Intra-firm trade and European integration: evidences from the French multinational agribusiness

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Echanges intra-firme et Intégration européenne : le cas des firmes multinationales de l'agroalimentaire français

Résumé

L'objectif du papier est de mettre en évidence les facteurs qui déterminent les choix d'internalisation des échanges internationaux par les FMN et d'analyser en quoi la mise en place du marché européen différencie les stratégies des acteurs. Ce travail s'appuie sur l'enquête "Mondialisation industrielle" réalisée par les Instituts statistiques français en 1993 et en 1999. Pour le commerce extérieur agro-alimentaire français, on montre un développement des échanges intra-firme au sein de l'espace européen dont les déterminants essentiels restent la recherche d'économies d'échelle techniques et organisationnelles et la protection/valorisation des avantages spécifiques des firmes tel que la technologie. Par ailleurs, même si l'on met en évidence le développement de réseaux régionaux européens, on montre également la persistance d'effets frontières entre les pays

Mots-clé : Echanges intra-firmes, Industrie Agro-alimentaire, Marché unique, Firmes multinationales

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Abstract

This paper aims firstly to determine the factors that lead multinational firms to internalise their international exchanges and secondly to analyse the impact of the implementation of the European Single Market on their strategies. This study is based on the "Industrial Globalisation" survey conducted by the French statistics institutes in 1993 and in 1999. With regard to French agro-food trade, the results show that there has been an increase in intra-firm trade within the EU borders and the European MNEs' networks. The main determinants of intra-firm trade are the firms' need to generate economies of scale and to protect and exploit their "firm-specific advantages" related to the technology and to the nature of the product. The model not only reveals the groups' strategy to penetrate the EU markets and to bypass borders, but it also sheds light on the role and the development of intra regional networks of subsidiaries.

Keywords: Intra-firm trade, Agro-food industry, Single market, Multinational firms

JEL: F10 - F14 - F23

1. Introduction

As a result of their foreign direct investments (FDI) multinational firms (MNF) generate internal flows of products, capital, technologies, etc. between their subsidiaries located in different countries. This development of intra-firm international trade is a fundamental phenomenon of the globalisation of economies. Thus, the role of firms, their micro-economic characteristics and specific advantages as a source of competitive advantages for the nations are put in the forefront. This question is addressed in the new international trade theories that recognise the importance of the firm and go beyond the classic Ricardian notion of competitiveness that is exclusively based on the concept of comparative advantages between countries.

The purpose of this article is to highlight the determinants of intra-firm trade. From a theoretical point of view, this study is based on the analysis of the interaction between the micro-economic characteristics of firms and those of their environment, this interaction determining multinational firms' decision to internalise trade (Dunning 2000; Markusen 1995). In this respect, one of the major changes in the environment of French firms has been the implementation of the European Single Market which was meant, among other things, to boost competitiveness by promoting the development of large European firms. During debates concerning the implementation of the Single Market, two questions were raised: Wasn't this single market going to lead to the creation of a "Fortress Europe" by causing trade diversion for third countries? And to what extent should these large firms reinforce the process of European integration? Thus, at the core of the debate were two issues: Flows of goods and multinational firms. The originality of our study lies in the fact that it analyses the determinants of intra-firm trade in the context of the implementation of the Single Market, and it reveals, through the study of these intra-firm flows, an aspect of the processes of European integration. Thus, beyond highlighting the main determinants that promote the internalisation of trade, we aim to analyse if the implementation of the European Market - which implies the abolition of trade barriers, capital mobility within the European Union and protection from the rest of the world – has led the firms to adopt different strategies according to whether they operate within Europe or not. More precisely, we wish to establish whether the determinants of intra-firm trade are the same when the transactions occur with European countries and when they occur with non-European countries.

For this purpose, we have used original data (still rare in Europe) collected during the "Industrial Globalisation" survey on the industrial and commercial firms of the French productive system, conducted in 1993 and in 1999 by the French Statistics Institutes. This survey aimed to identify and quantify these intra-firm exchanges between the French subsidiaries of multinational firms and their sister companies located in other countries. Comparing the results for both years has enabled us to place our analysis in the context of the implementation of the European Single Market.

Thus, this article is structured as follows. In the second section we review the theoretical and empirical literature that aims to identify the determinants and factors that explain the internalisation of trade. The third section presents a first descriptive analysis of the actors and of the characteristics of French foreign trade in agro-food commodities since the implementation of the Single Market in 1993. These first two stages enable us to build the model's specifications presented in the fourth section as well as the results related to international trade in French agribusiness.

2. The determinants of intra-firm trade

By definition, a multinational firm controls a number of subsidiaries located in different countries. This enables the firm not only to increase its production capacity, but also to penetrate other foreign markets. Moreover, the productive organisation of a multinational firm gives the firm the capacity to internalise part of its exchanges with foreign countries within an internal market whose functioning and driving forces we know little about. The question raised in this article is then to understand why a multinational firm internalises part of its exchanges with its subsidiaries located abroad, at the detriment of direct exchanges.

Two different theoretical approaches have focused on this specific notion of *internalisation*. The first, based on the theory of transaction costs and led by O.E. Williamson (1975), proposes an interpretation of internalisation as a response to market imperfections. The second paradigm developed by Dunning (1988, 2000) proposes a more "eclectic" approach to multi-nationalisation, organised around three necessary conditions for the firm's internationalisation: "*Ownership specific advantages, location, internalisation*". In this context, several authors have analysed this question, taking into account the increasing importance of innovation processes and knowledge creation in economic systems, basing themselves on a notion of the firm as an entity in which resources are created, and focusing more on the types of advantages possessed by the multinational firms than on the traditional market barriers. Thus, beyond the conventional explanations proposed for market internalisation, a new approach has emerged in which the existence and dynamics of firm-specific competitive advantages play a central role. Thus, following authors like Dunning (2000) or Markusen (1995), the literature on the motives for internalisation can be divided according to two main sets of interrelated determinants: those related to the micro-economic characteristics of the firm, as a reflection of its specific advantages, and those related to the characteristics of its location's environment. The articulation of both sets determine multinational firms' decisions concerning international trade (Head 2004, Markusen and Venables 1998) and conditions their decisions to internalise their exchanges with foreign countries or, in other words, to create an internal market.

