The Performance of Multinational Agribusinesses: Effects of Product and Geographical Diversification

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INTRODUCTION

In this chapter, we will study the impact of geographical and industrial diversification on the growth rates of the world's 100 largest food and drink multinationals (the top group). Among the large firms that influence the food and beverage (F&B) industry worldwide, growth has been an important issue, possibly even more important than for multinationals in other industries. These firms account for one-third of production (Rastoin et al., 1998) and more than one-half the technological activities of the world food and beverage industry (see Chapter 3). Food and beverage multinationals (FBMs) have often aimed at gaining size. They perceived that large companies had the opportunity to enter new, profitable markets for foodstuffs (sauces, precooked food, etc.) while keeping oligopolistic control over markets for basic foodstuffs (sugar, flour, etc.), where margins are thinner. Small companies often lack this possibility because they cannot balance thin margins with the enormous volumes of foodstuffs marketed by the largest firms. The firms analyzed in this chapter grow at an average annual rate 3 to 4 percent higher than that of global F&B production (Rastoin et al., 1998). However, they have been losing dy-

namism over recent years. The exceptions are large companies from Japan and some European countries, which are expanding swiftly. For rival firms, this could also be a matter of concern.

Analyzing the effect on FBM growth of diversification could help to fill a gap in international business studies, since their specificities could be concealed in cross-sectional analyses that would include all kinds of multinationals. For instance, country spread could be a key aspect of geographic diversification particularly important in the route to expansion of FBMs. Proximity to the market is crucial for multinationals in consumer products (Ietto-Gillies, 2002). On the other hand, FBMs serve foreign markets by foreign production rather than by exports (Pearce, 1993). Finally, unlike international manufacturers of cars or computers, FBMs interact with varied national consumers. Although diets tend toward homogeneity, especially in North America and Western Europe (Connor, 1997), peculiarities of national consumptions remain substantial (Christensen, Rama, and von Tunzelmann, 1996).

Another characteristic of FBMs is that they could be considered precursors to other multinationals because they are, on average, older and internationally more experienced (Stopford and Dunning, 1983). Thus, the analysis of FBMs helps toward a better understanding of the rationale of other international businesses.

The longevity of FBMs seems to be associated with their strategies of growth. Leading FBMs have sometimes survived for more than a century thanks, among other reasons, to their strategies of diversification into a variety of industrial and geographic markets. By spreading into new industries in the domestic market and investing abroad, large U.S. producers of branded and packaged foods, such as Borden, Heinz, Campbell Soup, or Del Monte, grew continuously throughout the first decades of the twentieth century (Chandler, 1990). Food leaders diversified their lines of products chiefly to exploit economies of scope in distribution; many also invested in retailing outlets. Their strategies were very effective. Unlike very large U.S. and British F&B companies, most of the giant firms that dominated the German F&B industry by the end of the nineteenth century did not survive, for reasons that included the failure of German enterprises to diversify in time into either new products or new geographic markets. Even today, very few German companies are among the world's 100 largest FBMs.[1] Leading U.S. food manufacturers went on diversifying into

new product markets from 1919 to 1972, but this trend stabilized toward the end of the 1970s (McDonald, Rayner, and Bates, 1989).

During the 1980s, doubts about the current effectiveness of unrelated diversification started to be cast. Researchers suggested that related diversification was superior to unrelated diversification because the latter discourages synergies among activities (Palich, Cardinal, and Miller, 2000; Palich, Carini, and Seaman, 2000). Knowing which type of industrial diversification is more conducive to good performance is important, since many large F&B firms are conglomerates (unrelated companies), a characteristic of the industry that has increased since the 1980s, when several giant companies from other sectors, especially the tobacco industry, diversified into F&B (Rama, 1992). Since the 1980s, analysts also began encouraging F&B firms to focus on core businesses and divest from noncore businesses (Ding and Caswell, 1995).

This advice was followed by most large F&B enterprises. In a sample of ten large U.S. food-manufacturing companies, only five reduced their unrelated diversification over 1981-1989 and focused, as recommended, on related diversification (Ding and Caswell, 1995). Over the 1980s and early 1990s, however, the world's largest F&B companies invested billions of dollars in mergers and acquisitions (M&A) (see Chapter 1), chiefly because they wanted to purchase new concerns in their trade and divest from unrelated, often unprofitable businesses. Among the world's 100 largest FBMs (hereafter, the top group), sales of nonfood products as a proportion of total sales fell from 25.7 to 11.2 percent from 1981 to 1988, a decline suggesting increased concentration in core businesses (Rama, 1998). We do not know, however, if such a strategy actually stimulated growth, because rates of growth by FBMs tended to decline over the 1990s.

The geographic diversification of FBMs poses additional questions. Though anecdotal evidence suggests that the companies have expanded quickly worldwide over recent periods, we do not know exactly where such firms have been expanding and whether companies from different countries display different geographic strategies.

Even the effectiveness of such a strategy is now controversial. Rugman (1996) has argued that multinational firms can reduce their profit risk by engaging in foreign operations. Some researchers based on Penrose's (1959) work have suggested, however, that the burden of organizing networks all over the world could harm the performance

of the highly international company. In an era of global expansion of FBMs, it is useful to explore this topic in detail. Some important aspects have been analyzed in Chapter 1. However, multinationality has many other facets; their influence on performance will be studied here. The number of countries into which a firm expands, the share of foreign affiliates in total affiliates, or the number of affiliates by host country could each affect the rate of growth in different and even antagonistic ways.

Here we investigate firms belonging to a variety of home countries as well as industries; to analyze them, we use panel data covering 1985 to 1996. The next section reviews the theoretical background that informs this investigation. The subsequent sections present the data and the empirical analysis, a discussion of our results, and some conclusions.

THEORETICAL BACKGROUND

Because the number of studies dealing with industrial and geographical diversification in FBMs is limited, we also supplement our research with studies covering nonfood multinationals and single-country firms.

Industrial Diversification

Over the past three decades, researchers have devoted an enormous amount of attention to industrial diversification, i.e., expansion into product markets new to a firm (Hitt, Hoskisson, and Kim, 1997). The topic has become "the dominant research stream in the field of strategic management" (Sambharya, 2000, p. 163).

