

**Mestrado em Economia e Gestão Internacional**  
**Faculdade de Economia, Universidade do Porto**

**Foreign Multinationals and Domestic Companies in  
Portugal: Are there Significant Performance Gaps?**

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## Resumo

A performance empresarial tem sido apontada por vários autores como um importante tópico de pesquisa no ramo dos Negócios Internacionais (*International Business*), principalmente no que diz respeito às empresas multinacionais. As empresas, em geral, coordenam as suas actividades por objectivos e competem para alcançar vantagem competitiva através do desempenho. Esta dissertação investiga se as empresas multinacionais estrangeiras (FO) e as domésticas (DO) diferem em desempenho comparativo. Especificamente, este estudo pretende determinar se há diferenças de performance significativas entre as multinacionais estrangeiras e as suas congéneres domésticas, e se essas diferenças variam consoante as medidas de performance. O enquadramento que subjaz a este estudo baseia-se em teorias de organização industrial (IO) e de negócio internacional (IB), e, na sua aplicação empírica, analisa uma amostra recente (dados para o ano de 2006) que inclui as maiores empresas portuguesas retiradas da base de dados SABI (*Sistema de Análise de Balanços Ibéricos*/Coface MOPE). Este estudo foi realizado utilizando modelos econométricos estimados por método de mínimos quadrados (OLS) com desvios padrão robustos e por regressão de quantis. Os resultados são inequívocos: as empresas FO têm um impacto positivo e significativo na performance empresarial em ambos os tipos de medidas de desempenho usadas (lucro e produtividade). Os resultados deste estudo sugerem que há uma diferença significativa ao nível do desempenho entre as empresas FO e DO na indústria transformadora em Portugal. Este estudo contribui também para o debate sobre medidas de política pública relevantes, nomeadamente aquelas relacionadas com a promoção de investimento directo estrangeiro (IDE), com externalidades, e com os efeitos do IDE em empresas domésticas.

**Palavras chave:** Empresas Multinacionais, Multinacionais Estrangeiras, Empresas Domésticas, Performance, Investimento Directo Estrangeiro

## **Abstract**

Firm Performance has been pointed by different authors as an important research matter in International Business, notably in multinational corporations (MNCs). Organisations in general coordinate their activities by objectives and compete to seek competitive advantage via performance. This dissertation investigates if foreign owned (FO) and domestic owned (DO) firms differ in comparative performance. Specifically, this study seeks to determine if there are significant performance gaps between foreign MNCs and their domestic counterparts, and if those differences/gaps vary with different performance measures. This study draws on an underlying theoretical framework based on industrial organisation (IO) and on international business (IB) theories, which is tested by examining a large scale recent sample (for the year 2006) including the Portuguese top largest firms extracted from the SABI database (*Sistema de Análise de Balanços Ibéricos*/Coface MOPE). This study was done using econometric models estimated by ordinary least squares (OLS) with robust standard errors and by quantile regressions. The results are unequivocal: FO firms have a positive and significant impact in firm performance in both types of performance measures used (profitability and productivity). The findings of this study suggest that there is a significant performance difference between FO and DO firms in the manufacturing industry in Portugal. This study also contributes to the debate about relevant policy measures, notably related to inward investment promotion, performance externalities and effects of inward investments in local economies.

**Keywords:** Multinational Corporations, Foreign Owned firms, Domestic Owned firms, Performance, Foreign Direct Investment.

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## **Index of Acronyms**

AMV: Average market value

DO: Domestic owned firms

EMV: Excess market value

FO: Foreign owned firms

GPM: Gross profit margin

GVA: Gross value added

IB: International business

IO: Industrial organisation

MNCs: Multinational corporations

MTB: Market-to-book ratio

OPMARG: Pre-tax operating margin

OPSAL: Operating cost to sales ratio

OPSALINV: Sales to operating costs ratio

PROFIT: Pre-interest profits

RI: Residual income

ROA: Return on assets

ROE: Return on equity

ROI: Return on investment

ROS: Return on sales

RONA: Pre-tax, pre-interest profits as a percentage of net assets

ROVA: Return on value added

R&D: Research and development

TFP: Total factor productivity

VAP: Value added productivity

## Introduction

Multinational companies (MNCs) have an outstanding role in nowadays' global economy (Narula and Dunning, 2000). A vast number of studies analysed their impact at multiple levels, all related to their direct influence on several key variables (e.g., employment, exports, technology diffusion, tax, revenue – see: Dunning, 1993; Markusen, 1995; Caves, 1996) and to their more indirect but potentially significant impact on domestic firms' behaviour (Bellak, 2004a).

It is recognised that MNCs' impact is related to their performance, both in absolute terms and relatively to their domestic counterparts (Bellak, 2004a). Performance has been measured by many different variables – profitability (Lecraw, 1983; Geringer and Hebert, 2001), return on assets (Geringer, *et al.*, 1989; Kim, *et al.*, 1989; Qian, 1996; Boardman, *et al.*, 1997; Delios and Beamish, 1999; Mathur, *et al.*, 2001), return on investment (Douglas and Craig, 1983; Demirag, 1990; Chen, 1999; Khan, *et al.*, 2002), return on sales (Grant, 1987; Geringer, *et al.*, 1989; Sullivan, 1994; Tallman and Li, 1996; Lu and Beamish, 2001; Capar and Kotabe, 2003; Qian, *et al.*, 2003), gross margin (Christmann, *et al.*, 1999; Elango and Prakash, 2007), among others (Globerman *et al.*, 1994). Even though performance is such an important issue, studies on MNCs and performance are surprisingly scarce (Bellak, 2004a), and even more when comparing the performance of foreign owned (FO) *vis-à-vis* domestic owned (DO) (Williamson, 1977; Luo and Tan, 1998). In spite of the fact that there are relevant studies that compare FO and DO firms (Michel and Shaked, 1986; Kim and Esmeralda, 1990; Aitken and Harrison, 1999; Qian, *et al.*, 2003; Barbosa and Louri, 2005; Kimura and Kiyota, 2007), they are more oriented to matters such as ownership, productivity, multinationality, strategic perspectives, international environmental factors and determinants of capital structure rather than to the analysis of the determinants of performance between FO and DO firms, and that of performance gaps. The underlying theoretical framework relies on (and relates) two major strands: industrial organisation (IO) and international business (IB) theories. IO (Williamson, 1975; Teece, 1985; Davies and Lyons, 1988;

Markusen, 1995; Bellak, 2004a) helps to explain the general question of performance differences between companies based on market structure (industry characteristics) and firm conduct (strategic behaviour, creation of entry barriers such as research and development expenditures, etc). In turn, IB [economic] (Dunning, 1993; Hennart, 2001) and [management-based](Bartlett and Ghoshal, 1989; Buckley, 1990) theories allow us to understand the creation and exploration of firm-specific advantages that explain potential performance differences between DO and FO firms. Thus, we draw on a theoretical framework that helps to understand the determinants of performance and the possible existence of performance gaps between FO and DO firms. This framework is tested against a large scale cross-section data sample of manufacturing firms located in Portugal, an intermediate developed country (Molero, 1996). Such an exercise enables to discuss relevant policy implications, notably on inward investment promotion, performance externalities and effects of inward investments in local economies (Hanson, 2001; Aitken *et al*, 1999; Markusen *et al*, 1999; Barbosa *et al*, 2005).

To summarise, this dissertation seeks to address the following research questions:

1. Are there performance differences between foreign MNCs and domestic firms?  
I.e., does foreign ownership have an impact on firm's performance?
2. Do performance differences between foreign multinationals and domestic firms vary across different performance measures?

This dissertation is divided into five sections. The first one presents the motivation and object of the research. The literature review occupies the second and third sections. The second section contains a literature review on FO/DO performance gaps related to the main theoretical approaches, and the third one provides a review of empirical literature addressing FO/DO performance gaps, and the distinct performance measures and proxies used in the main empirical studies on this theme. The fourth section explains the empirical methodology and makes some considerations about the database and variables. Finally, the last section includes the conclusions and policy implications of this dissertation.

# **Chapter 1. Theoretical foundations and theoretical literature review**

## **1.1. Initial considerations: Industrial Organisation (IO) and International Business (IB) theories**

The purpose of this section is to review the two theoretical literature branches underlying this study (IO and IB), after introducing some brief considerations about MNCs.

MNCs are key players in the global economy (Barba Navaretti and Venables, 2004), and they are also often different when compared with DO firms.<sup>1</sup> Dunning (1993: 3), mentioned that a multinational can be defined as “an enterprise that engages in foreign direct investment (FDI) and owns or controls value-adding activities in more than one country”.<sup>2</sup> It is clear that MNCs are different from purely DO firms (Hanson, 2001). Several studies (e.g., Dunning, 1993; Caves, 1996; Aitken and Harrison, 1999; Blomström and Sjöholm, 1999; De Backer and Sleuwaegen, 2003, 2005) emphasise this distinction, when considering that MNCs are usually larger, have higher productivity and pay higher wages, have more skilled human capital, more intangible assets, are more profitable and display a higher propensity to export.

MNCs’ investments are regarded as a source of benefits, bringing capital inflows, technology and job creation to host economies (Blomström and Sjöholm, 1999; Markusen and Venables, 1999). Markusen and Venables (1999) mentioned that it is possible for FDI to act as a catalyst for local industrial development and that the entry of MNCs has a competition and a linkage effect on domestic industry. By taking advantage of the presence of FOs, DO firms’ performance may be improved

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<sup>1</sup> According to Caves (1996: 1): “The multinational [company] (MNC) is defined as an enterprise that controls and manages production establishments (plants) located in at least two countries”.

<sup>2</sup> In the World Investment Report (UNCTAD, 2007:245), “Foreign direct investment (FDI) is defined as an investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor (FDI enterprise or affiliate enterprise or foreign affiliate)”.

by business interaction and industrial linkages (Guardo and Valentini, 2007). Other authors (e.g. Bellak, 2004b: 35) argue that “from a policy point of view the sources of an improvement of a host country’s performance derived from inward FDI comprise two main effects: the presence effect and transmission effect”.

From these statements, there is an expectation that, owing to their specificity, MNCs’ may have a superior performance than their domestic counterparts.

There are two main theoretical approaches that are important to explain the general question of performance differences between firms - Industrial Organisation (IO) and International Business (IB). The IO approach is based on market structure (industry characteristics) and firm conduct (strategic behaviour, creation of entry barriers such as research and development expenditures, etc).<sup>3</sup> These two schools of thought contribute to understand firms’ characteristics, as well as the structural characteristics of the industry, from a neoclassical (IO) perspective of the firm to a more evolutionary one (IB). It is generally accepted that both theoretical perspectives are crucial for understanding firm performance (Christmann *et al.*, 1999).

## **1.2. Industrial Organisation theory and relevant concepts**

### **1.2.1. Market structure**

Market structure or industry structure refers to size, entry barriers, firms’ cost structure, etc. Such structure determines the behaviour of firms which, in turn, determines the performance of the industry (Porter, 1981; Clarkson and Miller, 1982; Peltzman, 1991). According to Shepherd (1986: 23), “each firm’s performance can influence in some degree its future market position”. The traditional IO paradigm (structure-conduct-performance), developed by Bain (1956) and Mason (1939), suggests that the structural conditions of the industry determines

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<sup>3</sup> According to Clarkson and Miller (1982: 85), market structure “formed the basis for conduct” and conduct “affects firm’s revenues and costs” that influence profitability and other performance indicators.

firm conduct (strategic behaviour) within the industry. Therefore, firm conduct determines the performance of firms in the market, as can be seen in figure 1.

**Figure 1 - The Traditional Bain IO Paradigm**



Source: Adapted from Porter (1981: 611)

The effect of a foreign entry on the market's structure will change the "game conditions" for the established DO firms, with a new type of competition that will affect the conduct and performance of the domestic incumbents (Bellak, 2004). We argue, in line with Ietto-Gillies (2005), that the structure of the industry substantially affects its performance. However, Dunning and Lundan (2008:533) evoke two conflicting hypotheses. The first one is that FO firms may increase competition in their host countries and hence reduce industrial concentration. The second one is related to the ownership-specific advantages (Dunning, 1993), i.e., those advantages FO firms tend to have (superior efficiency, aggressive business practices) when approaching new markets and thus creating barriers to competition and to the operations of DO firms.

### **1.2.2. Concentration and Oligopoly Theory**

The effect of concentration on firm and industry performance has been widely studied in the literature. Bain (1956) and Mason (1939) view "concentration as the starting point in the casual chain leading eventually to performance variables such as profitability and productivity" (Davies and Lyons, 1988: 92). According to Harrigan (1981), studies have found that profitability increases with concentration. Dunning and Lundan (2008) go further and stress that MNCs' activities "are most pronounced in sectors where the market structure is best described as an amalgam of oligopolistic and monopolistic competition". Although a high concentration ratio

should not be put on the same level as the lack of competition (Davies and Lyons, 1988: 73-117).