2.1. The internal characteristics of firms

Each firm has its own specific characteristics that influence its behaviour and performance on foreign markets. The internalisation of trade, which is strongly related to the organisational structure of the MNF, enables the latter to protect and exploit its internal characteristics and specific advantages such as those related to products or organisational competencies.

More precisely, *the organisational structure* of the multinational firm, not only conditions the existence of intra firm exchanges, but also their nature and intensity. Following Markusen's article (1995), recent works in international economics have modelled the organisation of multinational firms (Head, 2004; Markusen and Venables, 2000; Grossman, Helpman and Szeidl, 2006…). They highlight the existence of a variety of forms that are determined by the combination of different elements such as comparative advantages, the level of trade costs, the level of scale economies or the market size. The differences in factor endowments between countries can for example, explain a firm's choice of location and more particularly the so-called "vertical" integration form and the fragmentation of production within the networks of MNEs. Inversely, Markusen and Venables (1998) show that for given and convergent levels of both absolute and relative endowments, horizontal integration exists when the ratio of two plants to one plant's fixed costs is relatively low and trade costs are relatively high. Consequently, the motives for intra-firm trade and more precisely the nature of the product exchanged are thought to differ according to the organisational form of the firm. According to Anderson and Fredriksson (2000), intra-firm trade in intermediate goods translates a vertical productive organisation at international level, whereas exchanges of final products correspond to a horizontal integration of the multinational firm (most of the subsidiary's production is sold directly in the foreign country). Egger and Pfaffermayr (2005) show that in the case of Austrian manufacturing industries, the fragmentation of production within the network of MNES leads to a multiple border crossing of intermediate goods through the internal market notably. Head (2004) shows, for instance, that in parallel with vertical integration that generates intra-firm trade, horizontal integration leads each subsidiary to produce certain varieties of products for the local market and for export, and to import other varieties produced by other subsidiaries. These internal exchanges of finished goods are all the more important as they necessitate a phase of adaptation to the local market and an after-sale service.

Apart from the nature of the products (intermediate or final products) which reflects the productive organisation of the multinational firm, other properties of the product influence the decision to internalise trade. As mentioned above, one of the motives for intra firm trade is the *protection by the firm of its specific assets*, such as, for instance the protection of key ingredients used to produce the commodity. Additionally, according to several authors, *the differentiation and creation* *of new products*, and more generally, the product's technological level are central in explaining the internalisation of exchanges (Wang and Connor (1996), Siddarthan and Kumar (1990), Benvignati (1990), Markusen 1995). Indeed, it is believed that these products are rather complex and new for consumers and the costs related to their marketing are high (marketing promotion, need for consumer information, of an after-sale service…). These characteristics imply the existence of a substantial Research and Development activity. Because of the greater complexity of the products and of the necessity to protect technological knowledge, the intensity of Research and Development is an argument in favour of intra-firm trade (Markusen 1995, Teece 1985, Rama 1999). In this context, the *intensity of the human capital* is often used to evaluate the extent of the knowledge that must be protected and *research and development expenditures* are used to determine the nature of the innovation intended for the products. *Advertising expenditures* can also give an indication of the effect of product differentiation on intra-firm trade. It may be seen as a tool that efficiently measures the «differentiation of enterprises» that use their image to promote their products for export (Wang and Connor, 1996).

Concerning the organisationnal competencies, the search for *economies of scale* is believed to be a factor influencing the development of intra-firm trade. Markusen (1995) distinguishes the scale economies obtained at the level of the group as a whole from the economies of scale generated at the level of the subsidiary. According to this author, the first type of *scale economies, that are related to the subsidiary,* refers to the existence of increasing returns and of productivity gains related to the size of the firm. As mentioned above, it explains the location of a factory in the given country by the necessity to achieve returns on equipment investments and to manufacture a product that corresponds to the demand of the host country. In its extreme form (« the polymorphic form" according to Head, 2004), the multinational firm could open two similar production units in the two countries where it wants to position itself. This enables the firm to be closer to the demand by reducing transport costs and adapting the product to consumers' preferences while making the most of the scale economies, without any trade taking place between the two subsidiaries. However, this would be ignoring the economies of scope and the fact that the production units can specialise in different varieties or products. By exploiting the distribution networks of both units, intra firm exchange can take place, while enabling the multinational firm to widen the range of products it offers.
The second type of scale economies is, according to Markusen, more particularly conducive to intra firm transactions, as it enables the firm to valorise research and development activities, for example. It refers to the economies of scope highlighted by Chandler (1990) that can be accounted for through the international experience acquired by the multi-national Firm.

Thus, as shown by Siddarthan and Kumar (1990), if a group already has subsidiaries in a country, its exchanges with this country will be internal to the group, so as to minimise the costs related to market information and to the creation of a new infrastructure to distribute the products. Authors, such as Wang and Connor evaluate this experience using the percentage of sales made abroad by the subsidiaries, out of the total sales of the group. In a similar vein, Lall (1978) uses the share of the assets of the foreign firm out of its total assets. They show that this has a positive effect on the internal market.