Authors have used different tools to measure diversification and have consequently pursued different inquiries. The authors who have measured the number of industries into which firms have diversified (the quantitative approach) have chiefly investigated whether diversified firms were more profitable than single-business companies. In general, the response has been that diversified firms enjoy more advantages (for instance, economies of scope) than single-business companies (Palich, Cardinal, and Miller, 2000). The researchers who have used a qualitative approach, based on the underlying expansion logic behind the company behavior (Sambharya, 2000), have posed a

different question: Does the diversified-related enterprise perform better than the unrelated enterprise (conglomerate)? Rooted in the resource-based theory of the firm (Penrose, 1959), some authors have replied that the related firm performs better because it can minimize risks, cross subsidize different lines of businesses, spread the prestige of its brands into a variety of products, distribute the costs of already capitalized assets, or exploit interrelationships between different technologies and marketing channels (for a survey of studies on industrial diversification, see Palich, Cardinal, and Miller, 2000; for critical views of theories of diversification based on economies of scope and transaction-cost economics, see Dosi, Teece, and Winter, 1992). Other authors, however, have noticed that in practice synergies are difficult to achieve because related firms need great financial resources and managerial ability to exploit interrelationships. Markides and Williamson (1994) point, moreover, to the firm needing strategic relatedness (brands, distribution, technology) in addition to market relatedness in order to obtain full benefits from its diversification strategy. Dass (2000) suggests that abrupt changes in product diversity could have negative effects on performance. On the other hand, as some authors claim, diversification into nonrelated activities can reduce a firm's ability to grow since it increases the complexity of the network (Williamson, 1975). Others argue, though no evidence is yet provided, that the important question is whether lines of business, even if not related within the same two-digit industry, display coherence, i.e., common technological and marketing characteristics (Dosi, Teece, and Winter, 1992).

Unfortunately, studies devoted to industrial diversification and performance in multinationals are not conclusive. The highly international firm often develops complex structures which could constrain its growth because they involve large organizational and management costs. Analyzing 200 U.S. and European multinationals in all industries over 1977-1981, Geringer, Beamish, and daCosta (1989) remark that related companies tended to perform better than unrelated ones. Among Japanese multinationals analyzed over 1977-1993, this could also be the case, but it was not always so (Geringer, Tallman, and Olsern, 2000).

The situation in FBMs is little known because analyses on this topic are rare. A study of sixty-four major FBMs finds that related companies, highly diversified within the food and beverage industry,

grew faster than other FBMs over 1977-1988 (Rama, 1998). However, the study argues that related companies did not necessarily outperform their rivals over the early 1990s, probably because concentration in core businesses had become by then a fairly extensive strategy in the international agrofood sector. As mentioned, marketing and technological coherence are important. Analyzing 792 very large enterprises from a variety of industries, another study notices that in 1982 food companies were less diversified than other manufacturing firms (Pearce, 1993). The author argues that one reason why food, drink, and tobacco firms spread within these industries as well as into chemicals or pharmaceuticals is that such products are often marketed through similar channels (supermarkets, drugstores, etc.). This circumstance, he adds, contributed to economies of scope. In our view, the FBM holding chemicals businesses could enjoy not only marketing but also technological economies of scope because of often developing innovative activities in chemicals (see Chapter 3).

Over time a consensus has tended to emerge in empirical studies. Palich, Cardinal, and Miller (2000), who surveyed and synthesized eighty-two quantitative studies on the diversification-performance linkage, conclude that most empirical results support the curvilinear model: diversified firms tend to outperform less-diversified ones, although performance declines as companies venture into a greater number of unrelated industries.

Diversification into upstream and downstream industries such as agriculture or retailing (vertical relatedness) poses other questions. Though multinational agribusinesses often diversified into agriculture during their early expansion (Dunning, 1993), traditional vertical relatedness seems to no longer be a source of good performance. In the top group of FBMs, the companies that held farms (in addition to food and drink factories) were not necessarily fast growers over 1977-1994; those holding retail outlets grew above average in the 1970s and 1980s but not in the 1990s, when relationships between food manufacturers and retailers became less antagonistic (Rama, 1998). This result coincides with that of Fan and Lang (2000) who find, in a sample of around 5,000 firms from all manufacturing sectors, that vertical relatedness is associated with poor performance. However, when a firm diversifies into knowledge-creating activities it can utilize its experience and resources in ways leading to lowering the costs of expansion (Cantwell, 1989; Cantwell and Hodson, 1991).

In a sample of sixty-four large FBMs, those that had diversified into biotechnology, veterinary services, microbiological products, and other activities high in technological content grew swiftly over 1977-1988, allowing for size, multinationality, profit, and other types of industrial diversification (Rama, 1998).

Here we test whether vertical relatedness helps FBMs to expand. We explore the effects of diversification into agriculture, retailing, and high-tech activities (checking for other factors of growth).

Geographical Diversification

Researchers do not agree regarding the effects on performance of geographical diversification, i.e., expansion of the company into different geographical markets. First, it is not clear if highly international companies are fast growers. Some authors find that the effects of multinationality on performance are very weak, if any (Tallman and Lee, 1996). When comparing 143 multinationals and 128 very large domestic firms of various sectors, Cantwell and Sanna-Randaccio (1993) observe, moreover, that the companies that had remained domestic grew faster. Siddarthan and Lall (1982), who studied the largest U.S. multinationals at the end of the 1970s, found that multinationality exerts a negative influence on growth. Second, some authors argue that the association between multinationality and performance is not linear. Among 200 large U.S. and European multinationals, Geringer, Beamish, and daCosta (1989) find that, whatever their continent of origin, highly international companies perform better. However, after a point, performance peaks and tends to diminish. According to the authors, the costs associated with geographic dispersion could escalate after some "internationalization threshold." Finally, authors of other studies notice that the effects of multinationality on performance seem to change both across and within industries. In their subsample of 143 large multinationals, Cantwell and Sanna-Randaccio (1993) observe two different statistical results, depending on the characteristics of the industry to which the company belongs. Only in global, i.e., internationally integrated, industries does the highly international company grow faster than the less international one (controlling for size, technology, and market power).[2] By contrast, in multidomestic industries (non–internationally integrated industries), highly international firms are not necessarily fast