Developing a model based in oligopolistic market structures, Knickerbocker (1973, in Ietto-Gillies, 2005), defined oligopoly as a market structure characterised by few sellers, with close substitute products and with market interdependence. This author defined oligopolistic equilibrium as a business state between sellers such as “all rivals having roughly the same competitive capabilities, there is little reason for any one rival to expect that it can, with impunity, improve market position of others” (Knickerbocker, 1973:7, in Ietto-Gillies, 2005). Another important point is related with the uncertainty involved in foreign operations and with the learning of the market. FO firms have disadvantages deriving from the foreign environment and the costs of information when compared with DO firms. However, firms in oligopolistic industries have propensity to become multinationals (Caves, 1996:83).

### **1.2.3. Competition / rivalry among firms**

Competition is an ongoing process (Shepherd, 1986: 26) and “[multinational] ownership links can affect the competitiveness of markets” (Caves, 1996: 97). The effect of MNCs on competition in local markets is an important issue. Several studies (e.g. Aitken and Harrison, 1999; Blomström and Kokko 1998; Hanson, 2001) have found evidence that the presence of FDI has a positive effect on DO firms’ productivity and on the development of exports activity (Markusen *et al.*, 1999). Blomström and Sjöholm (1999: 922), using detailed data from Indonesia, showed that “labor productivity is higher in establishments with foreign equity than in purely DO firms and that the latter benefit from spillovers from FDI”. Another aspect is that workers employed by FO firms may accumulate knowledge and management experience which is an asset outside the firm, increasing the competition in the domestic sector (Aitken and Harrison, 1999). MNCs firms tend to be larger than DO firms (Dunning, 1993:151; 427) and also geographically more disperse (Dunning, 1993:73). This aspect is important as it enables them to be in a better position to take advantage of economies of scale and scope (Spence, 1984;



Shepherd, 1986; Dunning, 1993). Barba Navaretti and Venables (2004: 42) argued that FOs perform better than DO firms, that being associated to their “ability of [exploiting] ownership advantages and firm-level economies of scale through horizontal FDI or accessing to competitive factors of production and through vertical FDI”. Concerning an important matter for competition and foreign entry in the domestic market, other authors (Driffield and Munday, 1998) find that the foreign entry leads to a stagnation of profitability in the domestic market. De Backer and Sleuwaegen (2003: 16), when analysing firm entry and exit in the Belgian economy (Belgian manufacturing industries), found evidence that “import competition and FDI crowd out the domestic entrepreneurs on both product and labour markets”. However, they also found empirically positive effects of FDI on domestic entrepreneurship as a result of learning, demonstration and linkage effects between FO and DO firms. Empirical studies by Markusen and Venables (1999) demonstrate in a three-stage model that the entry of a FO firm (assuming that such firms are more efficient) brings a competition effect and forward linkage effects, which may act as a catalyst for industrialisation. This rationale also implies that FOs have usually better performance than domestic companies.

#### **1.2.4. Barriers to entry**

Barriers to entry (a concept related to economies of scale) have a key importance on the existence of non-competitive behaviour (Demsetz, 1982; Davies and Lyons, 1988: 26). The definition of barriers to entry is a controversial matter in Industrial Economics. Bain (1956: 3), in his Industrial Organisation framework, defines the concept of entry barriers “as conditions that allow established firms or incumbents to earn abnormal profits without attracting entry” and he also considered four elements of market structure: economies of scale, absolute cost advantages, product differentiation advantages and capital requirements.

Other authors stressed that entry barriers are key industry-related structural characteristics that can impact on performance (Caves and Porter, 1977; Robinson

and McDougall, 2001) and that can be related to competitive strategies (Harrigan, 1981).

Entry barriers are associated with monopoly power and, according to Caves (1996), there are five types of such barriers: advertising outlays, capital-cost barriers, scale economies, research and development (R&D) and organisational complexity. Caves (1996: 108) suggests that “the same features of market’s structure that explain the coming of [FO] firms also can give rise to barriers to the entry of new firms”. Caves and Porter (1977) defend that the concept of entry barriers is extensible to subgroup structures of industries, which act interdependently in the industry. High barriers to entry impact negatively on new entrants, implying an additional economic effort when comparing with the established advantages of the incumbent firms (Bain, 1959; Caves and Porter, 1977). Benefitting from their international presence, FO firms have advantages to reap economies of scale, notably in industries where capital requirements, advertising and R&D are critical - compared to DO firms, which tend to be more limited in size and investment capacity.

### **1.3. International Business theory and relevant concepts**

The IB literature has been greatly developed in the last four decades (cf., among others, Dunning, 1993; Markusen, 1995; Caves, 1996). It is multidisciplinary and includes an eclectic set of related areas (e.g. Rugman and Brewer, 2001; Dunning and Lundan, 2008). The IO and IB strands are closely inter-related, since the IB literature was influenced by a neoclassical approach in the 1960s and 70s, strongly marked by “profit-maximisation models of the firm” (Dunning and Lundan, 2008:126).

#### **1.3.1. Firm-specific advantages: Hymer’s contribution and Dunning’s Eclectic paradigm**

Certain IB approaches establish that MNCs invest in other countries because they have firm-specific advantages that are not available to purely domestic firms, and

that this can make up for their costs (or liability) of foreignness (Hymer, 1960/1976, in Ietto-Gillies, 2005; Zaheer, 1995) *vis-à-vis* DO firms. This argument stresses the ‘stylised’ fact that MNCs have *per se* a superior performance, as they display such advantages over their domestic counterparts (Dunning, 1993; Markusen, 1995; Caves, 1996).

Hymer, in his seminal work (Hymer, 1960/1976 in Ietto-Gillies, 2005), argued that the existence of market failure (structural imperfections) deriving from market structure (e.g. oligopoly – firms operate under imperfect competition) is a key element for understanding why firms engage on international production, thereby becoming multinationals. He suggested three reasons why MNCs invest abroad: the existence of specific advantages, the removal of conflicts and diversification. The two first determinants are quite close to market imperfections and the last one is more related to a strategy of risk diversification of products, markets or plant locations. Even so, in later developments, Hymer (in Ietto-Gillies, 2005: 62-63) stated that MNCs enable the “planning and organization of production on a worldwide scale”, and implied that FO firms tend to be concentrated in knowledge-intensive sectors (Teece, 1998: 353-390; Caves, 1996).

According to the Eclectic Paradigm (Dunning, 1977; Dunning, 1993), also known as the OLI (Ownership, Location and Internalisation) Framework (*cf.* table 1), MNCs have two types of ownership-specific advantages.<sup>4</sup> The first type relates to proprietary assets detained by the firm – notably related to property rights and intangible assets (Oa), like firm-specific technology, innovatory capacity, etc. The second type of ownership advantage (Ot) is the combination of Oa advantages with complementary (transaction-related) assets – size, product diversity and learning experiences, such as economies of scope and specialisation. According to this perspective, foreign MNCs (in order to be viable, given the Hymerian concept of ‘costs of foreignness’) need to have better specific assets and the possibility of benefiting from greater scale and scope economies than purely domestic firms.

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<sup>4</sup> The ownership-specific advantages concept derives from Hymer’s work. The author stressed that for firms to own and control foreign activities, they need to possess specific advantages (financial, marketing, cost, and innovation-related).

**Table 1- The OLI Paradigm**

<b>Ownership-specific advantages (O)</b>	<b>Location-specific Factors (L)</b>	<b>Internalisation Advantages (I)</b>
<ul style="list-style-type: none"> <li>• Property rights and/or intangible asset advantages;</li> <li>• Advantages of common governance - organizing (Oa) with complementary assets (Ot);</li> <li>• (e.g. size, product diversity and learning experiences of enterprise);</li> <li>• Institutional assets (Oi).</li> </ul>	<ul style="list-style-type: none"> <li>• Possession of natural resources;</li> <li>• Transport and communications; infrastructure;</li> <li>• Tax incentives;</li> <li>• Import controls;</li> <li>• Economies of product or process specialization and concentration;</li> <li>• Low labour costs;</li> <li>• Legal and regulatory system.</li> </ul>	<ul style="list-style-type: none"> <li>• Stability of supplies at right price to control markets;</li> <li>• Reduce transaction costs;</li> <li>• Protect property rights;</li> <li>• Economies of common governance;</li> <li>• Economies of vertical integration and horizontal diversification</li> <li>• Economies of common governance;</li> <li>• Reduce or spread risks.</li> </ul>

Source: Adapted from Dunning and Lundan (2008: 101)

### **1.3.2. Internalisation theory**

Another important contribution is the one provided by internalisation theory (Buckley and Casson, 1976; Hennart, 2001). Buckley and Casson (1976) developed internalisation theory as an alternative theory of international business. Internalisation theory seeks to explain the reasons because cross-border transactions of intermediate products are organised by hierarchies rather than orientated by market forces. The main argument of internalisation theory is related to the fact that firms aim to maximise profits by internalising the intermediate markets across national boundaries because of natural and structural market imperfections (Buckley and Casson, 1976).

In this approach, the main features are the internalisation of markets for intermediate products and for knowledge – as both intermediates and knowledge are hard to price in a regular spot market, thereby creating an extra incentive to produce/develop them internally. This theory gives a considerable relevance to R&D, because “MNCs tend to operate in knowledge-based industries” (Ietto-Gillies, 2005: 107). Hennart (2001: 145) suggested that “MNCs exist because the combination of the assets more efficiently [managed] within an MNC than through

spot markets or contracts”. Although, Dunning and Lundan (2008: 94) argued that internalisation theory “may be considered a general theory in so far as it is able to predict the situations in which firms choose to internalise foreign markets”. Defenders of the internalisation approach recognised the possibility that FO firms “may increase profits through the restriction of competition in final product markets, and that may offset the generally superior allocation of resources associated with MNCs activity” (Cantwell, 2000: 19).

### **1.3.3. Network Theory**

It is argued that FO firms, as they belong to an international network, perform more efficiently, achieve supra-normal profits and are more competitive than DO firms. Cantwell (2000: 39) stressed that firms with weakest (or fewest) ownership advantages in general “hold their position more easily in domestic markets than in international markets” and have high unit costs in relation to other firms in industry. We can bridge this argument with FO and DO firms, in terms of size, efficiency and profitability, arguing that it is more likely that FO firms have superior network advantages relatively to DO firms.

### **1.3.4. Resourced-based view**

The resourced-based view (RBV) of the firm explains how firm resources and capabilities may create competitive advantage (Penrose, 1959; Barney, 1991). In this approach (which derives from Penrose’s (1959) seminal work), firms with valuable, rare, costly to imitate and non-substitutable resources can obtain larger gains than their competitors. It considers that “valuable resources are those that competitors cannot immediately imitate” (Foss *et al.*, 1995: 11) and that those “competences and capabilities lead to sustained superior returns” (Rugman and Verbeke, 2002; Buckley and Casson, 2007; Tan and Mahoney, 2007).

Performance gaps between FO and DO firms could be related to differences in advantages at the firm level. According to Chiao *et al.* (2006: 478) the RBV

“reduces the conceptualization of firm-specific advantage to the level of the firm itself, arguing that there is heterogeneity among firms and that it is the deployment of their unique resources that allows them to achieve sustainable competitive advantages”.

#### **1.4. Concluding comments**

The IB and IO fields are complementary perspectives in regard to the analysis of firm performance. All these theories help to understand why FO firms may and usually have superior performance *vis-à-vis* DOs.

According to the above mentioned theories, there are essential factors such as competition, market structure, barriers to entry, that tend to lead to FO firms having potentially superior performance than DOs, as explained before. FOs tend to have ownership-specific advantages that put them in a more favourable position than DOs, and they have greater incentives for internalisation of some activities, as they operate across borders and tend to have more complex systems to manage. FOs also benefit from belonging to a network and from the advantages that this confers. All these factors help to explain the expectation of performance gaps between FOs and DO firms. These factors are also relevant for the specification of the performance model and of its variables, that include related aspects such as firm specific characteristics (such as size and age) and industry characteristics (such as the concentration ratio).

Taking into consideration the fact that firm-specific characteristics are the main source of firms' heterogeneity, several empirical studies investigated whether FO firms performed better than their domestic counterparts. The following section aims exactly to review these studies, presenting a summary of relevant factors and their theoretical underpinnings.

## **Chapter 2. Empirical literature on multinationals and performance and research hypotheses**

### **2.1. Initial considerations**

The following section presents a summary of empirical studies analysing FO and DO firm's performance and the eventual existence of performance gaps. This review classifies studies according to several key dimensions, notably their theoretical basis, their research focus, the ways in which performance is measured and the proxies used and the period and country focus.

### **2.2. FO/DO performance gaps – main empirical studies**

Table 1 shows a summary of empirical studies concerning FO and DO firms' performance, highlighting different aspects and results, and so, in a clear and synthetic way, contributing to this debate. Generally, these empirical studies are based in IO and IB theories and they intend to compare the performance of FO and DO in different contexts (e.g. in less developed countries, Williamson, 1977; e.g. emerging markets, Luo and Tan, 1998) and with distinct approaches (productivity, ownership, profitability, etc). As can be seen in Table 1, the referred empirical studies that emphasised that DOs perform better than FOs may suggest that the comparison between these two groups of firms is "somewhat ambiguous" (e.g. Barbosa and Louri, 2005). Table 1 highlights that the different performance measures used in these studies may influence the performance gap between FOs and DOs. This matter will be addressed in the next section.