2.2. The firms' meso and macro economic environments

The characteristics of the environment in which the firm operates (location of the subsidiaries but also the markets in which exchanges take place) are also underlined in the literature as a factor of internalisation. In this regard, two main types of interdependent factors are highlighted to explain internalisation, which is considered as a way for a firm to (i) Exploit the variety of meso and macro economic environments in order to make the most of its own specific advantages and (ii) Bypass or even exploit the different trade barriers to market access.

- *The exploitation by the firm of the meso or macro economic environments*.

As noted above, the differences in factor endowments between countries can be a factor explaining a firm's choice of location and may condition the nature of the products exchanges. Moreover, firm-specific advantages are constructed in the sectoral dynamics of the countries in which they are located. The question is then to know in what way the macro economic conditions and the sectoral structures have an impact on the decision to develop intra-firm trade[1]. *The comparative advantage of a country in a given sector* can act as a public good for all firms of the sector the decision to internalise trade being influenced by the spillovers generated by the sectoral dynamics at national level. Thus, for example, a strong national comparative advantage for one product allows for a good knowledge of this product by foreign consumers thanks to the existence of a generic image on which the firm can rely, and the existence of well established networks of commercialisation. In this context, using the internal market can be less necessary for the firm. On the contrary, in the case of sectors penalised by collective disadvantages, the firms must mobilise their own individual performances or specific advantages in order to be able to export (Abd-El-Rahman 1987). In this case, using their internal markets can enable the multinational firms to improve their performance. Abd-El-Rahman highlighted this articulation between the countries' comparative advantages and firm-specific advantages to explain the existence of intra-industry trade between countries. More specifically, here, we propose the hypothesis that it is also one of the deciding factors for intra-firm trade.

- Intra Firm trade : a mean to bypass or even exploit trade barriers

In terms of trade barriers, internalisation can be considered as a way to bypass but also to create market imperfections (Buckley and Casson 1998). It is considered as a way for firms to protect their monopolistic advantage, or even to create barriers to market access (Hymer 1960, Becuwe et al. 2002). Internalisation provides the means to practise different competitive strategies against competitors (predatory pricing, price discrimination…). Furthermore, in a context of uncertainty, the presence of trade barriers justifies the existence of intra-firm trade (Becuwe et al. 2002). As a result, many authors have attached great importance to the analysis of market structures (degree of concentration, size of the firms….) and have introduced the level of concentration of the sector-based activity to account for this factor (Connor 1983, Sugden 1983, Wang and Connor 1996).

Trade barriers can be due not only to specific market structures but also to all the other trade costs as defined by Anderson (2003), i.e the tariff and regulatory conditions (norms), and the cultural (the consumer preferences) or geographic conditions (transport costs). Because they all lead to market segmentation, they can generate an increase in foreign direct investments, which in turn helps limit the impact of these barriers and enables the firms to get closer to the demand. However, the impact of this strategy on intra-firm trade is unclear. In this respect, the motives for this foreign direct investment will condition the existence of an intra-firm exchange. If foreign direct investment is chosen as a way of bypassing trade barriers (tariff-based or not), this "bridgehead investment" (as called by Greenaway, 1993)[2] will replace exchanges and there will theoretically be little or no intra-firm trade between the parent company and the subsidiary.) If foreign direct investment is chosen as a means of adapting to the conditions of the local demand and to the local distribution networks and consequently of bypassing cultural barriers, it will enable the other subsidiaries of the group to save on informational learning and the impact on intra-firm trade will be positive. Conversely, when markets are more integrated, as in the case of the European Single Market, the reduction of trade barriers enables the multinational firms located on this integrated market to better coordinate the activities of their different subsidiaries while benefiting from the reduction of trade costs. By creating specialised subsidiaries, the multinational group can serve a larger market and promote intra-firm trade (Dunning and Robson 1987; Millington and Bayliss 1996). In this respect, a reduction of trade barriers will stimulate intra-firm exchanges.

[1] Another source of macro economic heterogeneity that can be a determinant of internalisation is that resulting from the differences between the national fiscal systems. Intra-firm exchange can be favoured in order to obtain an overall reduction of tax expenses in a context where taxation systems are heterogeneous (Konrad and Lommerud 2001) or in order to limit the impact of taxes on the firms' competitiveness (Chevassus-Lozza et al 1999).

[2] K. Head and T. Mayer (2002) propose the notion of "border effect jumping" to qualify this strategy adopted by certain firms from non-EU countries in order to facilitate their access to the European market.

To conclude, the question may be asked of the expected impact of the European integration on Intra-Firm Trade. It appears, from the above discussion, that it can have two main effects on IFT. For the firms located outside the EU market, the trade barriers at the entrance of the market can limit intra firm exchanges between the European subsidiary and its sister companies located in the rest of the world, if the motive for FDI is to bypass the barriers. For the firms located within the EU market, the free circulation of goods which the lifting of trade barriers has allowed, should lead to the progressive disappearance of IFT and an increase in direct exchanges. However, as shown in literature, other elements explain intra-firm trade and can counterbalance this result. As noted by Markusen, the Single Market is not just a free trade area, it is also an area of homogeneous economic development that encourages capital mobility. This mobility is favourable to the growth of multinational firms and therefore of intra firm trade. In this context, firms located in Europe, may benefit from an integrated market and can exploit the scale economies generated at the level of the group. Then, the question may be asked of the nature of the goods exchanged in these two configurations (insiders/outsiders). Should we expect exchanges of final goods within the EU and a greater international division of labour with increasing exchanges of intermediate goods between the EU and the rest of the world ? These different questions show that commercial logics are related to organisational logics in MNFs' strategies.