performers. The authors explain that, in such industries, the highly international firm endures the costs of a complex organization without benefiting from the integrated networks needed to exploit locational advantages of supply and demand; thus it performs less well. Since the F&B industry is considered multidomestic (not global), we could infer that highly international food firms tend to grow slowly, though Cantwell and Sanna-Randaccio's results are not disaggregated by industry. A sectoral study shows, however, that some highly international food firms are actually fast growers (Rama, 1998). Effects of multinationality are negative in old, experienced FBMs but not in younger FBMs. Old and experienced FBMs are more likely than younger, less experienced ones to have moved from old (North America, Western Europe) to new geographic national markets, which are often deprived of adequate retailing facilities or initially reluctant to adopt a foreign diet. Owing to such handicaps, the FBM could have endured some periods of restrained growth.

Here we test whether highly international FBMs grow faster (other determinants of growth also checked for). Given that previous findings could diverge because authors use different measures highlighting different angles of the question, we test the hypothesis with a variety of proxies of geographical diversification.

DIVERSIFICATION, SIZE, AND RATE OF GROWTH

This section provides an insight into the diversification, size, and growth of FBMs.

The Data

Our sample of FBMs comprises 100 companies included in the top group over the late 1980s to 1996 (see Appendix). The source of the information is AGRODATA (Institut Agronomique Méditerranéen de Montpellier [IAMM], 1990; Padilla et al., 1983; Rastoin et al., 1998). Produced by IAMM (France), this database has gathered information on the world's 100 largest food multinationals since the 1970s. The firms in our sample are active in a variety of industries, including meat processing, confectionery, dairy products, canned specialties, and spirits. All are food or beverage processors, and a num-

ber of them also have agribusinesses and other concerns. The sources for AGRODATA are *Moody's Industrial Manual,* the Fortune Directory of the 500 largest U.S. and the 500 largest non-U.S. corporations, the "Dossier 5,000" of the largest European companies published by *Le Nouvel Economiste,* Dun & Bradstreet, and the annual reports of the enterprises, among others.

Researchers measure industrial diversification in multiple ways, each with its own merits and shortcomings (for surveys, see Davis and Duhame, 1995; Fan and Lang, 2000; Sambharya, 2000). Here we test whether diversified FBMs, both related and unrelated, grow quickly (after allowing for size, financial variables, and geographical diversification). In addition to counting the four-digit SIC categories in which the FBM operates, as studies in the *quantitative* stream do, we measure the economic weight of related activities, i.e., the food sales/total sales ratio at the company level. Because the advantage of the related firm is in business synergy, the economic *dimension* of related networks (not only their complexity) is important. Researchers also measure geographical diversification using different proxies, which throw light on different angles of the picture (for a review, see Dörrenbächer, 2000). Some authors use more than one variable in the same equation since they recognize that different aspects of internationalization could have different, and even antagonistic, results on company growth. For instance, Cantwell and Sanna-Randaccio (1993) use six variables measuring internationalization in their model to better specify the route to growth in global industries. In our equation, we use three: country spread; the ratio of foreign affiliates to total number of affiliates; and ratio of foreign affiliates to total number of host countries. The three variables measure different aspects of internationalization. Country spread, which reflects the number of geographic markets in which the company is active, seems, as stated previously, especially important for FBMs. The foreign affiliates/total affiliates ratio measures the international projection of the company and the relative emphasis on foreign versus domestic activities. It is comparable to the foreign sales/total sales ratio (Ietto-Gillies, 2002).[3] The foreign affiliates/total host-countries ratio measures the complexity of networks at the host-country level. Organizing different businesses within the same host country, for instance, is considered to be a complex task (Prahalad and Doz, 1987). This situation could oc-

cur when multiproduct companies, such as those studied here, establish many affiliates by country.

Diversification Patterns in Food and Beverage Multinationals

The purpose of this section is twofold. First, we describe the pattern of industrial and geographical diversification of the world's 100 largest FBMs. In doing so, we provide a description of the sample in both aspects of diversification, as well as other basic characteristics of the firms (i.e., size and growth rates) over 1985 to 1989 and 1990 to 1996. We calculate averages of the variables for groups of companies and by company for both periods.

Time averages for individual firms are calculated as follows:

$$\overline{V}_i = \frac{1}{T}\sum_{t=1}^{T} V_{it} \tag{2.1}$$

where i represents the company, t is the time horizon, and V is one of the variables considered in this chapter.

Group averages for firms with common characteristics are calculated in this way:

$$\overline{\overline{V}} = \frac{1}{N}\sum_{i=1}^{N} \overline{V}_i \tag{2.2}$$

where again i represents the company.

Here we use the time average for individual firms (see Equation 2.1) to construct group averages for companies displaying common characteristics, i.e., FBMs from the same home country or home region. This enables us to obtain means and statistics across different time periods and different companies at the same time. It is a straightforward way of aggregation over different firms and time periods. Second, as mentioned, we empirically explore the linkages between variables measuring the growth of a company and its diversification status.

Using data on the affiliates, domestic and foreign, Table 2.1 shows the industrial and geographic diversification of the firms. Data refer to the percentage of affiliates each firm possesses in each geographical region and industrial sector. Equivalent data concerning sales are unavailable. On the horizontal axis, the first column reports the home region of the firm; the second names the host region. The vertical axis

represents the industrial activity of the affiliate. The categorization is based on Rama (1998), who used the United Nations-Standard Industrial Classification of the affiliates provided by AGRODATA (see Table 2.7).

Most FBMs Locate in the Home Region and Diversify Within Core Businesses

Geographical diversification varies with the origin of the FBM, though, on average, the majority of the affiliates locate in the parent company's home region. The percentage of affiliates located in the home region to the total number of affiliates ranges from 42.4 percent for North American (United States and Canada) multinationals, which seem to be overall the most geographically diversified, to 70.3 percent for European companies, the least geographically diversified (see Table 2.1). An F-test confirms that, as already mentioned, home-country and geographic strategies are statistically associated ($F = 5980.7$; $p = 0.01$).