**Table 2 - Summary of empirical studies concerning FO and DO firms performance**

FO vs DO firms	Research Focus concerning FO vs DO firms	Theory	Performance Measure		Country Focus	Period	Reference
FO (+)	FO versus DO firms in LDCs	IO	Sales		LDCs	1970-1973	Williamson (1977)
FO (+) (debt)	FO vs. DO firms: international environmental factors and determinants of capital structure	IO	Debt, Size,	Asset	US	1964-1983	Lee and Kwok (1998)
DO (+)	FO and DO firms financial performance and characteristics	Finance	Risk-adjusted returns (Treyner and Jensen)		US	1973-1982	Michel and Shaked (1986)
DO (+)	FDI Theories and the performance of FO operating in the U.S	IO and IB	Profitability		US	1980-1984	Kim <i>et al.</i> (1990)
FO (+)	Market performance comparison of U.S. firms active in domestic, developed and developing countries	Finance	Risk-adjusted returns (Treyner and Jensen)		LDCs & DCs	1976-1985	Collins and Markham (1990)
FO (+)	Characterising relative performance: the productivity advantage of FO firms in the UK	IO	Productivity (Gross Value Added)		UK	1971-1987	Davies and Lyons (1991)
DO (+)	A comparison of FO and DO firms in an emerging market: a strategic choice perspective	IO and IB	ROS, ROA		China	1994	Luo and Tan (1998)
FO (+)	Comparisons of FO and DO in asian manufacturing over time	IO and IB	Productivity (Value Added per plant)		Asia	1970-1996	Ramstetter (1999)
FO (+)	Does multinationality affect profit performance? an empirical study of U.S. SMEs	IO and IB	ROS		US	1998	Qian <i>et al.</i> (2003)
n.a.	How DO and FO firms differ and why does it matter?	IO and IB	Review of selected studies	of	-	-	Bellak (2004a)
FO (+)	Corporate performance: does ownership matter? a comparison of FO and DO firms	IO and IB	ROA, ROA, Gross ROA	Net	Greece Portugal	1992 1997	Barbosa and Louri (2005)
FO (+)	FO versus DO Firms: economic performance in Japan	IO and IB	ROA, VAP, TFP	ROE,	Japan	1994-2000	Kimura and Kiyota (2007)

Source: Own elaboration



### **2.3. FO/DO relevant performance proxies**

Firm performance has been considered by different authors as an important research matter in IB, notably whether FDI affects firm performance (Ruigrok and Wagner, 2003). The concept of performance has been widely studied (Gomes and Ramaswamy, 1999; Contractor *et al*, 2003), in particular concerning whether there is a systematic relationship between the multinationality of firm and performance. These studies have contributed to the understanding of the development of the concept of performance. As a result of these studies, four models have been developed: linear, U-shaped, inverted U-shaped, S-shaped. The first one, the positive and linear model (Grant, 1987; Tallman and Li, 1996) argues that, if a firm increases its degree of internationalisation (DOI), there is a positive and linear impact on its performance. Other researchers (e.g., Gomes and Ramaswamy, 1999) presented the positive but diminishing returns model that states that the impact of multinationality is greater in the beginning but that over time this impact diminishes the marginal returns. The second and the third models have opposite theories, because one shows evidence of a U-shaped relationship between multinationality and performance (Ruigrok and Wagner, 2003; Capar and Kotabe, 2003) and the other presents an inverted-U relationship between multinationality and performance (Gomes and Ramaswamy, 1999; Elango and Sethi, 2007). The U-shaped relationship model found evidence that firms initially face a negative performance in their process of internationalisation, but with the international experience this situation tends to improve and become positive. The inverted-U relationship model states a different behaviour. According to it, there is a positive performance in the beginning that over time turns negative due to high levels of multinationality. Finally, the sigmoid relationship model (Contractor *et al.*, 2003) argues that there is a multi-shaped curve, starting negative at low foreign sales level that then turns positive, and finally turns negative again as a result of the foreign sales increase.

**Table 3 - Representative studies of the relationship between multinationality and performance**

Effects	Theory	Main ideas	Reference
U	U-shaped relationship	U-shaped nonlinear relationship between MNCs diversification and financial performance	Mathur <i>et al.</i> (2001) Ruigrok & Wagner (2003) Capar & Kotabe (2003)
—	Linear relationship	Multinationality was positively associated with superior profitability; Interactions of international diversity and product diversity indicates a weak effect from increasing internationalization on the performance effect of product diversity	Grant (1987) Tallman & Li (1996)
∩	Reverse U-shaped relationship	Increasing levels of multinationality imply positive performance, but up to a optimum level, than it started to decrease; Inverted U-shaped relationship: larger economies with moderate trade	Gomes & Ramaswamy (1999) Elango & Sethi (2007)
∩	S-shaped – Unified three-stage theory (sigmoid model)	Multishaped curve: negative at low foreign sales level; turns positive; and turns negative (foreign sales increase)	Contractor <i>et al.</i> (2003) Thomas & Eden (2004)

Source: Own elaboration

Thomas and Eden (2004) provided a very important contribution, as they thought of a variable that all other theories had not considered – the importance of the time dimension in the performance measure. This, in their opinion, influences the impact of multinationality. The empirical studies previously presented were relevant because they contributed to the conceptualisation of several performance measures and, although the main focus of these studies related to foreign ownership and performance, they allowed to propose two main typologies: an accounting based typology, which reflects historical performance (accounting based measures such as sales, margins, profitability ratios, etc.) and a market based one, which takes into account and measures investment expectations of future performance (such as Jensen's  $\alpha$  and Tobin's  $q$ ). Table 4 shows the tendency in the eighties and nineties, marked by the appearance of other assessment measures not only focused on accounting matters, but also on return on value-added, total factor productivity, value added productivity, market-to-book, market value, among others. Even so,

there is a consensus that the majority of the measures analysed in empirical studies (e.g. Mathur *et al.*, 2001; Kotabe *et al.*, 2002 Khan *et al.*, 2002) indicates that the conceptualisation of performance is in general an accounting based measure, as can be seen below in Table 4.

**Table 4 - Summary of Performance Measures, Country Focus and Period**

Y	Reference	Research Focus	Performance Measure	Main Control Variables	Country/ Period
1970s	Williamson (1977)	Multinational versus Local Corporations in LDCs	Sales	Industry, Degree of FO	LDCs 1970-1973
	Douglas & Samuel (1983)	Performance of U.S. MNCs in foreign markets	ROI Market Share/Mix	New product, R&D , Sales, Marketing expenditures	US
	Lecraw (1983)	Performance of MNCs in LDCs	Profitability	Market Share, R&D, Tariffs, Capital/Advertising intensity	LDCs 1978-1979
	Michel & Shaked (1986)	MNCs & DMCs financial performance and characteristics	Risk-adjusted returns (Treyner and Jensen)	-	1973-1982
1980s	Benvignati (1987)	Domestic profit advantages of multinational Firms	Profitability	Firm size R&D, Assets, concentration ratio (cr4),import and exports, market share, advertising intensity	US 1975
	Grant (1987)	Relationship between multinationality and firm performance	RONA, ROE, ROS	Firm size	1972-1984
	Lee & Kwok (1998)	MNCs vs. DMCs: international environmental factors and determinants of capital structure	-	Debt, Asset Size	US 1964-1983
	Geringer <i>et al.</i> (1989)	Diversification strategy, internationalization implications for MNCs performance	ROS, ROA	-	1982-1983
	Kim <i>et al.</i> (1989)	Global diversification strategy and corporate profit	ROS, ROA	-	1982-1985

Y	Reference	Research Focus	Performance Measure	Main Control Variables	Country/Period
		performance			
1990s	Kim <i>et al.</i> (1990)	FDI theories and the performance of foreign MNCs operating in the U.S	Profitability	Firm size	US 1980-1984
	Demirag (1990)	MNCs performance measures and their association with contextual variables	ROI, ROE, RI, PROFIT	Firm size	1982-1984
	Collins & Markham (1990)	Market performance comparison of U.S. firms active in domestic, developed and developing countries	Risk-adjusted returns (Treynor and Jensen)	-	LDCs/DCs 1976-1985
	Davies & Lyons (1991)	Characterising Relative Performance: The Productivity Advantage of FO firms in the UK	Productivity GVA	Industry	UK 1971-1987
	Habib & Victor (1991)	Strategy structure and performance of U.S. service MNCs – comparative	ROA	-	US 1987
	Sullivan (1994)	Measuring the degree of internationalization of a firm	ROA, ROS	R&D Intensity Advertising Intensity	1990
	Qian (1996)	The effect of multinationality measures upon the risk-return performance	ROA, ROE	Firm size	US 1981-1990
	Tallman & Li (1996)	The effects of international diversity and product diversity on the performance of MNCs	ROS	Firm size, Leverage Industry Growth	1987
	Boardman <i>et al.</i> (1997)	The role of agency costs in explaining the superior performance of foreign MNCs	ROA	Firm size, Industry	1986-1991
	Gomez-Mejia & Palich (1997)	Cultural diversity and the performance of multinational firms	ROA, MTB	Debt, Firm size R&D, Advertising, Industry, Product Relatedness	1985-1989

Y	Reference	Research Focus	Performance Measure	Main Control Variables	Country/Period
	Majumdar (1997)	The impact of size and age on firm-level performance: some evidence from india	Productivity, Profitability (ROA)	Firm size, Age, Advertising, Capital Intensity, Debt, Sales	India 1988-1994
	Wan (1998)	International and industrial diversification and firm performance of Hong-Kong MNCs	ROE	Firm size, Industry	Hong-Kong 1990-1992
	Luo & Tan (1998)	A comparison of multinational and domestic firms in an emerging market	ROS, ROA	Firm size, Industry, Market Position, Defender, Analyzer	China 1994
	Aitken & Harrison (1999)	Do domestic firms benefit from direct foreign investment?	TFP	Firm size, Industry	Venezuela 1976-1989
	Chen (1999)	International Performance of MNCs: a Hybrid model	ROI, Market Share	Firm size, R&D Industry	1986-1993
	Christmann <i>et al.</i> (1999)	Relative influence of country conditions, industry structure, and business strategy MNCs performance	Gross Margin	Development, Industry Population, Size, TAX, Political	1980-1984
	Delios & Beamish (1999)	Geographic scope and performance of Japanese firms	ROA, ROE, ROS	Industry, Leverage, grow, concentration	1996
	Gomes & Ramaswamy (1999)	The form of the relationship between multinationality and performance	ROA, OPSAL	Firm size, Industry	1990-1993
2000s	Andersson <i>et al.</i> (2001)	Subsidiary performance in MNCs: importance of technology	Sales, AMV	-	1990-1995
	Delios & Beamish (2001)	Financial performance of MNCs with research on foreign subsidiary survival	Profitability	Firm age, Firm size Parent firm size	1987-1996
	Geringer & Hebert (2001)	Measuring Performance of International Joint Ventures (IJVs)	Profitability	Market Share, Technology Quality, Productivity	1988-1989
	Lu & Beamish (2001)	Internationalization and Performance of	ROA, ROS	R&D, SME size Product	1986-1997

Y	Reference	Research Focus	Performance Measure	Main Control Variables	Country/Period
		SMEs		diversification	
	Mathur <i>et al.</i> (2001)	The evidence from Canadian firms on multinational diversification and performance	ROE, ROA, OPMARG	Firm size, Leverage Growth, Efficiency	1992–1994 and 1997
	Khan <i>et al.</i> (2002)	Foreign direct Investment and the performance of MNCs.	ROA, ROI, AMV	Firm size, Investment intensity of R&D, Industry	1999
	Kotabe <i>et al.</i> (2002)	Multinationality and Firm performance.	ROA, OPSALINV	Firm size, R&D Intensity, Marketing Intensity	1988-1993
	Capar & Kotabe (2003)	Relationship between international diversification and performance in service firms	ROS	Firm size, Industry effects (industry dummy's)	1997-1999
	Contractor <i>et al.</i> (2003)	A three-stage theory of international expansion: Link between multinationality and performance in the service Sector	ROS, ROA	Firm size, Sector effect Home country effect	1983-1990
	Goerzen & Beamish (2003)	geographic scope and multinational enterprise performance	Sharpe's measure, Jensen's alpha, ROA, MTB	Product diversity, Industry, Firm age, Capital structure, R&D, Firm size	1999
	Qian <i>et al.</i> (2003)	Does multinationality affect Profit performance? An empirical study of U.S. SMEs	ROS	Firm size, Firm age, R&D, Advertising, leverage	1998
	Ruigrok & Wagner (2003)	Internationalization and performance: an organizational learning perspective	ROA, OPSAL	Firm size, Industry dummy	1993–1997
	Bellak (2004a)	How domestic and foreign firms differ and why does it matter?	Review of selected studies	-	-
	Thomas & Eden (2004)	The shape of the multinationality-performance relationship	ROE, ROA, EMV, AMV	R&D/Sales, Firm size, Debt/Equity, Industry	1990-1994

Y	Reference	Research Focus	Performance Measure	Main Control Variables	Country/Period
	Barbosa & Louri (2005)	Corporate performance: does ownership matter? A comparison of FO and DO firms	ROA, Net ROA, Gross ROA	Firm size, Firm age, R&D, Industry, Debt, CR4	1992 / 1997
	Chiao <i>et al.</i> (2006)	Performance internationalization, and firm-specific advantages of SMEs in a newly-industrialised Economy	ROS	Firm size, Debt Ratio, R&D, Advertising,	Taiwan 1996
	Elango & Sethi (2007)	Relationship between country of origin and the internationalization-performance	OPMARG, GPM	Firm size, R&D, Debt Ratio, Firm, Grow, Exchange rate	1995-2000
	Glaum & Oesterle (2007)	Internationalization and firm performance: more questions than answers?	ROE, ROA, ROS	-	-
	Li (2007)	Multinationality and performance	-	-	-
	Kimura & Kiyota (2007)	Foreign-owned versus domestically-owned firms: economic performance in Japan	ROA, ROE, VAP, TFP	Firm age, R&D, Survive, Industry, Capital labor, Average wage	Japan 1994-2000
	Short <i>et al.</i> (2007)	Firm, strategic group, and industry influences on performance	ROA, Tobin's Q, Altman's Z	Firm, Industry, Strategic group	US 1991-1995
	Gaur & Kumar (2008)	International diversification, business Group affiliation and firm performance	ROS ROA	Firm age, Firm size Industry	India 1997-2001

Source: Own elaboration

The above table summarises various performance measures used in several empirical investigations. Taking into account that our data is based in accounting and financial measures, we intend to set two types of performance models, based in profitability and productivity measures deriving from relevant empirical literature.