3. Evolutions in the French agro food trade since the implementation of the Single Market

A preliminary statistical description can shed light on the evolution that has occurred in this context since the implementation of the Single market in 1993. Among the several statistical sources mobilised to conduct our analysis, the most important and original is the French "Industrial Globalisation" survey conducted, in 1993 and 1999 by the French Statistic Intitutes (SESSI, SCEES and INSEE). The purpose of this survey was to estimate the proportion of IFT in the total trade of the firms. This file enabled us to distinguish and compare intra firm trade and arm's lenght transactions. This survey makes it possible to distinguish two types of flow (Intra and inter firm) per firm, product and geographic destination or origin of the exchanges. In order to characterise the enterprises and the sectors of the agro-food trade, we have combined this individual data from this survey with other statistical sources:

- The file concerning the exporting and importing enterprises of the Directorate General of French Customs (1993 and 1999). These files have enabled us to identify the exporting and importing firms located in France, the destination and origin of their exchanges per product (in nomenclature nc8 or cpf6), in value and volume.
- The file of the annual surveys of enterprises (EAE survey - INSEE: 1999 and 1993). The results of this annual survey provide individual information about the size of the firms (turnover, number of employees, wages), their location and their accounting structure.
- The survey concerning the financial links between firms (LIFI survey, INSEE: 1999 and 1993) that enabled us to reconstruct the boundaries of the corporate groups and to identify the parent compagny and its nationality.

3.1 A Europeanisation of production and trade in the French agro food sector

The increasing integration of the European markets in the last ten years, due both to the completion of the Single Market and to the implementation of the Economic and Monetary Union, has modified competition conditions between firms. Thus, the removal of barriers to trade and to capital mobility has given foreign firms greater access to European markets. Firms no longer exclusively work on their own national markets but have an increasingly European or even global perspective. This finding by the European Commission (2002) applies to the European industrial sector as a whole, and to the French agro-food industry in particular (Table1). Indeed, European investments in French agribusiness have increased significantly. Thus the number of European firms located in France increased 2.6 fold between 1993 and 1999 (against 1.2 fold for all the firms of the sector). Comparatively, the weight of non-European foreign firms has not much increased. This phenomenon of Europeanisation also materialises in an evolution of French agro food exchanges, in which the role of European firms increased significantly during the 1993-1999 period, at the expense of French firms essentially.

Table 1. An increasing "Europeanisation" of French production and trade of agro food products

	Number of enterprises		*Proportion in agrofood products trade*			
			Exports		*Imports*	
	1993	*1999*	*1993*	*1999*	*1993*	*1999*
Non European Enterprises	*194*	*212*	*14.7%*	*11.5%*	*13.3%*	*12.3%*
French Enterprises	*5989*	*6906*	*79.1%*	*75.9%*	*78.0%*	*63.3%*
European Enterprises	*218*	*579*	*6.2%*	*12.6%*	*8.7%*	*24.4%*
Total	*6401*	*7697*	*100%*	*100%*	*100%*	*100%*

Source: EAE -LIFI- French Customs, 1993 and 1999.
Scope: Concerning the number of enterprises, the agro food and food wholesale firms have been taken into account. As to exchanges, the foodstuff are defined in the French classification of products (cpf3 151 to 160 and all firms exchanging these products are taken into account, whatever their sector of activity (agro food, wholesale or others).

However, as could have been expected, this Europeanisation of the capital of the French agro food sector, does not translate into an intensification of exchanges with the European market. The "Industrial Globalisation" survey shows that the overall proportion of trade conducted with European partners has remained stable since 1993: it still represents 75% of imports and 68% of exports. This phenomenon highlighted for the agricultural and agro food sectors is in fact comparable to that experienced in the other sectors. Indeed, K. Head and T. Mayer (2002) show that third countries had a comparatively more difficult access to the European market at the beginning of the 1980s but that the implementation of the Single market has not been accompanied by an "Fortress Europe" effect.

3.2 The increasing weight of intra-firm trade in the total foreign trade of France

Part of this trade is conducted within the internal market of multinational firms. These intra-firm exchanges represent over 27.1% of French foreign trade in agro food products that is 31% of the total exports and 23% of the total imports. Their weight has been increasing constantly: they accounted for only 23% of the total exports and for 11% of the total imports of agro food products in 1993 (Chevassus-Lozza et al 2004). In this respect the agro food sector seems to have caught up with the other sectors of the French economy.

Intra-firm exchanges often being aimed to facilitate access to foreign markets, their evolution varies significantly according to the nationality of the capital (Table 2). French-owned subsidiaries account for almost two thirds of total intra-firm exports and this share has changed very little since 1993. In the case of imports, however, the French groups only accounted for 19.4% of intra-firm imports in 1999, against approximately 30% in 1993. This translates into an inverse configuration for the foreign-owned groups operating in France, which are more present on the import side than on the export side. They account for 80% of the intra-firm imports of agro-food commodities. Non- European groups use their internal market more and more, often at the expense of their direct exchanges. For these groups, internal trade represented almost 75% of their imports and 67% of their exports in 1999, whereas it accounted for only one third of their exchanges in 1993. Between 1993 and 1999 the weight of these non European groups in the total intra firm imports have increased dramatically, at the expense of French owned groups.