Regarding industrial diversification, the majority of affiliates, as expected, are gathered within the core sector of the firm, i.e., F&B (see Table 2.1). The exceptions are again North American firms, which tend to diversify into noncore businesses: 46.4 percent of their affiliates are in other activities, i.e., nonfood. By contrast, the most focused on core businesses are the European FBMs. Companies from different home countries tend to accord different relative importance to different businesses. Asian (mostly Japanese) FBMs give special importance to their technologically related affiliates, the majority also located in Asia. The percentage of North American affiliates specializing in technology is below that in European and, especially, Japanese FBMs. This does not necessarily mean that North American FBMs devote less attention to innovative activities than their foreign rivals. It may well be that multinationals based in different countries organize their R&D activities in a different manner and that North American companies develop theirs in laboratories within manufacturing plants, rather than in specialized affiliates as the Japanese FBMs do. However, the small diversification into specialized laboratories of North American FBMs could be related to the downward trend in the number of their patents, a proxy for innovative activities, which is analyzed in Chapter 3. On the other hand, Japanese and

European FBMs diversify much more into retailing than other FBMs. Finally, firms based in Asia and the rest of the world often spread into agricultural businesses. Japanese FBMs invest heavily in fisheries and other primary activities aimed at supplying the home country with food and agricultural products through exports. As will be seen in Chapter 7, Australian and New Zealand companies are also involved in agricultural concerns. A chi-square test shows that home country and behavior of the firm in regard to industrial diversification are statistically associated ($\chi^2 = 17918.2$; $p = 0.01$).

Combining both forms of diversification, we can analyze the geographic distribution of specific businesses within the multinational. Table 2.1 shows a picture of the relative importance of host countries to FBMs in each business. In their F&B businesses ("Within Core" column in the table), North American multinationals operate similar percentages of affiliates in Europe and in North America; the same occurs with retailing businesses. Their affiliates in nonfood businesses ("Other" column) settle in the home region, but location in Europe is also substantial. North American FBMs are an exception; all the other FBMs establish the majority of their affiliates in the same region as the parent and within core activities.

The Economic Weight of Core Businesses Has Remained Stable

As previously noted, the F&B sales/total sales ratio is used here as a proxy for the economic weight of related activities in the company. Table 2.2 presents the percentage of F&B sales in total sales for two time periods and the major home countries/regions. Two points emerge. First, as shown by a difference of means test, patterns of F&B sales/total sales remained stable ($t = 0.151$; $p > 0.10$). In general, FBMs did not intensify, over the study period, the strategy of sticking to core businesses that started at the beginning of the 1980s (Rama, 1998). Second, an exception is given by Japanese FBMs, since their F&B sales/total sales ratio increased from 1985-1989 to 1990-1996 ($t = 1.522$; $p = 0.10$). In addition, Japanese firms displayed the largest ratio in the sample (94.5 percent in 1990 to 1996) and the smallest standard deviation from the mean (9.2 percent), suggesting that such companies are strongly committed to their main core business.

Home country	Food/total sales Mean	SD	Min	Max
		1990-1996		
United States	88.80	21.51	10.75	100.00
Europe	89.14	19.54	13.50	100.00
United Kingdom	89.85	14.59	32.20	100.00
France	90.44	19.79	34.68	100.00
Rest of Europe	88.05	23.05	13.50	100.00
Japan	94.66	9.19	59.84	100.00
Rest of world	84.31	22.92	38.34	100.00
Total	89.85	18.93	10.75	100.00
		1985-1989		
United States	87.97	19.79	14.16	100.00
Europe	90.05	17.07	17.27	100.00
United Kingdom	90.61	10.34	66.92	100.00
France	91.08	15.68	52.08	100.00
Rest of Europe	88.74	24.20	17.27	100.00
Japan	92.57	12.38	39.35	100.00
Rest of world	85.93	20.68	41.52	100.00
Total	89.68	17.39	14.16	100.00

Source: Authors' calculations based on AGRODATA

The Pattern of Geographic Diversification Experienced Some Changes

As already mentioned, we will use three different measures of geographical diversification: the total number of foreign countries in which the firms have established foreign affiliates; the ratio of foreign to total affiliates; and the ratio of foreign affiliates to foreign countries (see Table 2.3). The combination of these measures will give us a global picture of the geographical diversification in FBMs.

The first part of Table 2.3 reports the average number of foreign countries in which the firm has established operations through a foreign affiliate. The sample contains firms operating in just one foreign country as well as companies operating in ninety-eight different nations by 1996.[4] The evolution of this variable suggests that enterprises from most home countries have become increasingly international over the period analyzed in this chapter. A difference of means test indicates significant differences between 1985 to 1989 and 1990 to 1996 in the country spread of FBMs. The sole exception is provided by FBMs based in the rest of Europe and rest of the world, since the average number of countries in which they disseminated remained unchanged (see Appendix).

By contrast, as shown by a difference of means test, the ratio of foreign to total affiliates remained on average stable ($t = 0.832$; $p > 0.10$). From 1985-1989 to 1990-1996, differences in this ratio were apparent only for British FBMs ($t = 2.199$; $p = 0.01$). This result is similar to that of Ietto-Gillies (2002) for British multinationals in mining and manufacturing, which also increased their international projection. French firms and FBMs based in the rest of Europe were the only ones to settle most of their affiliates in foreign countries over both periods.[5]

Our last measure of diversification is the ratio of established foreign affiliates to the number of foreign countries in which the firm operates. As shown by a difference of means test, from the 1980s to the 1990s, the pattern does not change a great deal ($t = .133$; $p > 0.10$). There are two exceptions. American FBMs significantly increased the number of affiliates they have by country ($t = 2.062$; $p = 0.01$) and British FBMs significantly reduced theirs ($t = -3.113$; $p = 0.01$). French and Japanese firms seem to be the only ones to establish, on average, more than three foreign affiliates in each host country.