The preceding discussion thus leads to the following hypotheses:

- Hypothesis 1 (h1): Foreign ownership has a positive impact on firm's performance;
- Hypothesis 2 (h2): The magnitude of performance differences between FO and DO varies with the use of different performance measures.

These hypotheses will be tested econometrically in the next chapter.



## Chapter 3. Empirical investigation

### 3.1. Initial considerations

This section is focused on the methodology used, on the estimation procedures of the econometric model and on the analysis of the results contrasting them with the relevant theoretical and empirical literature. The results of models' estimation, by ordinary least squares (OLS) with robust standard errors and by quantile regression are presented in Table 9. The purpose of the quantile regression is to complement the results estimated by OLS (*cf.* tables 10, 11 and 12).

### 3.2. Methodology

#### 3.2.1. Empirical model

The econometric model used to test the factors impacting on performance has the following general functional form:

$$\text{Performance}_i = \beta_1 + \beta_2 \text{AGE1}_i + \beta_3 \text{AGE2}_i + \beta_4 \text{SIZE1}_i + \beta_5 \text{SIZE2}_i + \beta_6 \text{CR4}_i + \beta_7 \text{RDSLAG}_i + \beta_8 \text{FO}_i + \beta_9 \text{INTERN}_i + \beta_{10} \text{M1}_i \dots \beta_{27} \text{M18}_i + u_i, \quad (1)$$

Where

“i” represents the firm in the sample: with “i” = 1 to 5509 firms of manufacturing sector

FO = foreign ownership dummy = value of 1 if the FO equity  $\geq 50, 01\%$  and 0 otherwise;

M = manufacturing sub-sector (j) dummies =  $D_{j-1} = D_{19-1} = 18$  dummies (D) =  $D_0 \dots D_{18}$ , where  $j = 1 \dots 19$  and  $D_0$  corresponds to the base dummy of “other manufacturing”

INTERN = international openness dummy = value of 1 if firms have export activity and 0 otherwise.

RDSL<sub>LAG</sub> = represents the ratio of the 5 years lag (2002-2006) of R&D on sales of 2006. The use of the 5 year lag is related to the effort of R&D during the period and its impact in the year 2006's performance.<sup>5</sup>

### 3.2.2. Proxies for the dependent variables

Dependent variables, proxied by several accounting and financial measures, allow us to test the existence of performance gaps between FO and DO firms and if those gaps vary when different performance measures are employed (McGowan, 2007). Thus, a set of two types of performance models are suggested, corresponding to profitability and productivity models. The proposed profitability models include that with a margin based variable – profit margin / PM (Christmann *et al.*, 1999; Elango and Sethi 2007) and another with a return based variable – return on sales / ROS (Grant, 1987)<sup>6</sup>. The productivity model is based on gross value added per employee - GVAEMPL (Davies and Lyons, 1991). The operationalisation of all variables included in the model is summarised in Table 5.

### 3.2.3. Proxies for the explanatory variables

*Main explanatory variable: foreign ownership (FO)*

The main variable of interest (FO) is a dummy variable that assumes the value of 1 if the share of foreign ownership on the focal firm's equity is greater or equal to 50,01% (FO firms) and 0 otherwise.<sup>7</sup> This assumption reflects majority ownership

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<sup>5</sup> The R&D expenditure on sales results from a 5 year lag, as the impact of a R&D effort in a certain year is not immediately felt. This methodology aims to capture in a more realistic way the contribution of R&D to firm performance, and the fact that it is expected that continuous investments planned along 5 years will have an impact on performance. In short, 5 years seem to us a reasonable lag to approach and capture this link between R&D and performance.

<sup>6</sup> The set of two profitability measures (PM and ROS) is to capture the effect of operating revenue and sales revenue.

<sup>7</sup> In our data we proxied foreign ownership with the 50,01% criterion of share of foreign equity. Other studies focus on different levels of share of FO (Luo and Tan, 1998; Bellak, 2004a; Barbosa and Louri, 2005; Kimura and Kiyota, 2007) that can vary from 10% to 50%. Even so, the OECD criterion of FO is the holding of 10% of equity (UNCTAD, 2007:245-247), but even at the OECD level this threshold is proving controversial. Thus, considering a threshold of 50% is more defensible (Tavares-Lehmann and Teixeira, 2007). In any case, in our dataset, most of the firms that have foreign equity have more than a 50% share belonging to foreign investors, and few have between 10% and 50%, which makes the difference irrelevant in our case.

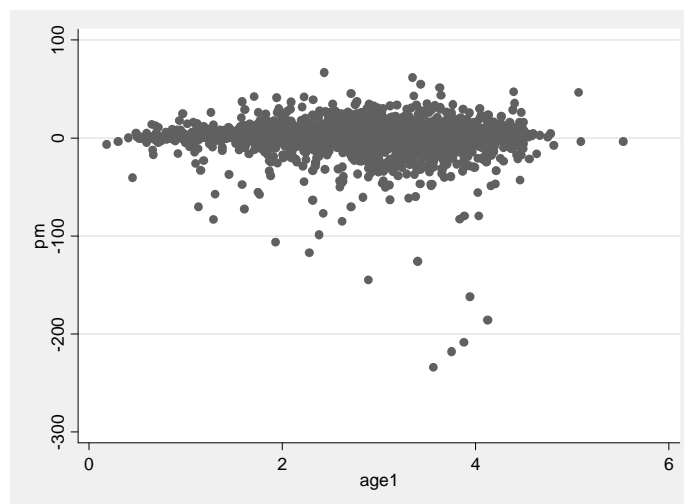
(Tavares-Lehmann and Teixeira, 2007). It is expected that FO firms have a superior performance than DO firms, as explained earlier in the theoretical and empirical literature reviews.

#### *Other explanatory variables*

##### Firm's age

The relation between the age of a firm and its performance has no consensus in the literature (Majumdar, 1997). Firm age is represented by the log of the number of years since the firm was founded and it is the most used proxy for age in the key literature (Delios and Beamish, 2001; Goerzen and Beamish, 2003; Barbosa and Louri, 2005). It is expected that older firms have a superior performance than younger firms. The impact of firm's age (AGE) on performance is expected to be significant (Jovanovic, 1982), though the direction of the effect has not yet been unequivocally established in the performance literature. We introduced the variable AGE2 (log of the number of years squared, since establishment) in order to verify the shape of the curve between age and performance. The following figure presents the relation between AGE1 and Profitability.

**Figure 2 - PM and Age<sup>8</sup>**



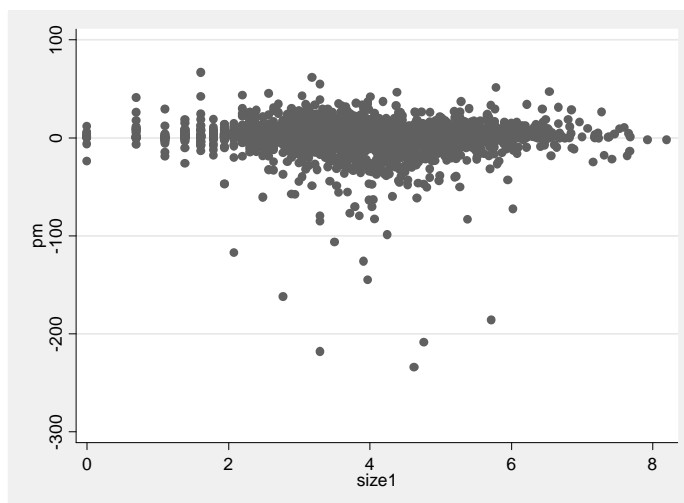
Source: Own elaboration based on STATA statistic analysis

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<sup>8</sup> Firm age is represented by the log of the number of years since the firm was founded.

Firm size (SIZE1 and SIZE2) is a relevant measure affecting performance (Shepherd, 1986) and is often measured by the natural logarithmic function (log) of the number of total employees (Gomes and Ramaswamy, 1999). Other studies use the log of firm's assets (Grant, 1987) and the log of total sales as alternative measures of firm size (Thomas and Eden, 2004). In order to test the significance of this variable, we will operationalise size as the log of the number of total employees. This operationalisation criterion is related to the fact that sales are already proxied (or somewhat included or embedded) in profitability dependent variables, and also because sales are a more volatile measure than the number of employees. It is expected that firm size has a positive effect on firm performance.

**Figure 3 - PM and size<sup>9</sup>**



Source: Own elaboration based on STATA statistic analysis

Industry concentration (CR4) is a variable related to an industry-specific characteristic, and it is measured considering the share of employees included in the manufacturing sub-sectors in the four largest firms, a measure very frequent in the literature commonly known as CR4. The use of this measure aims to help analysing

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<sup>9</sup> Firm size is represented by log of the number of total employees.

the impact of concentration on firm performance. As mentioned before, industry concentration facilitates collusion practices and consequently firms can exercise market power and generate extra profits and also retaliate against entrants. In this vein, it is expected that industry concentration has a positive impact on firm performance.

R&D (RDLAG) intensity ratio is an important variable for the evaluation of differences in firm-specific resources (Penrose, 1959; Barney, 1991). The ratio results from a 5 years lag (2002-2006) of R&D expenditure on sales of 2006. The use of the 5 year lag is related to the effort of R&D along the period and its impact on the performance in 2006. A positive relation between R&D intensity and firm performance is expected

International openness (INTERN) is a dummy variable aiming to proxy the international openness of firms (that takes the value of 1 if the firms have export and import activity and 0 otherwise). It is expected that firms with international openness have better performance (a positive effect is posited).

Industry effects are controlled by a set of manufacturing sub-sector dummy variables (from M1 to M18, in accordance with Table 6), based on sector code of activity (CAE-93 Rev.1).

Table 5 presents a synthesis of the effects expected with the model estimation, having the literature review and the empirical studies as a basis.

**Table 5 - Variables definition, measures and expected signs of influence on performance**

Variable	Unit*	Description and measures	Expected signs
<b>Dependent variables</b>			
PM	%	Operating profit margin = operating profit / operating revenue	
ROS	%	Return on sales (calculated: earnings before taxes / sales and services)	
GVAEMPL	K eur	Gross value added per employee	
<b>Main variable of interest</b>			
FO	-	Dummy variable of foreign ownership: that takes the value of 1 if the foreign share in the firm's equity is greater or equal to 50,01% (FO firms), and 0 otherwise	+
<b>Other variables</b>			
AGE1	-	Log of the number of years since firm was founded	+
AGE2	-	Log of the number of years since firm was founded, squared	-
SIZE1	-	Log of the number of employees	-
SIZE2	-	Log of the number of employees, squared	+
		R&D intensity: R&D expenditure/total sales	+
RDSLAG	K eur	The R&D results from a 5 year lag (2002-2006) with the assumption that missing values are equal to the inexistence of R&D in the firms concerned	
CR4	%	Share of employees included in the four largest firms in manufacturing sub-sectors	+
INTERN	-	International openness of firms: dummy variable that takes the value of 1 if the firms have export and import activity, and 0 otherwise.	+
Mi	-	Sub-Sector code of activity (CAE-93 Rev.1): manufacturing sub-sector dummies =Di-1= 20-1 (i=1 to 19)	
*K eur = 1000 euros unit			

Source: Own elaboration

### 3.2.4. Data and descriptive statistics

For the econometric estimation, the firm-level data used were extracted from the SABI (*Sistema de Análise de Balanços Ibéricos* of Coface MOPE) database that includes the top 30.744 largest firms in Portugal. The reason for selecting the year

2006 was related to data availability and data quality, as recent years have less missing values in the data. Our study focuses on the manufacturing industry, which represents approximately 22% of the total population of this database. The services industry is not considered, because the number of observations of the manufacturing industry was already quite considerable and able to warrant sound econometric modelling and exploration of the issues at stake, without need to introduce further areas of focus.