Table 2: Breakdown of the French trade of foodstuffs: by type of exchange and firm nationality

EXPORTS			*IMPORTS*		
	1993	*1999*		*1993*	*1999*
Sales to third parties :	***77%***	***69%***	***Purchases from third parties:***	***89%***	***78%***
Of which :			***Of which :***		
*French owned firms **	*65.4*	*57.3*	*French-owned firms**	*74.8*	*59*
European groups	*2.7*	*7.7*	*European groups*	*4.9*	*15.9*
Non EU groups	*9.0*	*3.8*	*Non EU groups*	*9.3*	*3.1*
Sales to affiliates **:	***23%***	***30.9%***	***Purchases from affiliates** :***	***11%***	***22%***
Of which :			***Of which :***		
French groups	*13,7*	*18.3*	*French groups*	*3,2*	*4.3*
European groups	*3.6*	*4.9*	*European groups*	*3.8*	*8.5*
Non EU groups	*5.7*	*7.7*	*Non EU groups*	*4.0*	*9.2*

Sources : Globalisation survey (SESSI, SCEES, INSEE), French Customs, 1993 and 1999.
* Independent firms and subsidiaries of French groups.
** Intra firm exchanges

In terms of *geographic distribution*, most of these intra-firm exchanges take place with subsidiaries located in the European Union, with varying profiles depending on the nationality of the firm (Table 3).
Thus, the subsidiaries of French groups strongly reinforce the use of their internal markets in their imports from the EU. In this respect they fit the profile of European subsidiaries that are strongly dependent on their European networks and on their mother companies (48% of their intra-firm imports are purchases from their mother company). In terms of exports, on the contrary, exchanges towards the rest of the world remain important especially for French firms but also for the European subsidiaries, despite a strong tendency to re-center their exports towards Europe.

As for the non-European firms located in France, characterized by a high rate of intra-firm trade, most of their internal transactions are done with European countries, and a very small part of their exchanges are done with sister-companies located in other countries. This reveals a bridgehead investment strategy used by foreign groups to bypass European trade barriers – thanks to a network of not only French but also European subsidiaries - and thus penetrate the market. However, the increase, since 1993, of their internal imports from subsidiaries located in other countries, which might be related to the reduction of customs tariffs at the frontiers of Europe, has tended to re-position these non-European firms in the global organization of their group.

Table n°3: Distribution (in %) of intra-firm exchanges according to the nationality of the firm and the geographic destination of the exchanges.

	1993			*1999*		
	Rest of the world	*European Union*	*All zones*	*Rest of the world*	*European Union*	*All zones*
Exports						
French Groups	*30,9*	*69,1*	*100*	*37*	*63.0*	*100*
European Groups	*37,7*	*62,3*	*100*	*23.3*	*76.7*	*100*
Non-European Groups	*15,3*	*84,7*	*100*	*14.9*	*85.1*	*100*
Total	*28,3*	*71,8*	*100*	*29.3*	*70.70*	*100*
Imports						
French Groups	*36,8*	*63,2*	*100*	*4.8*	*95.3*	*100*
European Groups	*8,2*	*91,8*	*100*	*7.1*	*92.9*	*100*
Non-European Groups	*13,4*	*86,7*	*100*	*29.7*	*70.3*	*100*
Total	*18,5*	*81,5*	*100*	*16.1*	*83.9*	*100*

Source : Customs, EAE, LIFI, SESSI Globalisation survey

In short, it appears that although the implementation of the European Market was not followed by a reinforcement of intra-European trade, it has translated, for French agro-food trade, into a Europeanisation of the actors and an increase of intra-firm trade within Europe. Thus, far from reducing multinational groups' internal exchanges, the Single Market seems to facilitate the construction of their own regional networks. In this context, the question that needs to be raised is how internal markets enable firms to exploit their specific advantages, in a Single Market characterised by an increasing convergence of economic structures.

4. The determinants of intra-firm trade in French agribusiness

Our goal, from an empirical point of view, is two-fold: Firstly, we wish to determine the motives that lead multinational firms to trade internally rather than directly on the market; secondly, we wish to highlight, beyond the general model, the diversity of the strategies of internalisation adopted by firms.

More precisely, we seek to determine how firms articulate their specific advantages and the advantages of the location of their subsidiaries in their internalisation process. Concentrating on French foreign trade of agro-food products, we analyse the impact of the Single Market on the modalities of intra-firm trade. Is the process of trade internalisation the same whether the firm exchanges on the European market or not? We then propose the hypothesis that for non-European enterprises the Single Market represents an important barrier to trade, but that when they are located in Europe, they benefit from the reduction of trade barriers, even though some barriers persist at national level and tend to segment the market.

4.1 Methodology: the econometric model and the variables.

Our aim being to determine the motives that lead multinational firms to trade internally rather than directly on the market, we have chosen to use a probit model, with the decision to exchange internally as the explicative variable. The model is estimated at the level of each exchange flow, that is to say, for the triplets (enterprise j, product k, country p). The product is found in the cpf6 nomenclature.
The probit is therefore written as follows:

$$\begin{cases} Intra_{jkp} = 1 \text{ if } \alpha . Z + e \geq 0 \\ Intra_{jkp} = 0 \text{ if not} \end{cases}$$

where Z is the vector of the explicative variables explained in table 4 and Intra = 1 if the exchange is of the type intra-firm exchange, Intra = 0 otherwise.