In short, although differences between home countries are apparent, the average FBM increased, over the period, its geographic spread. Simultaneously, it maintained the same emphasis on foreign networks versus domestic ones and kept the same organization at the host-country level. It preferred to spread to many nations rather than deepen its already established positions within countries.

U.S. Food and Beverage Multinationals Are the Largest in Our Sample

This section analyzes the size of FBMs. Though in the econometric analysis we will use size as measured by employment, here we will use two measures of firm size, total assets and employment, in order to show that the characteristics of size are similar whatever the proxy we use. The variables are, respectively, the total assets of the company measured in current U.S.$[6] and the global employment measured as the total number of employees. We present the statistics for both in Table 2.4.

U.S. companies are the largest in our sample whether size is measured in assets or in employment. However, this information should be balanced against that provided by indicators of dispersion, since U.S. multinationals also show the largest standard deviation (SD) of the asset variable. When we measure size by the employment, U.S. firms continue to hold the first position over both periods; Japanese companies remain the smallest. Japanese multinationals are only one-eighth of the size of the average U.S. firm, as measured by assets, and one-half as measured by employment.

Food and Beverage Multinationals Lose Dynamism

As mentioned in the introduction, when FBMs reduced their sales of nonfood products, which was considered a strategy enhancing performance, their rates of growth also tended to fall. In the econometric analysis we will use the growth of sales as the dependent variable. In this section, however, we will use three different measures to capture firm growth over 1985-1996[7]: growth in terms of total assets, employment, and sales (see Table 2.5). We will show that the results, as with size, are similar whatever the indicator.

Whatever the indicator used, on average, FBMs grew much more slowly during the 1990s than over 1985-1989.[8] No matter what measure we use, the growth leaders are French firms and companies from other European countries, which grew almost twice as quickly as multinationals based in other regions.

ECONOMETRIC SPECIFICATIONS

As mentioned, the aim of this chapter is not only to describe the pattern of geographical and industrial diversification but also to provide empirical evidence on the impact of diversification on firm growth. We use panel-data econometric techniques. This is the most efficient use of the data set, because it combines data for individual units (firms) with data for different time periods.

Our econometric model is built on two functions identified by Cantwell and Sanna-Randaccio (1993),[9] based on the work of Downie (1958) and Penrose (1959). We will use a reduced-form equation of the system. Since it is a standard finding that firm size and growth follow a lognormal distribution, the system can be specified as follows:

$$Log(GROWTH_i) = \alpha_0 + \alpha_1 Log(PROF_i) \tag{2.3}$$

$$Log(PROF_i) = \beta_0 + \beta_1 Log(GROWTH_i) + \beta_2 Log(SIZE_i) + \beta_3 X_i + \beta_4 Z_i + \beta_5 M_i \tag{2.4}$$

Substituting Equation 2.4 into Equation 2.3, we obtain the reduced-form equation of the system, which has the following form:

$$Log(GROWTH_i) = \gamma_0 + \gamma_1 Log(SIZE_i) + \gamma_2 X_i + \gamma_3 Z_i + \gamma_4 M_i \tag{2.5}$$

Model Specification

After a careful examination of the data we decided to use a one-way error component model. The model is of the following form:

$$y_{it} = \alpha + X'_{it}\beta + Z'_i\gamma + M'_{it}\delta + u_{it} \tag{2.6}$$

where $i = 1, \ldots, N$ denotes firm i and $t = 1985, \ldots, 1996$ denotes the year, and y_{it} is the dependent variable measuring growth[10]; α is a scalar; β is a 3x1 vector of coefficients of the control variables; X_{it} is the itth observation on the three control variables of size ($SIZE_{it}$), lever-

age (LEV_{it}), and capital intensity (CAP_{it}). Their description can be found in the following list.

$SIZE_{it}$ (firm's size): Logarithm of the total number of employees for firm i and time t
LEV_{it} (leverage ratio): Total debt/capital of the firm
CAP_{it} (capital intensity ratio): Fixed assets/total number of employees

Z_i is the measure of industrial diversification as represented by the variables in the following list.

$WITHINCORE_i$: Measures diversification within core business, i.e., dairy products, oils and fats, alcoholic drinks. It is the actual number of four-digit sectors in which the firm is active within the food and beverage industry. Indicates related diversification.
$AGRIC_i$: Actual number of agricultural sectors in which the firm is active (UN-SIC Codes: 1110, 1210, 1300, 1301, 1302) (agriculture, horticulture, animal husbandry, viticulture, pisciculture, aviculture, silviculture, fisheries, and production of seeds). Indicates vertical relatedness.
$RETAIL_i$: Actual number of retail sectors in which the firm is active (UN-SIC Codes: 6210, 6220, 6300, 6310) (retailing, supermarkets, hypermarkets, restaurants, and pubs). Indicates vertical relatedness.
$TECHN_i$: Actual number of technology-related sectors in which the firm operates independent affiliates (UN-SIC Codes: 311280, 832020, 832021, 832030, 9320, 9330) (technological services to other companies, biotechnology, veterinarian services to farms, production of microbiological products, and research centers with the status of independent affiliates). Indicates vertical relatedness.
$OTHER_i$: Number of nonfood industries and services in which the firm is active, excluding of course vertical-related industries. Indicates nonrelated diversification.
$FOODSA_{it}$: Food sales/total sales ratio of the company. Approximates the economic weight of related activities.

M_{it} is the measure of geographical diversification and is captured by the variables presented in the following list.

$FDIV_{it}$: Foreign affiliates/total number of affiliates. Gives a measure of the importance of geographical diversification within the multinational group.

$FCOU_{it}$: Number of foreign countries in which the firm is present. Country spread. Gives a measure of the geographical dispersion of the activities.

$FAFC_{it}$: Number of foreign affiliates/number of foreign countries in which the firm is active. It approximates the complexity of foreign networks in the company.

γ and δ are, respectively, the coefficients of the diversification measures. $u_{it} = \mu_i + \varepsilon_{it}$, where μ_i is the unobservable individual specific effect and ε_{it} is the remainder disturbance. Moreover μ_i is time invariant and accounts for any individual specific effect that is not included in the regression. The estimation method is displayed in the Appendix.