The initial manufacturing industry sample included 6.739 firms (6.424 DO firms and 315 FO firms). After a preliminary analysis of missing values for the relevant variables, the sample was adjusted to 5.585 firms. Another procedure executed was the ID checking for each firm that was in the sample, in order to detect inconsistency or data duplication.<sup>10</sup> After this procedure, the final sample included 5.509 observations, corresponding to 5.275 DO firms and 234 FO firms, as explained in Table 6.

**Table 6 - Characterisation of the sample – SABI manufacturing classification**

<b>D</b>	<b>Manufacturing</b>	<b>DO (n=5 275)</b>	<b>%</b>	<b>FO (n=234)</b>	<b>%</b>	<b>Total (5 509)</b>	<b>%</b>
<b>M1</b>	Manufacture of food products and beverages	690	13%	24	10%	714	13%
<b>M2</b>	Manufacture of fabricated metal products, except machinery and equipment	589	11%	16	7%	605	11%
<b>M3</b>	Manufacture of wearing apparel; dressing and dyeing of fur	389	7%	5	2%	394	7%
<b>M4</b>	Publishing, printing and reproduction of recorded media	258	5%	11	5%	269	5%
<b>M5</b>	Manufacture of machinery and equipment n.e.c.	403	8%	15	6%	418	8%
<b>M6</b>	Manufacture of furniture; others manufacturing activities, n.e.c.	320	6%	8	3%	328	6%
<b>M7</b>	Manufacture of textiles	485	9%	9	4%	494	9%
<b>M8</b>	Manufacture of pulp, paper and paper products	96	2%	11	5%	107	2%
<b>M9</b>	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear	297	6%	5	2%	302	5%
<b>M10</b>	Manufacture of medical, precision and optical instruments, watches and clocks	31	1%	7	3%	38	1%

<sup>10</sup> Each ID referenced in the database corresponds to a unique ID matching with a Portuguese corporate tax number.

<b>D</b>	<b>Manufacturing</b>	<b>DO (n=5 275)</b>	<b>%</b>	<b>FO (n=234)</b>	<b>%</b>	<b>Total (5 509)</b>	<b>%</b>
<b>M11</b>	Manufacture of other non-metallic mineral products	442	8%	24	10%	466	8%
<b>M12</b>	Manufacture of rubber and plastic products	273	5%	6	3%	279	5%
<b>M13</b>	Manufacture of motor vehicles, trailers and semi-trailers	94	2%	25	11%	119	2%
<b>M14</b>	Manufacture of basic metals	83	2%	7	3%	90	2%
<b>M15</b>	Manufacture of chemicals and chemical products	209	4%	37	16%	246	4%
<b>M16</b>	Manufacture of electrical machinery and apparatus n.e.c.	87	2%	11	5%	98	2%
<b>M17</b>	Manufacture of other transport equipment	48	1%	3	1%	51	1%
<b>M18</b>	Manufacture of radio, television and communication equipment and apparatus	30	1%	7	3%	37	1%
	Others manufacturing*	451	9%	3	1%	454	8%
	<b>Total</b>	<b>5275</b>	<b>100%</b>	<b>234</b>	<b>100%</b>	<b>5509</b>	<b>100%</b>

\*Others manufacturing includes the following: recycling, tobacco products, coke, refined petroleum products and nuclear fuel, wood and of products of wood and cork, except furniture and manufacture of articles of straw and plaiting materials.

Source: Own elaboration based on SABI database industry classification

Descriptive statistics and correlations for the variables estimated are presented as follows. Table 7 shows a summary of the descriptive statistics of the dependent and independent variables. When comparing DO with FO firms we have noticed that there are relevant performance differences, and that the profitability of FOs is higher than DOs. The performance gap is relatively higher comparing productivity as measured by gross value added per employee - FO firms are more productive than DO firms. FOs tends to be in more concentrated sub-sectors and they have more propensity to develop export and import activity.



**Table 7 - Descriptive Statistics by type of ownership**

Type		Pm	Ros	Gvaempl	Age1	age2	size1	size2	cr4	Rdslag	Intern
DO	Mean	1.0440	1.559	30.007	2.971	9.320	3.734	1.492	0.1399	0.347	0.609
	Median	1.3900	1.577	23.115	3.042	9.252	3.714	1.379	0.109	0	1
	Sd	11.582	13.072	44.684	0.700	3.929	0.991	7.675	0.106	2.355	0.488
	Var	134.15	170.89	1996.67	0.4903	1.544	0.981	5.890	0.0113	5.547	0.238
	Count	5275	5275	5275	5275	5275	5275	5275	5275	5275	5275
FO	Mean	3.552	4.2484	58.837	2.987	9.517	4.530	2.257	0.200	0.321	0.777
	Median	3.375	4.112	42.241	2.915	8.496	4.639	21.523	0.129	0	1
	Sd	16.480	177.729	87.383	0.772	4.548	1.434	1.280	0.160	1.518	0.416
	Var	271.59	315.88	7635.8	0.596	2.068	2.055	1.639	0.025	2.303	0.174
	Count	234	234	234	234	234	234	234	234	234	234
All	Mean	1.1505	1.6735	31.294	2.972	9.328	3.769	15.254	0.142	0.346	0.616
	Median	1.43	1.6304	23.606	3.037	9.224	3.714	13.791	0.109	0	1
	Sd	11.841	13.315	47.623	0.704	3.957	1.026	8.105	0.110	2.326	0.486
	Var	140.20	177.29	2268.5	0.495	1.567	1.052	65.704	0.012	5.409	0.236
	Count	5509	5509	5509	5509	5509	5509	5509	5509	5509	5509

Source: Own elaboration based on STATA statistic analysis

It shows on average that FO firms are three times more profitable than DO firms (PM 3.552 vs. 1.0440, and ROS 4.2484 vs. 1.559). Furthermore, on average, FO productivity is almost the double of that in DOs (GVAEMPL 58.827 vs. 30.007).

Table 8 contains the correlation matrix for the variables, allowing for an overview of their interrelationships.

**Table 8 - Correlation matrix**

	1	2	3	4	5	6	7	8	9	10	11
	Pm	Ros	gvaempl	age1	Age2	size1	Size2	cr4	rdslag	fo	Intern
Pm	1.0000										
Ros	0.8687	1.0000									
gvaempl	0.2413	0.2518	1.0000								
age1	-0.0414	-0.0173	-0.0447	1.0000							
age2	-0.0505	-0.0227	-0.0359	0.9819	1.0000						
size1	-0.0454	-0.0239	-0.1294	0.2925	0.3008	1.0000					
size2	-0.0347	-0.0149	-0.0490	0.2621	0.2761	0.9744	1.0000				
Cr4	0.0477	0.0399	0.0853	-0.0544	-0.0452	0.0240	0.0509	1.0000			
Rdslag	-0.1187	-0.1474	-0.0115	-0.0142	-0.0099	0.0432	0.0411	0.0598	1.0000		
Fo	0.0427	0.0407	0.1218	0.0045	0.0100	0.1564	0.1901	0.1108	-0.0069	1.0000	
Intern	0.0263	0.0325	-0.0216	0.3285	0.3086	0.2609	0.2486	-0.0299	0.0065	0.0698	1.0000

Source: Own elaboration based on STATA statistic analysis

As presented in the below table, the correlation matrix show a high correlation between PM/ROS and the low correlation between PM/GVAEMPL and between ROS/GVAEMPL. It must be also noted the correlation between FO/GVAEMPL as well as between FO/Size. Finally Size is correlated with Age.

### 3.2.5 Estimation procedures

Preliminary performance models were estimated through Ordinary Least Squares (OLS). Before analysing the results presented in table 9, it is pertinent to make some considerations on cross-section data<sup>11</sup>. There is a classical concern about

<sup>11</sup> The empirical work was performed using STATA (version 10.0.), an interactive data analysis programme. STATA provides also a wide statistical package, data-management facilities and a wide array of up-to-date of statistical techniques. Detailed information about the STATA, including Tutorials and textbooks can be found in the website: <http://www.stata.com/links/resources.html>. Another helpful source is the STATA site of UCLA, which includes a set of learning modules: <http://www.ats.ucla.edu/stat/stata/modules/default.htm>

empirical studies that use cross-section data, notably the presence of heteroscedasticity in the error terms. A White test (White, 1980) indicated the presence of heteroscedasticity in the data. In this situation, the presence of heteroscedasticity implies that the OLS estimates of the standard errors will be biased. In order to obtain consistent estimates of the standards errors on the coefficients, we corrected the regressions by using the heteroscedasticity-consistent covariance matrix estimation (White, 1980).

In the model estimation, besides using the OLS method with robust standard errors, we undertook a quantile estimation (quantile regression) in order to complement the results provided by the OLS estimations, analysing the effect of the explanatory variables on firm performance, both in firms that present a high level of performance as well as in those that present a lower performance.

This quantile estimation (Koenker and Bassett, 1978) has been used in some empirical studies about firm performance (e.g. Barbosa and Louri, 2005). The quantiles consist on a measure of location that divides the sample in equal shares, in a group organised by size.

However, the existence of heteroscedasticity is frequent in models with cross-section data, as previously explained. In this case, the regression lines are no longer parallel and here lies the interest in estimating the model by quantile regression. The same independent variables of the model influence each quantile of the dependent variable differently. Quantile regression techniques allow a better understanding of the underlying relationship between foreign ownership and firm performance.

In this way, the model to estimate each of the quantiles is the following:

$$\mathbf{Qq \text{ (Performance) } }_i = \beta_1(q) + \beta_2(q) \mathbf{AGE1}_i + \beta_3(q) \mathbf{AGE2}_i + \beta_4(q) \mathbf{SIZE1}_i + \beta_5(q) \mathbf{SIZE2}_i + \beta_6(q) \mathbf{CR4}_i + \beta_7(q) \mathbf{RDSLAG}_i + \beta_8(q) \mathbf{FO}_i + \beta_9(q) \mathbf{INTERN}_i + \beta_{10}(q) \mathbf{M1}_i \dots \beta_{27}(q) \mathbf{M18}_i + u_i , \quad (2)$$

The quantile regression model (Koenker and Bassett, 1978) is operationalised as follows<sup>12</sup>:

$$y_i = x_i' \beta \theta + u_i \theta \quad \text{with} \quad \text{Quant}_\theta(y_i/x_i) = x_i' \beta \theta \quad (3)$$

Where

$y_i$  are the performance (dependent) variables,  $x$  is a vector of regressors and  $\beta$  is the vector of parameters to be estimated, and  $u$  is a vector of residuals.

$Q$  can assume any value of the interval (0,1). We estimated the model for  $Q_{10}$ ,  $Q_{25}$ ,  $Q_{50}$ ,  $Q_{75}$ ,  $Q_{90}$ , to find out the differences of effect of the independent variables over the dependent variables (PM, ROS, GVAEMPL).

As introduced by Koenker e Basset (1978), the definition of the  $q$ th regression quantile ( $\theta$ th regression quantile,  $0 < \theta < 1$ ) solves the following problem:

$$\begin{aligned} \text{Min } \sum_i |u_i| \quad & \text{hi} \\ \text{C, } \beta \end{aligned} \quad (4)$$

Where

$$\begin{aligned} \text{hi} = & \begin{cases} 2q & \text{if } \mu_i > 0, \\ 2(1-q) & \text{if } \mu_i < 0. \end{cases} \end{aligned} \quad (5)$$

The pseudo R-squared of quantile regressions is not directly comparable across estimators or quantiles.

Considering the large number of observations and the vast number of factors which influence firm performance (profitability and productivity), R-squared coefficients are usually low because of the cross-sectional nature of the data, and the fact that

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<sup>12</sup> In the quantile estimation the SQREG command in STATA was used, specified by STATA default, and setting 100 replications for the standard errors estimations by bootstrapping.

firms are very distinct units among themselves. Notwithstanding, the result for the STATA global significance test (F-test) supports the global significance of the overall estimated performance models.

### **3.3. Empirical results and discussion**

#### **3.3.1. OLS regression results**

Considering the OLS regression results (with the White correction, presented in model 2 in table 9), we confirm the first hypothesis (h1), that is, in all estimations after controlling for firm and industry characteristics, the impact of foreign ownership on firms' performance is positive and significant. In what concerns the second hypothesis (h2), and considering what we have seen in the descriptive statistics, FO firms show a superior performance when compared to their domestic counterparts, even when using different measures of performance.

The impact of foreign ownership is considerable on profitability and on productivity. FO firms' impact increases on average the profit margin in 2.13 p.p. and 2.04 p.p. in return on sales. The impact of foreign ownership on firm performance is on average approximately three times higher.

The results suggest relatively less significant impact of foreign ownership on performance when productivity is employed as a proxy for performance. Hence, the strength of the impact of foreign ownership is more pronounced when this proxy for performance is employed.

As we suspected in our preliminary analysis of descriptive statistics, it is confirmed that the impact was still considerable as regards productivity, for which on average FO firm's impact on performance is 17.09 (K Euros). It suggests the importance of multinationality of firms *per se* as a determinant of superior productivity. Moreover, it must be kept in mind that the existence of firm-specific advantages can be additive to (the already confirmed) superior performance of FO firms.

The empirical evidence supports the idea that foreign firms perform better than their domestic counterparts. However, the role of multinational firms in our economy may have different interpretations for stakeholders such as managers and politicians. For managers, the profitability may be the most important objective in short term, but, for politicians, productivity may as well be the right stimulus for the economic structure and for economic competition in the long run.