Table 4: Description of the variables used in the model

Variable	Comment	Measure
Variable characterising the firm and its organisation		
Economies of scale at the firm's level	Positive expected effect on intra-firm exchange	Average size of firm (j) / average size of the top 50% of firm size distribution of the industry This distribution being calculated for all enterprises that have the same main activity as that of (j).
Economies of scale at the group's level.	Degree of intensity of the internal market. Measures the international experience of the group. Positive expected effect on intra-firm exchanges.	Rate of intra-firm exchange of the group to which the firm belongs, calculated as the share of the intra-firm exchanges (X+M) in the group's total exchanges. Ratio calculated for all the group's subsidiaries located in France with the exception of the firm considered (j).
Nationality of the firm		Dummy variable indicating the nationality of the group that controls enterprise (j), nonEU = 1 for non European groups; =0 otherwise , FRENCH = 1 for French groups ;=0 otherwise, EU= 1 for European Groups;=0 otherwise.
Advertising expenses of the subsidiaries	Measures product differentiation. Expected sign, undetermined a priori	Proportion of the turnover dedicated to advertising expenditures
Qualification of the labour force	Importance of the knowhow. Indirectly measures the technological knowledge of the firm. Positive expected effect on intra-firm exchange.	Ratio of the average wage in the firm with the average wage in the sector to which the firm belongs
Nature of the product : Intermediate product/ finished product	Expected sign undetermined a priori	Dummy variable : IP=0 if the good is a finished product, Ip=1 if it is an intermediate product.
Variables characterising the environment of the firm		
Degree of concentration of the market	Measures the intensity of competition for the product considered. Positive expected effect on intra-firm exchanges.	The C4 index is calculated on the basis of turnover of the top 4 enterprises located in France belonging to the same sector of activity (French nomenclature)
Effect of the European market	Positive expected effect	dummy variable zone=1 for the European union, zone=0 for the rest of the world.
Exchange towards the group's mother company		Dummy variable : TG=1 if the exchange occurs in the country of the mother company, TG=0 otherwise
Comparative advantage		At exports : France's market share in the total imports of the partner country, for the product considered. At imports : market share of the partner country in France' total imports, for the product considered.
Sector		Indicators corresponding to the branch of the product exchanged (3-digit French nomenclature)

4.2. The overall determinants of intra-firm exchanges

The results (table 5) highlight the importance of *the firm's characteristics* in the factors that influence the decision to internalise trade. This decision is significantly related to the need to exploit scale economies at the level of the units located in France. It is also positively influenced by the existence of spillovers generated by the experience of the group to which the firm belongs, and more specifically by the importance of its international internal market. These results are in keeping with those obtained by Wang and Connor (1996) or Markusen (1995) who highlighted the important influence of the different types of scale economies - whether at the firm's level or at the group's level - on the decision to use the internal market. These factors are reinforced by the firms' endeavour to enhance their image, which reflects the specificity of the firms and plays in favour of internalisation. As highlighted in literature, the technological level of the products - which is measured by the level of qualification of the labour force - plays a significant role in the internalisation of exchanges. These different factors have a similar influence on both imports and exports. The intensity of the internal market of the group is the only factor that plays negatively on intra-firm imports. This is in keeping with one result highlighted by Zejan (1989) who shows that in the case of Sweden, and more specifically in the case of a highly multinationalised Swedish group characterised by a high rate of internal exchanges, the higher the rate of multilateral exchanges between the subsidiaries, the lower the rate of imports from the parent company. In our case, this puzzling result could also be due to the fact that these imports essentially concern foreign groups. This would tend to indicate the existence of a "bridgehead" effect conducive more to exports towards European markets than to imports towards French subsidiaries of foreign groups[3]. With regard the firm's country of origin, the nationality of the capital tends to indicate that it is the non-European firms that use their internal market the most for both their exports and imports. Finally, the probability of intra firm trade increases when the exchanges take place with the mother company's country. This effect is even more marked for imports than for exports.

The effects of the firm's environment play at different levels. Furthermore, whatever the nationality of the capital, intra-firm trade seems to develop more if the firm targets the European market more than the rest of the world. This effect tends to indicate that, despite the lifting of trade barriers within the EU, a two-fold phenomenon has facilitated the creation of internal flows: incentives to capital mobility and to foreign direct investments - which is a necessary condition for the existence of an internal market - but also the possibility of better exploiting the firm-specific advantages in a more integrated space. Thus, as shown by Dunning and Robson (1987), by reducing transaction costs, the implementation of the Single Market has enabled multinational firms to better coordinate the activities of their subsidiaries within the European market, which is conducive to intra-firm trade.

[3] These results converge with those obtained for the French agro-food sector, based on the "Globalisation" survey conducted in 1993 (Chevassus et al. 1999)

Table 5. The determinants of intra-firm trade. Analysis of import and export flows.

	Exports		Imports	
The firm and its organisation				
Economies of scale :				
At the firm's level	0,019 *(0.001)*	(*)	0,007 *(0.002)*	(*)
At the group's level	0,133 *(0.018)*	(*)	-0,060 *(0.022)*	(*)
Nationality of the firm :				
French groups	*Reference*		*Reference*	
Non European groups	0,218 *(0.016)*	(*)	0,251 *(0.020)*	(*)
European groups	0,110 *(0.015)*	(*)	0,171 *(0.019)*	(*)
Image (Advertising)	0,359 *(0.064)*	(*)	-0,066 *(0.074)*	(ns)
Qualification of the labour force	0,109 *(0.015)*	(*)	0,083 *(0.025)*	(*)
Consumer goods	*Reference*		*Reference*	
Intermediate goods	-0,029 *(0.014)*	(*)	0,002 *(0.016)*	(ns)
The firm's environment				
Degree of concentration of the market	0,060 *(0.027)*	(*)	0,110 *(0.033)*	(*)
Effect of the European market				
(comparatively to the rest of the world)	0,308 *(0.011)*	(*)	0,127 *(0.016)*	(*)
Exchange with the country of the parent company	0,162 *(0.038)*	(*)	0,290 *(0.027)*	(*)
Comparative advantages	-0,173 *(0.021)*	(*)	-0,052 *(0.046)*	(ns)
Sectors : Meat sector	*Reference*		*Reference*	
Sea food	0,130 *(0.040)*	(*)	-0,081 *(0.032)*	(*)
Preparations of fruit and vegetables	0,131 *(0.027)*	(*)	0,030 *(0.029)*	(ns)
Oil products	0,110 *(0.042)*	(*)	-0,125 *(0.026)*	(*)
Dairy products	0,293 *(0.025)*	(*)	0,059 *(0.033)*	(*)
Processed cereals	0,326 *(0.028)*	(*)	0,053 *(0.035)*	(ns)
Animal feeding stuffs	0,438 *(0.027)*	(*)	0,017 *(0.049)*	(ns)
Other food products	0,195 *(0.022)*	(*)	0,071 *(0.028)*	(*)
Beverages	0,273 *(0.022)*	(*)	0,103 *(0.044)*	(*)
Number of observations	10586		4840	
Pseudo R^2	0,1696		0,1104	
Correctly classified value	73.04%		72,58%	

(*) significant at 5%; (**) significant at 10% ns: non significant

The coefficients are the marginal effects of the different variables for the probability of an intra-firm flow (and standard errors in brackets).