The study period, as shown, includes two subperiods: one of quick expansion, the other of steady expansion.[11] The time variable is obviously a major environmental determinant of growth on *all* FBMs over the study period. However, we do not aim to determine all the determinants of growth for this multinational sector. Rather, we try to understand the effect of diversification on the expansion of a company. We select control variables that could affect the relationship between diversification and growth at the company level, such as the debt burden of a firm. We do not include control variables that affect all companies in our sample similarly, such as time dummies.[12]

Results

To test the impact of each type of diversification on firm growth, we display the results of the econometric analysis in three different sections. Tables 2.6 and 2.7 present the results related to geographical and industrial diversification, respectively. Table 2.8 contains the results on the impact of both types of diversification on firm growth. In general, control variables, such as firm size, influence firm growth negatively, while the capital intensity has a positive impact (see "EQ1"

TABLE 2.8. Results on the impact of geographical and industrial diversification on firm growth.

	EQ1	EQ2	EQ3
σ_ε	0.22429	0.22429	0.22967
Breusch–Pagan	1528.04	1203.59	1185.00
Prob > chi[d]	0.000	0.000	0.000
No. of observations	736	736	736

Note: Standard errors in parenthesis; dependent variable: $GROWTH_{it}$; method of estimation: unbalanced random effects estimator (corrected for heteroscedasticity).

[a] Significant at 1 percent.
[b] Significant at 5 percent.
[c] Significant at 10 percent.
[d] Refers to the probability of accepting the H_0:$\sigma_\mu = \varnothing$.

column in Table 2.6). The leverage ratio is insignificant in all specifications.

Growth and Geographical Diversification

All the measures of geographical diversification except the average number of affiliates by country ($FAFC_{it}$), which captures the degree of integration within foreign countries, are statistically significant when used alone (Table 2.6). Country spread ($FCOU_{it}$) has a positive impact on growth, though the coefficient of $FCOU_{it}$ is very small. Operations in a great number of countries probably make the firm less vulnerable to country-specific factors and risks. Capturing the increased complexity of FBM networks, the ratio of foreign affiliates to total affiliates ($FDIV_{it}$) has a negative, though limited, impact on the rate of growth, given that the coefficient is small. Finally, as can be seen from column "EQ5" in Table 2.6, when we use the number of foreign countries as an explanatory variable, it absorbs all the significance of the other two measures of geographic diversification, while the sign of $FDIV_{it}$ remains negative, but the variable is insignificant.

Growth and Industrial Diversification

Table 2.7 reports the impact on growth of various types of industrial diversification.

The results support the theoretical framework we used before. Related diversification seems to positively affect the growth of a firm. The coefficient of $FOODSA_{it}$ is positive and statistically significant in all cases (some of the combinations are not displayed here). The positive sign of $WITHINCORE_i$ in column "EQ2" of Table 2.7 further supports this result, though it lacks statistical significance. Nonrelated diversification, on the other hand, measured by $OTHER_i$, increases network complexity and uncertainty, as the firm enters new markets where it has no experience or advantages. This likely leads to lower rates of growth. Furthermore, diversification into technologically related activities ($TECHN_i$) leads to increasing growth rates. This result could seem surprising. While the rationale of the international expansion of multinationals lies in the deployment of proprietary assets, the most important of which is knowledge (Caves, 1996), many highly profitable FBMs are hardly innovative (Christensen, Rama, and von Tunzelmann, 1996). Moreover, rates of R&D to sales are comparatively low, even among the largest companies in this industry (Grunert et al., 1995). Finally, other aspects of vertical integration in the firm's value chain, such as retail and agricultural operations, have no impact or even a negative impact on the growth of the firm.

Growth and Both Types of Diversification

Finally, we will assess the impact on growth of both geographic and industrial diversification. Table 2.8 presents the results for growth, controlling for both types of diversification. Our previous conclusions remain unchanged, which shows that our statistical results are robust. Yet the introduction of country spread ($FCOU_{it}$), much more important for inducing growth, makes the weight of core businesses ($FOODSA_{it}$) irrelevant. By contrast, $FOODSA_{it}$ counterbalances the negative influence on growth of the two other variables measuring geographic diversification, i.e., $FDIV_{it}$ and $FAFC_{it}$. The correlation coefficient for our measures of industrial or geographical diversification shows that these two measures of diversification are

not correlated. Furthermore, we tested this model with country dummies, but again the results remained unchanged.

Though the independent variables explain around 50 percent of the variability of the rate of growth in FBMs and the Wald test shows that the regression equations are statistically significant, our analysis should be viewed as a study of the effects of diversification on growth when other determinants are controlled for, rather than as an attempt to model growth in FBMs.

We also tested the model with profitability as the dependent variable. Though firms tended to enjoy similar profit margins (5.0 to 4.6 percent) over 1985-1994, their profits on assets fell from 8.4 to 6.4 percent. Their profits on equity also dropped, from 16.3 to 12.7 percent. The results of the econometric analysis were poor. The cause could be our use of after-tax profit data, the only data available, since differences in tax systems are likely to distort results. Most international comparisons use gross profit data instead.

CONCLUDING REMARKS

With some exceptions, the world's 100 largest food and beverage multinationals grew more slowly (and became less profitable) by the late 1990s.

Over different phases of the business cycle, firms that grew faster tended to be relatively small and capital-intensive multinationals that had avoided diversification into retailing and into noncore businesses, i.e., nonfood products (after allowing for leverage). They may or may not have entered a large number of food and drink industries since related diversification practically did not affect growth. By contrast, they had spread into food-related technological activities, such as biotechnology, specialized services, and microbiological products. They tended to operate in a great number of countries, yet their share of foreign to total affiliates remained relatively low. When they did have a strong international projection and complex involvement at the host-country level, they rather opted for concentration in their core business, keeping a substantial share of food in their total sales.

FBMs coming from different home countries differ regarding diversification strategies, both geographic and industrial. To some extent, such strategies and national traits of the companies explain why some national groups perform faster than others. For instance Japa-

nese multinationals, the fastest growers in the top group, are small, scarcely diversified into nonfood, and involved instead in technological activities related to agricultural and food production. However, country dummies are not good predictors of growth. In fact, correspondences should not be pushed too far. For instance, Japanese firms—as we said, quick growers—often diversify into agricultural activities, which are not especially conducive to fast growth.