When MNCs establish abroad they differ from local firms because they bring technology and other proprietary assets (O-specific advantages), allowing firm-specific advantages to compete with local firms, which have a better understanding and knowledge of local market (Hymer, 1960/1976 in Ietto Gillies, 2005; Dunning, 1993; Blomström and Kokko, 1998).

The results are in line with the evidence found by other studies, such as the findings of Davies and Lyons (1991). When characterising the relative performance of manufacturing firms in the UK, they stressed that those FO firms had a productivity advantage over DO firms. Furthermore, evidence by Globerman *et al.* (1994) shows that FO firms enjoy higher value-added per worker than DO Canadian firms. These findings may corroborate that foreign firms have better access to foreign markets that allows operating in a more profitable manner at a larger scale.

One question that may arise is related to the relatively higher productivity of FO firms, that may cause stronger competitive pressure on the Portuguese manufacturing and may also lead to the crowding out of DO firms by the entry of FO firms (De Backer and Sleuwaegen, 2003; Rutkowski, 2006).

Another important issue is the size of the gaps between foreign-owned and domestic-owned firms. If the gaps were larger, the local government would orientate public policies (budgeting more public expenditure to local infra-structure) and FDI policies (such as tax incentives or grants). At the end, if simple policies are implemented, most certainly it would not be so difficult to improve the attractiveness conditions for FDI, increasing the share of FO firms and consequently increasing the performance of the economy, even with lower performance of DO firms.

**Table 9 - Regression Results – OLS White and Quantile regression**

Performance Models	OLS White Correction (1)			OLS White Correction (2)			Quantile Regression		
Variables	Pm	Ros	Gvaempl	Pm	Ros	Gvaempl	Ros	Pm	gvaempl
Age1	3.76*** (1.21)	2.38 (2.08)	-0.78 (6.66)	3.49*** (1.23)	2.16 (2.16)	1.48 (6.38)	1.53*** (0.31)	1.83*** (0.34)	-0.28 (1.49)
Age2	-0.80*** (0.23)	-0.50 (0.41)	0.53 (1.12)	-0.74*** (0.23)	-0.47 (0.42)	-0.15 (1.05)	-0.31*** (0.06)	-0.38*** (0.06)	-0.07 (0.26)
Size1	-2.17*** (0.68)	-1.95** (0.80)	-72.74*** (15.67)	-2.62*** (0.69)	-2.33*** (0.81)	-71.98*** (15.68)	-0.84*** (0.18)	-1.07*** (0.20)	-27.22*** (0.87)
Size2	0.22** (0.09)	0.21** (0.10)	8.50*** (1.85)	0.28*** (0.09)	0.27*** (0.10)	8.52*** (1.85)	0.11*** (0.02)	0.13*** (0.03)	3.20*** (0.11)
Cr4	5.31*** (1.54)	5.31*** (1.79)	18.21** (8.09)	5.40** (2.55)	7.48** (3.37)	57.63*** (21.47)	3.79*** (0.80)	3.37*** (0.85)	26.67*** (3.73)
Rdslag	-0.61*** (0.16)	-0.85*** (0.32)	-0.11 (0.14)	-0.60*** (0.17)	-0.85*** (0.33)	-0.15 (0.17)	-0.18*** (0.02)	-0.30*** (0.02)	-0.02 (0.08)
Fo	2.16* (1.17)	2.17* (1.25)	20.26*** (6.10)	2.13* (1.14)	2.04* (1.22)	17.09*** (5.91)	2.05*** (0.21)	1.81*** (0.23)	14.42*** (1.00)
Intern	1.15*** (0.40)	1.22*** (0.44)	1.26 (0.90)	1.19*** (0.40)	1.41*** (0.45)	3.98*** (0.96)	0.10 (0.10)	0.13 (0.10)	2.91*** (0.45)
Constant	1.01 (1.91)	2.17 (2.88)	168.88*** (36.79)	2.44 (1.98)	2.91 (2.98)	152.55*** (35.77)	0.98* (0.57)	1.06* (0.62)	73.32*** (2.69)
Sub-sector dummies	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5509	5509	5509	5509	5509	5509	5509	5509	5508
R-squared	0.03	0.03	0.14	0.04	0.04	0.16	0.05	0.04	0.32
Adj. R-squared	0.03	0.03	0.14	0.04	0.04	0.17	0.05	0.05	0.32

Robust standard errors in parentheses

Level of significance: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Own elaboration based on STATA regression analysis

As mentioned in the literature review, firm-specific characteristics are *inter alia* important determinants of performance gaps, namely size effects and efficiency. Taking AGE into account, such variable appears to influence performance significantly. In this situation, age has an inverted U-shape relationship with performance (in the PM and in the ROS models). The results for the age variables give evidence of a positive sign in coefficient AGE1 and a negative sign in coefficient AGE2. This suggests that firms in the early stage of their life cycles have a better performance than advanced and more experienced firms (Qian *et al*, 2003).

The results for firm size revealed a negative sign in coefficient SIZE1 and a positive sign in coefficient SIZE2. This interpretation possibly indicates that large firms may reap economies of scale and have better industry knowledge than small firms. Another interpretation is that firm size may be correlated with market power (Shepherd, 1986). However, it is important to refer that the theory is equivocal on the “precise relationship between size and performance” (Majumdar, 1997: pp.233).

Observing that firm size was statistically significant and had a negative coefficient (SIZE1), we assume that there is some tendency that the larger the firm size (measured in our models by the total number of employees), the lower the firm performance (in overall estimated models: profitability and productivity).

In our first regressions CR4 has a positive and significant impact on firm performance for all the profitability (PM and ROS) and productivity (GVAMPL) performance models. Results highlight the positive relationship between industry concentration and firm performance (Hay and Morris, 1991; Caves, 1996). This result is the evidence that in more concentrated sectors, the tendency for market power increases and consequently extra profits arise, and higher performance exists. Because MNCs tend to be presence in concentrated industries, this may encourage entry of more FO firms in the portuguese manufacturing subsectors (De Backer and Sleuwaegen, 2003). As mentioned before, this strategic behaviour (IO approach) may result in the creation of excess capacity (overinvestment) in incumbent FO firms, thus hindering market entry by competitors (Lyons, 1987). However, there are specific sectors that, by their structural nature (and associated with large capital



investments) are naturally concentrated. Although these sub-sectors have high concentration ratios, it is not necessarily true that they are characterised by the lack of competition.

Concerning R&D intensity on sales (RDSLAG), our findings indicate that RDSLAG has a negative or non-significant effect on firm performance. This finding is contrary to general literature (Kim and Lyn, 1990; Pegels and Thirumurthy, 1996; Lööf and Heshmati, 2002; Hanel and St-Pierre, 2002) and so contradicts the expectation of a positive impact on performance. Empirical studies about technological capability and performance have found that R&D intensity on sales had a negative impact on performance and that some firms measure R&D in a different way (Coombs and Bierly, 2006). The same study stresses that some firms develop and experiment new products and processes as part of the manufacturing process.

The results for the variable INTERN show a positive impact of international openness on performance. The variable has a significant impact, notably on the models using PM and ROS as proxies for performance. The import and export activity enables firms to have more experience in international markets and to be able to extend operations or to develop international partnerships with other firms. Another important yet related aspect is the more open an economy is, the more diversified is its product composition. DO firms may strengthen their activity by increasing and diversifying their sales ranges, increasing profit stability and diminishing the performance gaps to FO firms (Kim *et al.*, 1989).

### **3.3.2. Quantile regression results**

In order to complement the results estimated by OLS, we decided to estimate quantile regressions for overall performance measures. Other studies have compared both results (Barbosa and Louri, 2005). For comparison purposes, we maintain in each model the OLS results. Quantile regression (Koenker and Bassett, 1978), as already mentioned, allows to model firms' performance (i.e.

underperforming or overperforming firms) and is robust to the presence of outliers<sup>13</sup>.

When analysing the impact of FO in performance along the quantiles we verify differences across the lower to the higher quantiles. It seems to show that, as we move from the lower to the higher quantiles, the estimated effect of FO on performance (profitability and productivity models) becomes positive and significant.

**Table 10 - Regression Results – OLS White and Quantile regression (PM)**

VARIABLES	OLS White Correction	Quantile Regression PM				
	Pm	q10	q25	q50	q75	Q90
age1	3.49*** (1.23)	6.32** (2.54)	2.98*** (0.61)	1.83*** (0.32)	1.20 (0.98)	-1.53 (2.16)
age2	-0.74*** (0.23)	-1.39*** (0.44)	-0.65*** (0.11)	-0.38*** (0.06)	-0.25 (0.17)	0.27 (0.39)
size1	-2.62*** (0.69)	-1.13 (0.77)	-0.51* (0.26)	-1.07*** (0.39)	-1.79*** (0.56)	-4.83*** (1.61)
size2	0.28*** (0.09)	0.04 (0.11)	0.04 (0.04)	0.13*** (0.05)	0.24*** (0.07)	0.62*** (0.20)
cr4	5.40** (2.55)	-1.91 (6.42)	0.92 (1.15)	3.37* (1.88)	6.85 (4.87)	14.90*** (5.39)
Rdslag	-0.60*** (0.17)	-2.07** (0.93)	-1.11*** (0.26)	-0.30** (0.15)	-0.18** (0.08)	-0.27*** (0.08)
Fo	2.13* (1.14)	-0.36 (1.45)	0.67 (0.58)	1.81*** (0.56)	3.89*** (1.04)	6.22*** (1.84)
Intern	1.19*** (0.40)	1.77*** (0.58)	0.34** (0.15)	0.13 (0.11)	-0.14 (0.25)	0.31 (0.53)
Constant	2.44 (1.98)	-4.96 (3.61)	-1.67** (0.81)	1.06 (0.81)	4.88** (2.15)	16.12*** (4.47)
Observations	5509	5509	5509	5509	5509	5509
Adj. R-squared	0.04					
R-squared	0.04	.	.	.	.	.
Pseudo R-squared		0.0797	0.0314	0.0177	0.0310	0.0494

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Robust standard errors in parentheses

Source: Own elaboration based on STATA regression analysis

<sup>13</sup> Cf. Appendix I, tables 13-15.

The same tendency of the previous profitability regression (PM) was observed. Again, foreign ownership tends to have a positive and significant impact on firm performance in the upper quantiles (q50, q75, q90). Moreover, foreign ownership appears to have an increasingly larger impact the more restrictive the quantile becomes.

**Table 11 - Regression Results – OLS White and Quantile regression (ROS)**

VARIABLES	OLS White Correction	Quantile Regression ROS				
	Ros	q10	q25	q50	q75	q90
age1	2.16 (2.16)	7.00*** (2.22)	2.14*** (0.61)	1.53*** (0.31)	1.10 (0.89)	-3.60 (2.29)
age2	-0.47 (0.42)	-1.60*** (0.40)	-0.45*** (0.12)	-0.31*** (0.06)	-0.21 (0.15)	0.67 (0.42)
size1	-2.33*** (0.81)	-0.79 (0.78)	-0.29 (0.22)	-0.84** (0.37)	-1.63*** (0.63)	-5.18*** (1.59)
size2	0.27*** (0.10)	0.02 (0.12)	0.02 (0.03)	0.11** (0.05)	0.25*** (0.08)	0.67*** (0.19)
cr4	7.48** (3.37)	-2.33 (6.63)	0.67 (1.19)	3.79** (1.88)	7.69 (4.90)	26.40** (13.23)
Rdslag	-0.85*** (0.33)	-1.95*** (0.60)	-1.29** (0.50)	-0.18 (0.15)	-0.15*** (0.05)	-0.28*** (0.06)
Fo	2.04* (1.22)	-0.65 (1.62)	0.64 (0.63)	2.05*** (0.59)	4.46*** (1.14)	7.55*** (1.90)
Intern	1.41*** (0.45)	1.29** (0.59)	0.29*** (0.11)	0.10 (0.12)	-0.26 (0.25)	-0.13 (0.56)
Constant	2.91 (2.98)	-5.48* (2.96)	-1.17 (0.81)	0.98 (0.78)	4.24** (2.08)	17.85*** (4.83)
Observations	5509	5509	5509	5509	5509	5509
Adj. R-squared	0.04					
R-squared	0.04					
Pseudo R-squared		0.083	0.0191	0.0175	0.0310	0.0484

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Robust standard errors in parentheses

Source: Own elaboration based on STATA regression analysis

In contrast with the two previous profitability models (PM and ROS), the productivity model (GVAEMPL) allows us to witness that FO is positive and

significant in almost all quantiles, both in lower and in upper quantiles (q25, q50, q75 and q90).