At a more sectorial level, the purpose of internalisation is to bypass trade barriers. The intensity of these barriers, measured by the degree of concentration of the markets, plays significantly on intra-firm imports. The probability of intra-firm export is particularly high in sectors such as the dairy industry, cereal processing and animal feeding stuff manufacturing, in comparison with the meat sector which in France is characterised by a high export rate but which exchanges directly on foreign markets (See Sector table in annex 1). This result is due to the nature of the product but also to the degree of internationalisation of the actors. In the meat sector, few firms belong to multinational groups or operate within an international division of labour.

Finally, intra-firm exchanges are also sensitive to sectoral spillovers and exchanging non-perishable or more complex products plays in favour of internalisation. If France possesses a strong comparative advantage in the exports of one product towards one given country, this might reduce the necessity of using the internal market of the firm. Thanks to their dominant position on the agro-food market, France and, therefore, French exporters have developed their own "collective" image and a global network of distribution (Chevassus-Lozza and Galliano 2003). The necessity for multinational firms to individually create their own internal networks might as a result be less fundamental.

Conversely, the smaller France's comparative advantage on a market, the greater the necessity for a firm to mobilise its own specific advantages. Using the internal market then appears to be a solution. This effect also has a negative influence on imports but in a lesser extent (it is not significant). This can be explained by the important number of French-owned firms that import. These subsidiaries do not need the spillovers generated by the specialisations of the partner country to penetrate their own markets.

4.3. The impact of the Single Market on the determinants of Intra Firm Trade: A diversity of internalisation behaviour

The above results as well as the empirical section describing trade have shown that firms are more likely to use their internal market when the transactions occur within Europe. Does this indicate that firms adopt different strategies according to the destination of the transaction? The purpose of this section is to test, beyond the general model, the impact of the exchange zone on the decision to use the group's internal market. Are the motives for intra-firm trade the same according to whether the transaction occurs in European countries or not (Table 6)?

At both export and import levels, the influence of advertising expenditures on the decision to trade within the group differs greatly according to the type of transaction. Their impact is highly positive for imports and exports towards the EU (particularly on exports), and it is negative for all exchanges (exports or imports) with the rest of the world. Thus it appears that advertising expenditures and initiatives to enhance the brand's image play an important role for the multinational groups that use an internal market within Europe, which translates into the constitution of European networks of subsidiaries, combined with the implementation of a collective advertising strategy on a European scale.

A similar result was found in a study carried out by the European Commission (2002), according to which firms have changed their commercial policy on the European market since the implementation of the Economic and Monetary Union, and of the Euro particularly. As they can no longer use price discrimination between member states, some firms develop a pan European marketing, and therefore advertising policy? It must also be noted that the products exchanged internally in European networks are intermediate or finished products of a relatively high technological level necessitating a qualified labour force. On the contrary, on the non-European markets, we observe a type of labour division characterised by intra-firm imports of intermediate goods and exports of final products.

Table 6. The determinants of intra-firm trade according to the geographic zone of the exchange. Is there a differentiated effect of the European Single Market?

	Exports		Imports	
	European Markets	Rest of the world	European Markets	Rest of the world
The firm and its organisation				
Economies of scale :				
At the firm's level	0,018*	0,017*	0,005*	0,009 *
At the group's level	0,170*	0,084*	-0,069*	-0,041ns
The firm's nationality :				
French groups	*Reference*	*Reference*	*Reference*	*Reference*
Non European groups	0,182*	0,225*	0,262*	0,048ns
European groups	0,087*	0,097*	0,186*	0,110ns
Image (advertising)	0,986*	-0,442*	-0,008 ns	-0,163ns
Qualification of the labour force	0,182 *	0,025 ns	0,096 *	0,035ns
Consumer goods	*Reference*	*Reference*	*Reference*	*Reference*
Intermediate products	-0,037 **	-0,045 **	-0,029 ns	0,148 *
The firm's environment				
Degree of concentration of the market	0,034 ns	0,114 *	0,142 *	-0,008ns
Exchange with the country of the group's mother company	0,159 *	0,212 *	0,259 *	0,311*
Comparative advantage	-0,196 *	-0,110 *	-0,131 *	0,686*
Meat sector	*Reference*	*Reference*	*Reference*	*Reference*
Sea food	0,121 *	0,188**	-0,166 *	0,052 ns
Preparations of fruit and vegetables	0,116*	0,162**	0,011ns	0,054 ns
Oil products	0,190 *	0,089 ns	-0,127 *	-0,097 *
Dairy products	0,310 *	0,323 *	0,120 *	(1)
Processed cereals	0,303 *	0,418 *	0,086 *	-0,094 *
Animal feeding stuffs	0,315*	0,626*	0,061ns	-0,037 ns
Other food products	0,206 *	0,239*	0,098 *	-0,037 ns
Beverages	0,158 *	0,350*	0,117 *	0,069 ns
Number of observations	5742	4844	3997	726
Pseudo R²	0,1531	0,1327	0,0985	0,2151
Correctly classified value	69,05%	78,24%	70,78%	85,54%

(*) significant at 5% ; ** significant at 10%, ns : non significant
(1) non relevant value