Although we use different measures, our results coincide with those of Markides and Williamson (1994) and Fan and Lang (2000) in that we also reject the hypothesis that relatedness always facilitates good performance. Our results also show, as do Fan and Lang's, that some types of vertical relatedness are associated with poor performance. Our findings also support Frankho's (1989) point of view in that R&D activity is a very important predictor of corporate growth in food and beverage multinationals. Our research shows, as did Tallman and Li (1996), that country scope is positively related to performance (their control variables are similar to ours).

In spite of the unique traits of FBMs, many factors of expansion are quite similar in such firms and other multinationals. A relatively small size, reduced unrelated diversification, and substantial involvement in high-tech activities contribute to fast growth among FBMs and other multinationals (Cantwell and Sanna-Randaccio, 1993; Geringer, Beamish, and daCosta, 1989; Siddarthan and Lall, 1982). Our finding concerning high-tech activities in FBMs, surprising given the relatively low R&D/sales level in this industry, imply that diversification into such activities could also positively influence the expansion of multinationals in other traditional industries.

Researchers who analyzed other multinationals did not appear to agree on the effect on performance of geographical diversification. What seems to matter among FBMs is country spread. Over the study period, the FBM actually multiplied its geographic markets. At the same time, it checked the development of networks in host countries and maintained the same relative emphasis of foreign versus domestic activities. We interpret that firms won a great many markets in order to limit the expansion of their rivals without deepening their own involvement in each host country. This strategy was reflected in the specific route to expansion of FBMs, which is built on the presence of the firm in a multiplicity of foreign markets. Country spread influences it positively, and FBMs entering many geographic markets ex-

pand quickly. This result confirms that market proximity is crucial for this type of multinational because they need to interact closely with a variety of national consumers and are not likely to serve foreign markets through exports (Pearce, 1993). In addition, the small initial investment of some FBMs in "new" markets, such as China (Rama, 1992), suggests that the pioneer foreign company has often been able to deter entry with a limited presence, while acquiring knowledge of the new market and creating conditions for growth at the local level. By contrast, a substantial emphasis on foreign versus domestic activities (as measured by the foreign affiliates/total affiliates ratio) negatively influences the growth of the FBMs because such structure probably multiplies the cost of organization.

Related industrial diversification, as measured by number of related businesses, makes a modest contribution to growth both in other multinationals (Pearce, 1993) and in FBMs. However, a large F&B sales/total sales ratio is likely to induce development in the latter. In spite of the beneficial effects of concentration in core businesses, few FBMs intensified such a strategy from 1985-1989 to 1990-1996. Although sales of nonfood products, as a proportion of total sales in the top group, fell from 25.7 percent over 1981-1988 to only 10.2 percent over 1990-1996, changes chiefly took place during the early 1980s. Reducing their noncore involvement over the 1990s, Japanese FBMs are an exception. This strategy could be one of the keys to understanding their dynamism, even through low phases of the business cycle.

In other cases, our findings on FBMs could suggest future changes in other multinationals' diversification strategies. FBMs that diversified into agriculture or retailing were not especially fast performers over the study period, though vertical diversification had played its role in the past (Dunning, 1993; Rama, 1998). Our results imply that the internalized markets of multinationals could lose importance with time, as external markets for goods and services work better. Although diversification into agriculture and retailing are rarely important for other multinationals, our results suggest that other internalized markets for inputs and services could have only a transitory effect on the route to growth of companies.

Other inquiries remain for future research, such as exploring finely grained diversification, testing the curvilinear relationship between related innovation and growth (our model has tested only linear rela-

tionships), and studying the interaction of industrial and geographic diversification in FBMs. Qualitative aspects, not investigated here, also seem important.

APPENDIX

Characteristics of the Sample

In 75 percent of cases, the series of data are complete for the twelve years between 1985 and 1996. In another 16 percent, data for 1985-1996 are available but information for one to three intermediate years is missing. Thus 91 percent of the sample consists of FBMs that were in the top group over 1985-1996. By contrast, nine FBMs joined them between 1987 and 1990 (and were still in the top group in 1996). Their series of data cover a shorter span than those of the other ninety-one; the smallest is a seven-year series (one company). Newcomers are mostly companies from "new" source countries for FDI in this industry, such as Germany and Norway. Conversely, a few companies appearing in the top group by the mid-1980s were not included in our sample because, having dropped out *before* 1990, their series of data had fewer than seven years. Leaving the top group does not necessarily mean the death of the company. Some that are still in business were in the top group only temporarily by the mid-1980s. Most of the multinationals that left the top group, however, were U.S. multinationals acquired by financial groups or other companies in the 1980s. Finally, in a few cases, we were unable to find out why the enterprise dropped out, though we traced company names to make sure that the FBM was not active under a different name. No attempt has yet been made to investigate newcomers, incumbents, or companies that dropped out over diversification strategies.

Difference of Means Test

Table A2.1 uses a difference of means test to check whether the country spread of FBMs, classified by their home country, varied between 1985-1989 and 1990-1996.

Estimation Method

Random versus Fixed Effects

It is a commonly addressed question in panel data whether one should treat the individual effects (μ_i) as specific or random. In this study we

TABLE A2.1. Differences in means for number of foreign countries, by home country of the FBM.

	Number of foreign countries				
	1985-1989		1990-1996		
Home country	Mean	SD	Mean	SD	T-stat
United States	17	13	23	20	3.04[a]
Europe of which:	16	15	20	18	2.43[a]
United Kingdom	10	9	13	11	1.99[b]
France	18	11	24	11	2.23[a]
Rest of Europe	23	20	25	23	0.58
Japan	6	5	9	6	4.12[a]
Rest of world	15	11	16	13	0.37
Total	13	13	18	17	5.23[a]

[a]Significant at 1 percent.
[b]Significant at 5 percent.

will treat the effects as random for three main reasons. The first comes from the nature of the sample, which contains data on the world's 100 largest FBMs. Thus *N* (number of observations) is large enough to lead to an important loss of degrees of freedom. Moreover there is no clear explanation, since all the included firms share almost the same characteristics, why one should treat the effects as individual specific. Though this argument is quite convincing, it is not enough to support the use of random rather than fixed effects.