**Table 12 - – Regression Results – OLS White and Quantile regression (GVAEMPL)**

VARIABLES	OLS White Correction	Quantile Regression GVAEMPL				
	Gvaempl	q10	q25	q50	q75	q90
age1	1.48 (6.38)	4.93*** (1.65)	2.09* (1.19)	-0.28 (1.54)	-1.22 (2.45)	5.16 (4.65)
age2	-0.15 (1.05)	-0.85*** (0.29)	-0.40* (0.21)	-0.07 (0.27)	0.06 (0.42)	-1.09 (0.78)
size1	-71.98*** (15.68)	-7.35*** (1.51)	-14.52*** (1.42)	-27.22*** (2.48)	-47.79*** (4.77)	-94.66*** (9.70)
size2	8.52*** (1.85)	0.78*** (0.18)	1.64*** (0.17)	3.20*** (0.30)	5.78*** (0.61)	11.53*** (1.19)
cr4	57.63*** (21.47)	-1.15 (10.31)	16.80** (7.50)	26.67** (10.82)	85.72** (38.11)	181.76*** (57.68)
Rdslag	-0.15 (0.17)	-0.17 (0.20)	-0.15** (0.08)	-0.02 (0.16)	-0.00 (0.19)	0.03 (0.23)
Fo	17.09*** (5.91)	2.98 (2.05)	7.65*** (1.74)	14.42*** (2.03)	24.66*** (4.50)	36.71*** (9.07)
Intern	3.98*** (0.96)	1.75*** (0.32)	2.05*** (0.29)	2.91*** (0.42)	4.39*** (0.64)	4.62*** (1.20)
Constant	152.55*** (35.77)	22.91*** (4.28)	41.39*** (3.32)	73.32*** (5.35)	111.00*** (10.57)	188.89*** (20.94)
Observations	5509	5509	5509	5509	5509	5509
Adj. R-squared	0.16					
R-squared	0.17					
Pseudo R-squared		0.0667	0.10117	0.1262	0.1654	0.2287

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Robust standard errors in parentheses

Source: Own elaboration based on STATA regression analysis

The three former quantile estimations allowed to complement the OLS results (with White correction and robust standard errors) and enable us to conclude that foreign ownership impacts on firm performance for the higher quantiles (upper to q50) for all performance measures.

Even using different performance measures, the impact of foreign ownership on firm performance is still evident and significant, although the quantile regression is a median based estimator.

## **Chapter 4. Conclusions and policy implications**

### **4.1. Conclusions**

This dissertation tested the existence of performance differences between foreign MNCs and domestic firms (i.e., does foreign ownership have an impact on firm's performance) and if those differences between foreign multinationals and domestic firms vary with different performance measures.

The main contribution of this dissertation is that it represents a novelty, large scale and robust empirical examination of the relationship between foreign ownership and firm performance in the portuguese manufacturing industry.

The impact of foreign ownership on firms' performance is positive and significant.

The findings of this study suggest that there is a significant performance difference between FO and DO firms in the manufacturing industry in Portugal. FO firms have a positive and significant impact on firm performance in both types of performance measures used (profitability and productivity).

The variables related to dimension (size), market concentration (CR4) and international openness (INTERN) presented a significant and positive impact on overall performance measures models. FO firms exploit sources of competitive advantage not available to DO firms. The findings may suggest that FO firms exploit economies of scale better than their domestically owned counterparts. This may be explained because, in addition to a size advantage, FO firms benefit from a better access to foreign markets and they have more management capabilities to operate in more complex environment.

MNCs' specific characteristics (such as size, R&D expenditure, management capabilities, among others) are an advantage *vis-à-vis* domestic firms. At the same time, FO firms contribute to the improvement of the average performance of portuguese manufacturing industry.

## 4.2. Policy implications

The results of this study point to some relevant policy implications.

First of all, they suggest that it is rational to attract foreign multinationals, as these are more productive than the domestic sector. This superior performance generates, as Markusen and Venables (1999) noted, a competition and a demonstration (benchmark) effect.

Secondly, and related to the fact that not all multinationals have the same quality or potential impact, these results indicate that portuguese authorities should, when proactively seeking new foreign investors, think about trying to attract those companies whose performance levels are higher in their respective industries. Thirdly, when betting on attracting new projects from foreign MNCs already established in Portugal, such authorities should devote more effort to those firms that exhibit more considerable performance levels.

Fourthly, and considering the performance gap clearly identified between FOs and DO firms, specific programmes aiming to transfer best practices from FOs to Dos should be implemented. Such a programme could focus, for instance, on promoting linkages between domestic companies and FOs (e.g. supply linkages – as the foreign MNCs would impose standards and transfer practices to their suppliers, as well as other mechanisms of sharing knowledge and managerial practices – for instance, the current strategy aiming to set up a cluster policy, enhancing linkages between domestic and foreign actors, SMEs and larger firms).

More specific policy implications deriving directly from the present results are as follows. The higher profitability of FO firms implies higher tax returns per unit of input used, therefore meaning a higher tax efficiency of FOs *vis-à-vis* DOs. The result of higher GVA per employee is related to better working conditions and higher compensation packages for local employees (Hanson, 2001), therefore meaning that FOs, in this regard, contribute to the general welfare of the host economy. The combination of the results of higher FO firms' profitability with higher GVA per employee and the larger size of FOs points to the creation of more, better and more sustainable employment.

## References

- Aitken, B. J., and Harrison, A. E. (1999), "Do Domestic Firms Benefit from Direct Foreign Investment? Evidence from Venezuela", *American Economic Review*, Vol. 89, No 3, pp. 605-618.
- Andersson, U. and Forsgren, M. and Pedersen, T. (2001), "Subsidiary performance in multinational corporations: the importance of technology embeddedness", *International Business Review*, No. 10, pp. 3-23.
- Bain, J. (1956), *Barriers to New Competition*, Harvard University Press: Cambridge.
- Bain, J. (1959), *Industrial Organization*, Wiley: New York.
- Barbosa, N. and Louri, H. (2005), "Corporate Performance: Does Ownership Matter? A Comparison of Foreign-and Domestic-Owned Firms in Greece and Portugal", *Review of Industrial Organization* Vol. 27, No.1, pp.73-102.
- Barney, J. B., (1991), "Firm Resources and Sustained Competitive Advantage", *Journal of Management*, Vol. 17, No.1, pp. 99-120.
- Bartlett, C. A. and Ghoshal, S. (1989), *Managing Across Borders: The Transnational Solution*, Boston: Harvard Business School Press.
- Bellak, C. (2004a), "How Domestic and Foreign Firms Differ and Why Does it Matter?", *Journal of Economic Surveys*, Vol. 18, No.4, pp. 483-514.
- Bellak, C. (2004b), "How performance gaps between domestic and foreign firms matter for economic policy?", *Transnational Corporations*, Vol. 13, No.2, pp. 29-55.
- Benvignati, A. (1987), "Domestic Profit Advantages of Multinational Firms", *The Journal of Business*, Vol. 60, No. 3 , pp. 449-461.
- Blomström M. and Kokko A. (1998), "Multinational corporations and spillovers", *Journal of Economic Surveys*, Vol. 12, pp. 247-277.



- Blomström M. and Sjöholm, F. (1999), "Foreign Direct Investment - Technology transfer and spillovers: Does local participation with multinationals matter?", *European Economic Review*, Vol. 43, pp. 915-923.
- Boardman, A. E. and Shapiro, D. M. and Vining, A. R. (1997), "The role of agency costs in explaining the superior performance of foreign MNE Subsidiaries", *International Business Review*, Vol. 6, No. 3, pp. 295-317.
- Buckley, P. (1990), "Problems and Developments in the Core Theory of International Business", *Journal of International Business Studies*, Vol. 21, pp. 657-665.
- Buckley, P. and Casson, M. (2007), "Edith Penrose's Theory of the Growth of the Firm and the Strategic Management of Multinational Enterprises", *Management International Review*, Vol. 47, No.2, pp.151-173.
- Cantwell, J. (2000), *A Survey of Theories of International Production*, Chapter 2 in Christos N. Pitelis and Roger Sugden (eds.), *The Nature of the Transnational Firm*, Routledge, 2nd edition: pp. 10-56.
- Capar, N. and Kotabe, M. (2003), "The relationship between international diversification and performance in service firms", *Journal of International Business Studies*, No. 34, pp. 345-355.
- Caves, R. (1996), *Multinational Enterprise and Economic Analysis*, second edition, Cambridge: Cambridge University Press.
- Caves, R. and Porter, M. (1977), "From Entry Barriers to Mobility Barriers", *The Quarterly Journal of Economics*, Vol. 91, No. 2, pp. 241-262.
- Chen, H. (1999), "International Performance of Multinationals: a Hybrid model", *Journal of World Business*, pp.157-170.
- Chiao, Y. and Yang, K. and Yu, C. J. (2006), "Performance Internationalization, and Firm-specific Advantages of SMEs in a Newly-Industrialized Economy", *Small Business Economics*, Vol. 26, pp.475-492.

- Christmann, P. and Day, D. and Yip, G. S. (1999), "The relative influence of country conditions, industry structure, and business strategy on multinational subsidiary performance", *Journal of International Management*, No.5, pp.241-265.
- Clarkson, K. and Miller, R. L. (1982), *Industrial Organization – Theory, Evidence and Public Policy*, McGraw-Hill.
- Collins, J. M. (1990), "A Market Performance Comparison of U.S. Firms Active in Domestic, Developed and Developing Countries", *Journal of International Business Studies*, Vol. 21, No. 2, pp. 271-287.
- Coombs, J. and Bierly, P. (2006), "Measuring technological capability and performance", *R&D Management*, Vol. 36, No. 4, pp. 421-438.
- Contractor, F. J. and Kundu, S. K. and Hsu, C. (2003), "A Three-Stage Theory of International Expansion: The Link between Multinationality and Performance in the Service Sector", *Journal of International Business Studies*, Vol. 34, No.1, pp. 5-18.
- Davies, S. and Lyons, B. (1991), "Characterising Relative Performance: The Productivity Advantage of FO firms in the UK", *Oxford Economic Papers*, New Series, Vol. 43, No. 4, pp. 584-595.
- Davies, S. and Lyons, B. (1988), *Economics of Industrial Organization*, Surveys in Economics, London: Longman.
- De Backer, K. and Sleuwaegen, L. (2003), "Does foreign direct investment crowd out domestic entrepreneurship", *Review of Industrial Organization*, Vol. 22, pp. 67-84.
- De Backer, K. and Sleuwaegen, L. (2005), "A Closer Look at the Productivity of Foreign Affiliates", *International Journal of the Economics of Business*, Vol. 12, No.1, pp. 17-34.
- Delios, A. and Beamish, P. W. (1999), "Geographic Scope and Performance of Japanese Firms", *Strategic Management Journal*, Vol. 20, pp. 711-727.

- Delios, A. and Beamish, P. W. (2001), "Survival and Profitability: The Roles of Experience and Intangible Assets in Foreign Subsidiary Performance", *Academy of Management Journal*, Vol. 44, No. 5, pp.1028-1038.
- Demirag, I. S. (1990), "Multinational performance measures and their association with contextual variables", *Accounting and Business Research*, Vol. 20, pp. 275-285.
- Demsetz, H. (1982), "Barriers to Entry", *American Economic Review*, Vol. 72, No. 1, pp. 47-57.
- Douglas, S. P. and Craig, S. C. (1983), "Examining Performance of U. S. Multinationals in Foreign Markets", *Journal of International Business Studies*, Vol. 14, No.3, pp. 51-62.
- Driffield, N. and Munday, M. (1998), "The Impact of Foreign Direct Investment on UK Manufacturing: Is there a Profit Squeeze in Domestic Firms?", *Applied Economics*, Vol. 30, No. 5, pp. 705-709.
- Dunning, J. (1977), "Trade, location of economic activity and the MNE: a search for an eclectic Paradigm". In Wijkman, P. (ed.), *The International Allocation of Economic Activity*. London: Macmillan, pp. 395-418.
- Dunning, J. (1993), *Multinational Enterprises and the Global Economy*, Wokingham, England, Reading Mass, Addison-Wesley.
- Dunning, J. and Lundan, S. (2008), *Multinational Enterprises and the Global Economy*, second edition, Edward Elgar, Cheltenham, UK.
- Elango, B. and Sethi, S. P. (2007), "An Exploration of the Relationship between Country of Origin (COE) and the Internationalization- Performance Paradigm", *Management International Review*, Vol. 47, pp. 369-392.
- Foss, J. N. and, Knudsen, C. and Montgomery, C. (1995), "An Exploration of Common Ground: Integrating Evolutionary and Strategic Theories of the

- Firm”, in Montgomery, Cynthia, Eds, *Resource-Based and Evolutionary Theories of the Firm: Towards a Synthesis*, Kluwer Academic Publishers: US.
- Gaur, A. S. and Kumar, V. (2008), “International Diversification, Business Group Affiliation and Firm Performance: Empirical Evidence from India”, *British Journal of Management*, pp.1-15.
- Geringer, J. M. and Beamish, P. W and Costa, R. C. (1989), “Diversification strategy and internationalization implications for MNE performance”. *Strategic Management Journal*, Vol. 10, pp. 109-111.
- Geringer, J. M. and Hebert, L. (2001), “Measuring Performance of International Joint Ventures”, *Journal of International Business Studies*, Vol. 22, No. 2, pp. 249-263.
- Glaum, M. and Oesterle, M. (2007), “40 Years of Research on Internationalization and Firm Performance: More Questions than Answers?”, *Management International Review*, Vol. 47, pp. 307-317.
- Globerman, S. and John, C. R. and Ilan, V. (1994), “The Economic Performance of Foreign Affiliates in Canada”, *The Canadian Journal of Economics*, Vol. 27, No. 1, pp. 143-156.
- Goerzen, A. and Beamish, P. W. (2003), “Geographic scope and multinational enterprise performance”, *Strategic Management Journal*, No. 24: pp. 1289-1306.
- Gomes, L. and Ramaswamy, K. (1999), “An empirical examination of the form of the relationship between multinationality and performance”, *Journal of international business studies*, pp. 173-188.
- Gomez-Mejia, L. R. and Palich, L. E. (1997), “Cultural Diversity and the Performance of Multinational Firms”, *Journal of International Business Studies*, Vol. 28, No. 2, pp. 309-335.
- Grant, R. M. (1987), “Multinationality and performance among British manufacturing companies”. *Journal of International Business Studies*, pp. 79-89.

