241*	0.527***	1
VIF	6.064	4.524	8.082	2.552	6.419	7.174	4.888

[a] n = 69; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Appendix Table 5: Results of Logistic Regression Analysis of the US Food Firms' Mode of Entry into the EU, 1990-2002, for the Eliminated Variables [a]

Variables	Mode of Entry			
	Equation 1	**Equation 2**	**Equation 3**	**Equation 4**
Intercept	-6.710	-19.917*	-24.358**	-6.934*
GEO	0.192			
GNPCAP		0.020		
FDIGDP			0.178	
RIRATE				-0.150
LOGEMP	-9.122**			
STAG		4.854**	6.241**	3.838**
LOGIEXP		10.101*		
NSUB				-0.030
NSUBO	0.152*		0.224*	
INTSALES				-0.042
DIV				
RND	-2.927*	-2.750	-6.651*	-0.707
PERINT	0.273**	0.084*		0.057
RELTN				
ADVA		-0.769		
ADMEXP	0.350**		0.279*	
LEVER				0.056
TURNOV	6.444*	5.054*	7.906**	
CAPSAL				
ADMDIV				
ADMREL				
LL Ratio	34.457***	39.578***	45.053***	31.217***
Score	17.965*	31.039***	31.857***	26.781***
Wald	11.650	17.261*	14.804*	15.648*

n = 69; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$