The second argument comes out of the nature of this study. The main purpose is to explore possible linkages between diversification and growth. What matters most is to estimate the model with some measures of diversification. We measure industrial diversification with two types of measure. One is time variant ($FOODSA_{it}$) and the other, due to AGRODATA limitations, is individual specific but time invariant. This is not a serious problem since the product portfolios of firms are usually stable over the long run (Dosi, Teece, and Winter, 1992). Moreover, since our time-variant variable, i.e., food sales/total sales, remained stable throughout the period, there are reasons to believe that the product portfolio also did. By attempting to estimate our model using fixed effects, we cannot use measures of industrial di-

versification because these will be collinear with the individual effects. On the other hand, estimating our model by random effects enables us to include the measures of industrial diversification. Finally, we are interested in these firms not in themselves individually but as random draws from a larger population of FBMs, even though the sample is censored because of being limited to the top 100. Therefore we decided to treat μ_i as random. In every case the reported Breusch-Pagan LM test (Breusch and Pagan, 1980) supports our decision. Our three measures of geographic diversification, the dependent variable, and the control variables are time variant.

Unbalanced Panel Estimation

Although we tried to use the most complete dataset, some observations are still missing. The variance-covariance matrix must take into account the fact that t (time periods) are not the same for each individual unit (firm). The solution to this problem is quite easy. We must compute θ_i, the weight that random effects uses to transform the dependent variable, and allow for different time periods for each each observational unit.

Heteroscedasticity

The standard error component model assumes that the regression disturbances are homoscedastic with the same variance across time and individuals. This is a quite restrictive assumption, especially in a panel such as the one examined in this study. We already have a certain type of heteroscedasticity since we allowed the group size to vary. To correct for heteroscedasticity due to different groups we also allowed the disturbance variance of the group-specific effect component μ_i to vary across groups. Therefore θ_i becomes the following:[13]

$$\theta_i = 1 - \frac{\sigma_\varepsilon}{\sqrt{T_i \sigma_{\mu i}^2 + \sigma_\varepsilon^2}} \tag{2.7}$$

NOTES

1. As Germany accounted for 15.3 percent of the world's largest multinationals and 25.6 percent of FDI outward stock in 1997 (Ietto-Gillies, 2002), the small number of German firms among top FBMs is noteworthy.

2. Global industries are those in which affiliates are able to establish an international division of labor within the multinational (Porter, 1986). In such industries, affiliates specialize in a small range of products or in parts used in further processing by affiliates located in other countries. In multidomestic industries, by contrast, firms are unable to organize such networks, and competition with other companies takes place in a variety of domestic markets. Semiconductors and automobiles are

examples of global industries while F&B is often cited as a multidomestic industry (Cantwell and Sanna-Randaccio, 1993; Porter, 1986).

3. The foreign sales/total sales ratio is not available for all the sample; thus we opted for the foreign affiliates/total affiliates ratio.

4. In general, the pattern in FBMs is quite similar, by home country, to that found by Ietto-Gillies (2002) in a sample of 664 large multinationals in manufacturing and mining analyzed in 1997.

5. The FBMs average ratio of foreign to total affiliates (54 percent) is similar, for 1990-1996, to that observed by Ietto-Gillies (2002) in multinationals from all sectors (53 percent) for 1997.

6. AGRODATA offers annual exchange rates of different currencies against the dollar, which were used to convert the financial data in current US$. Taking means over time is like taking the average exchange rate of each period.

7. Growth of variable V is calculated as:

$$GR = \left[\left(\frac{V_t}{V_{t-1}}\right)\times 100\right] - 100$$

8. Among the three variables considered in Table 2.5, the rate of growth of employment is, in general, the least dynamic, a situation suggesting that FBMs are becoming more capital intensive. This interpretation would agree with that of Christensen, Rama, and von Tunzelmann (1996) who analyzed a similar sample of companies from 1977-1981 to 1986-1989.

9. However, both the variables considered and the research purposes here are different from those in the Cantwell and Sanna-Randaccio (1993) paper.

10. Growth of sales ($GROWTH_{it}$) was calculated by subtracting the logarithm of the value of sales for period t-1 and firm i from the equivalent for the period t and firm i. The result is the logarithm of proportional growth plus one.

11. Though this question goes beyond the scope of our chapter, one reason for fast growth in the 1980s could be that investors perceived the F&B industry to be a stable, countercyclical industry (Rama, 1992), less subject to turbulence than the, by then, emerging high-tech industries. In fact, the F&B industry of the United States and the European Union performed better than other industries over the 1980s. Good performance attracted many institutional investors, such as pension funds, and increased temporarily the resources available to large F&B firms (Christensen, Rama, and von Tunzelmann, 1996). Together with a demand shift toward high value-added foodstuffs and a wave of M&A (see Chapter 1), this situation could have transitorily stimulated fast growth in FBMs over the 1980s. According to (Rastoin et al., 1998), in the 1990s, the restructuring concluded, FBMs resumed their previous, slower rhythm of growth. In the 1990s, the average multinational grew more dynamically (12 percent over 1990-1994) (Ietto-Gillies, 2002) than the FBMs (only 7 percent in 1990-1996).

12. Other studies aiming at isolating the effect of diversification on performance, not at estimating determinants of growth, also follow a selective research strategy concerning control variables (Markides, 1995).

13. We need to estimate $\sigma^2_{mi} = s^2_i - s^2$ where s^2 is the residual variance of the consistent estimator σ^2_i of the least-squares dummy variable (LSDV) model and

$$s_i^2 = \frac{\sum_{t=1}^{T}(e_{it} - \bar{e}_i)}{T_i - 1}$$

where e_{it} are the residuals of the OLS estimators. Furthermore, to avoid negative values of σ_{μ}^2 we used a methodology proposed by Baltagi (1995) and replaced negative values with zeros.

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