French firms use their internal market less than others do. This is especially true concerning imports and purchases from subsidiaries located in the EU. This can be explained by the fact that in order to penetrate their own national market, French subsidiaries abroad can use the group's distribution network directly without going through the parent or sister companies. Their knowledge of the French market can explain why French subsidiaries abroad use their own internal markets less than other firms. Thus, in parallel and despite the lifting of trade barriers within the European market, some cultural, informational as well as economic obstacles persist and seem to lead foreign firms to use their internal market in order to sell goods on the French territory. This reveals the persistence of the border effects within the European Union highlighted by K. Head and T. Mayer (2000). Indeed, these authors show that the unification of the European Market is not yet completed and that the EU market remains, to some degree, fragmented. European countries trade much more between themselves than with other EU countries. This also refers to the importance of the proximity relations in matters of trade and to the persistence of national capitalisms that still structure the European economy (Millington and Bayliss 1996, Amable 2003).

Finally, we find the results obtained above concerning the role of comparative advantages.

The greater this advantage, the lesser the firm's propensity to use its own internal market. This effect has a similar impact on exports. However, although it also plays on the import flows from the European market, in the case of imports from the rest of the world, the impact is highly positive. Could this explain why, in order to penetrate the European markets (which are still highly protected) third countries must rely on the internal markets of multinational firms, the firms' advantages constructing the comparative advantage of the countries? This would explain the highly positive and significant effect of the relations between the firm and its group's parent company when imports from the rest of the world are concerned.

5. Conclusion

The purpose of this study was to highlight the factors that determine, at international level, the decision of a multinational firm to internalise trade. More precisely, our goal was to shed light, at micro-economic level, on the modes of interaction between "firm-specific" advantages and the characteristics of the subsidiaries' environments, in order to better understand what influences multinational groups' decision to favour internalisation over direct transactions on international markets. Our second goal was to determine whether the motives for intra-firm exchanges were different according to whether the transaction occurred on the European market or not.

From the empirical point of view, these questions were addressed at two levels: through a general analysis, aimed to highlight the overall factors at play in the process of internalisation; and through a more precise analysis distinguishing the zones of destination or the origin of the exchanges; zones that are segmented, beyond national contexts, by the borders of the Single European Market. This work required original data concerning the internal and external markets of multinational firms present in France, their organisational characteristics and the types of location zones. This information was provided by the "Industrial Globalisation" survey of the multinational groups present in France and with subsidiaries in other countries, conducted by the SESSI in 1993 and 1999. The econometric approach, which distinguishes the firm-specific determinants from those related to their environments, has enabled us to test the different explicative factors highlighted in literature.

The results show, first of all, that the firms' need to protect and exploit their specific advantages plays an important role in the creation of the firms' internal markets. Thus, the motives for intra-firm trade seem to be related to the need of multinational groups to exploit their technical and organisational scale economies, and to protect and exploit their specific advantages related to the image, the technology, and, more generally, the nature of the product.

But firm-specific advantages also have a different effect depending, first of all, on the zone where the parent company and the subsidiaries are located and, second of all, on the exchange zone. In this respect, the results reveal the role of the close interaction between the firm's characteristics and those of their production and exchange environments in their decision to internalise trade. These decisions vary, for example, according to the nationality of the capital and according to the meso and macro economic contexts of the exchange zones, the heterogeneity of which enables multinational groups to better exploit their own firm-specific advantages.

In this regard, the differentiation of internalisation strategies according to the nationality of the capital and to the exchange zones (France, Europe, Rest of the world) is particularly revealing of a diversity of motives for internalising trade. The destination / origin of exchanges points to the diversity of behaviour in multinational groups in terms of productive organisation and in terms of their positioning in relation to the different national or regional contexts. In particular, not only is it revealing of the groups' endeavours to penetrate the EU markets and to bypass borders, but it also sheds light on the role and the development of intra regional networks of subsidiaries. The development of these networks is indicative of the individual logics of multinational groups but, in turn, they also facilitate the construction of European integration.

But, as several authors such as Millington and Bayliss (1996) have suggested, as long as the cultural and economic barriers continue to segment the European market, the firms' strategies will rest on individual member states more than on Europe as a whole. This refers, first of all, to the necessity to take into account the persistence of national regulations that still structure the European economy in the background of the evolutions generated by the policies of regional harmonisation. This also refers to the advantage of interpreting the processes of exchanges by taking into account the diversity of the individual behaviour of multinational firms, which calls for a more in depth analysis of the theory of the firm in international economics.

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Annex 1 : Distribution of intra-firm exchanges per sector (year 1999)

	Weight of the sector in the total French Agro-food trade		Weight of the sector in the French Agro-food IFT trade		Weight of IFT in total trade of the sector		Average rate of IFT of firms	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
Meat sector	13.9	15.9	3.7	5.6	8.1	7.8	21.77	12.58
Sea food	2.4	10.9	1.9	5.8	25.3	11.7	39.17	23.90
Fruit and vegetables	4.7	11.5	5.8	8.2	38.5	15.7	36.90	30.36
Oil products	1.6	8.3	0.9	11.3	17.5	30.0	32.73	34.19
Dairy products	14.5	10.1	20.8	12.9	44.4	28.1	57.99	28.34
Processed cereals	4.6	3.9	4.9	7.3	32.9	40.8	34.69	26.39
Animal feeding stuffs	4.0	1.9	6.4	1.9	49.0	21.5	35.48	25.78
Other food products	19.0	20.6	16.9	38.8	27.5	41.5	42.22	26.80
Beverages	34.1	8.6	38.7	8.2	35.1	20.8	32.20	24.22
Total	100	100	100	100	30.9	22.0	21.77	12.58

Source : own calculations from Globalisation Survey (SESSI, SCEES, INSEE), French Customs, 1999.

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