- Guardo, C. and Valentini, G. (2007), "Taking Actively Advantage of MNCs' Presence", *Small Business Economics*, Vol. 28, No. 1, pp. 55-68.
- Habib, M. M. and Victor, B. (1991), "Strategy, Structure, and Performance of U.S. Manufacturing and Service MNCs: A Comparative Analysis", *Strategic Management Journal*, Vol. 12, No. 8, pp. 589-606.
- Hanel, P. and St-Pierre, A. (2002), "Effects of R&D Spillovers on the Profitability of Firms", *Review of Industrial Organization*, Vol. 20, Np.4, pp. 305-322.
- Hanson, G. (2001), "Should countries promote foreign direct investment?", G24 Discussion paper Series, No. 9, February. New York and Geneva: United Nations.
- Harrigan, K. (1981), "Barriers to Entry and Competitive Strategies", *Strategic Management Journal*, Vol.2, No. 4, pp. 395-412.
- Hay, D. and Morris, D. (1991) *Industrial Economics and Organization: Theory and Evidence*. 2nd ed., Oxford: Oxford University Press
- Hennart, J. (2001), *Theories of the Multinational Enterprise*, Chapter 5 in Alan M. Rugman and Thomas L. Brewer, *The Oxford Handbook of International Business*, Oxford University Press, pp. 127-148.
- Ietto-Gillies, G. (2005), *Transnational Corporations and International Production*, Concepts, Theories and Effects, Cheltenham: Edward Elgar.
- Jovanovic, B. (1982), "Selection and the Evolution of Industry", *Econometrica*, Vol. 50, No.3, pp-649-670.
- Khan, H. A. and Wu, J. and Kang, C. (2002), "Foreign Direct Investment and the performance of MNCs", CIRJE Discussion papers: in, <http://www.e.u-tokyo.ac.jp/cirje/research/03research02dp.html>, accessed in 26-04-08.
- Kim, W C. and Hwang, P. and Burgers, W. P. (1989)," Global Diversification Strategy and Corporate Profit Performance", *Strategic Management Journal*, Vol. 10, pp. 45-57.

- Kim, W. S. and Lyn, E. O. (1990), "FDI Theories and The Performance of Foreign Multinationals Operating in the U.S.", *Journal of International Business Studies*, Vol.21, No. 1, pp. 41-54.
- Kimura, F. and Kiyota, K. (2007), "Foreign-owned versus Domestically-owned Firms: Economic Performance in Japan", *Review of Development Economics*, Vol.11, No. 1, pp. 31-48.
- Koenker, R. and Bassett, G. (1978), "Regression Quantiles", *Econometrica*, Vol. 46 No. 1, pp. 33-50.
- Kotabe, M. and Srinivasan, S. S. and Aulakh, P. S. (2002), "Multinationality and Firm Performance: The Moderating Role of R&D and Marketing Capabilities", *Journal of International Business Studies*, Vol. 33, No. 1, pp. 79-97.
- Lecraw, D. J. (1983), "Performance of Transnational Corporations in Less Developed Countries", *Journal of International Business Studies*, Vol. 14, No. 1, pp. 15-33.
- Lee, K. C. and Kwok, C. C. Y. (1988), "Multinational Corporations vs. Domestic Corporations: International Environmental Factors and Determinants of Capital Structure", *Journal of International Business Studies*, Vol. 19, No. 2, pp. 195-217.
- Li, L. (2007), "Multinationality and performance: A synthetic review and research agenda", *International Journal of Management Reviews*, Vol. 9, No2, pp.117-139.
- Löf, H. and Heshmati, Almas (2002), "Knowledge capital and performance heterogeneity: A firm-level innovation study", *International Journal of Production Economics*, Vol. 20, No.1, pp. 61-85.
- Lu, J. W. and Beamish, P. W. (2001), "The Internationalization and Performance of SMEs", *Strategic Management Journal*, Vol. 22, No. 6/7, pp. 565-586.
- Luo, Y. and Tan, J. J. (1998), "A comparison of multinational and domestic firms in an emerging market: A strategic perspective", *Journal of International Management*, Vol. 4, No. 1, pp. 21-40.

- Lyons, B. (1987), "Strategic behaviour by firms", in: Roger Clarke and Tony McGuinness, eds., *The Economics of the Firm* (Oxford: Basil Blackwell), pp. 62-82.
- Majumdar, S. K. (1997), "The Impact of Size and Age on Firm-Level Performance: Some Evidence from India", *Review of Industrial Organization*, Vol. 12, pp.231-241.
- Markusen, J. R. (1995), "The Boundaries of Multinational Enterprises and the Theory of International Trade", *The Journal of Economic Perspectives*, Vol. 9, No. 2, pp. 169-189.
- Markusen, J. R. and Venables, A. J. (1999), "Foreign Direct Investment as a Catalyst for Industrial Development", *European Economic Review*, Vol. 43, No.1, pp. 335-356.
- Mason, E. S. (1939), "Price and product policies of large scale enterprise", *American Economic Review*, Vol. 29, No.1, pp. 61-74.
- Mathur, I. and Singh, M. and Gleason, K. C. (2001), "The evidence from Canadian firms on multinational diversification and performance", *The Quarterly Review of Economics and Finance*, No. 41, pp. 561-578.
- McGowan, C. B. (2007), "Using financial ratios to differentiate domestic and multinational corporations", *Applied Financial Economics*, Vol.17, pp. 1071-1074.
- Michel, A. and Shaked, I. (1986), "Multinational corporations vs. domestic corporations: financial performance and characteristics, *Journal of International Business Studies*, pp. 89-100.
- Molero, José (1996), *Technological Innovation, Multinational Corporations and New International Competitiveness: The Case of Intermediate Countries*, Harwood academic publishers.
- Narula, R. and Dunning, J. H. (2000) "Industrial Development, Globalization and Multinational Enterprises: New Realities for Developing Countries", *Oxford Development Studies*, Vol. 28, No. 2, pp.141-167.

- Navaretti, G. B. and Venables, A. J. (2004), *Multinational Firms in the World Economy*, Princeton: Princeton University Press.
- Pegels, C. and Thirumurthy, M. (1996), “The impact of technology strategy on firm performance”, *Transactions on Engineering Management*, Vol. 43, No.3, pp. 246-249.
- Penrose, E. T. (1959), *The Theory oh the Growth of the firm*, Oxford: Basil Blackwell.
- Peltzman, S. (1991), “The Handbook of Industrial Organization”, *The Journal of Political Economy*, Vol. 99, No. 1, pp. 201-217.
- Porter, M. (1981), “The Contributions of Industrial Organization to Strategic Management”, *The Academy of Management Review*, Vol. 6, No. 4, pp. 609-620.
- Qian, G. (1996), “The effect of Multinationality Measures upon the risk-return Performance of US firms”, *International Business Review*, Vol. 5, No.3, pp. 247-265
- Qian, G. (1998), “Determinants of profit performance for the largest U.S. firms 1981-92”, *Multinational Business Review*, pp. 44-51.
- Qian, G. and Yang, L. and Wang, D. (2003), “Does Multinationality Affect Profit Performance? An Empirical Study of US SMEs”, *Journal of General Management*, Vol. 28, No.4, pp. 37-46.
- Ramstetter, E. D. (1999), “Comparisons of Foreign Multinationals and Local Firms in Asian Manufacturing Over Time”, *Asian Economic Journal*, Vol. 12, No 2, pp. 163-203.
- Robinson, K. and McDougall, P. (2001), “Entry Barriers and New Venture Performance: A Comparison of Universal and Contingency Approaches”, *Strategic Management Journal*, Vol. 22, No. 6/7, Special Issue, pp. 659-685.

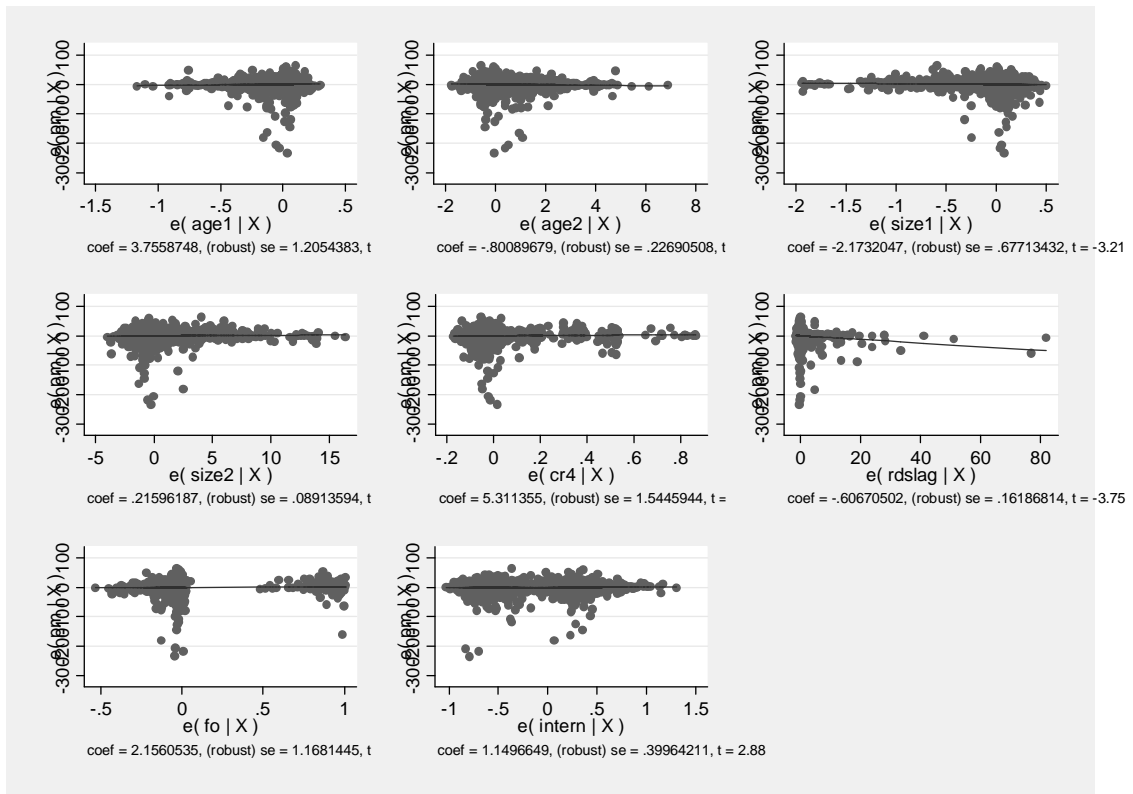


- Ruigrok, W. and Wagner, H. (2003), "Internationalization and Performance: An Organizational Learning Perspective", *Management International Review*, Vol. 43, pp. 63-83.
- Rugman, A. and Brewer, T. (2001), *The Oxford Handbook of International Business*, Oxford University Press, Oxford.
- Rugman, A. and Verbeke, A. (2002), "Edith Penrose's Contribution to the Resource-Based View of Strategic Management", *Strategic Management Journal*, Vol.23, No.8, pp.769-780.
- Rutkowski, A. (2006), "Inward FDI, concentration, and profitability in the CEECs: Were the domestic firms crowded out or strengthened?", *Transnational Corporations*, Vol. 15, No.3, pp. 107-142.
- Shepherd, W. G. (1986), "On the Core Concepts of Industrial Economics", in H. W. de Jong and W.G. Shepherd, Eds, *Mainstreams in Industrial Organization*, Dordrecht: Martinus Nijhoff Publishers.
- Short, J. C. and Ketchen, D. J. and Palmer, T. B. and Hult, T. M. (2007) "Firm, Strategic Group, and Industry Influences on Performance", *Strategic Management Journal*, Vol.28, pp. 147-167.
- Spence, A. M. (1984), "Industrial Organization and Competitive Advantage in Multinational Industries", *The American Economic Review*, Vol. 74, No. 2, pp. 356-360.
- Sullivan, D. (1994), "Measuring the Degree of Internationalization of a Firm", *Journal of International Business Studies*, Vol. 25, No. 2, pp. 325-342.
- Tallman, S. and Li, J. (1996), "Effects of International Diversity and Product Diversity on the Performance of Multinational Firms", *The Academy of Management Journal*, Vol. 39, No. 1, pp. 179-196.
- Tan, D. and Mahoney, T. (2007), "The Dynamics of Japanese Firm Growth in U.S. Industries: The Penrose Effect", *Management International Review*, Vol. 47, No.2, pp. 259-279.

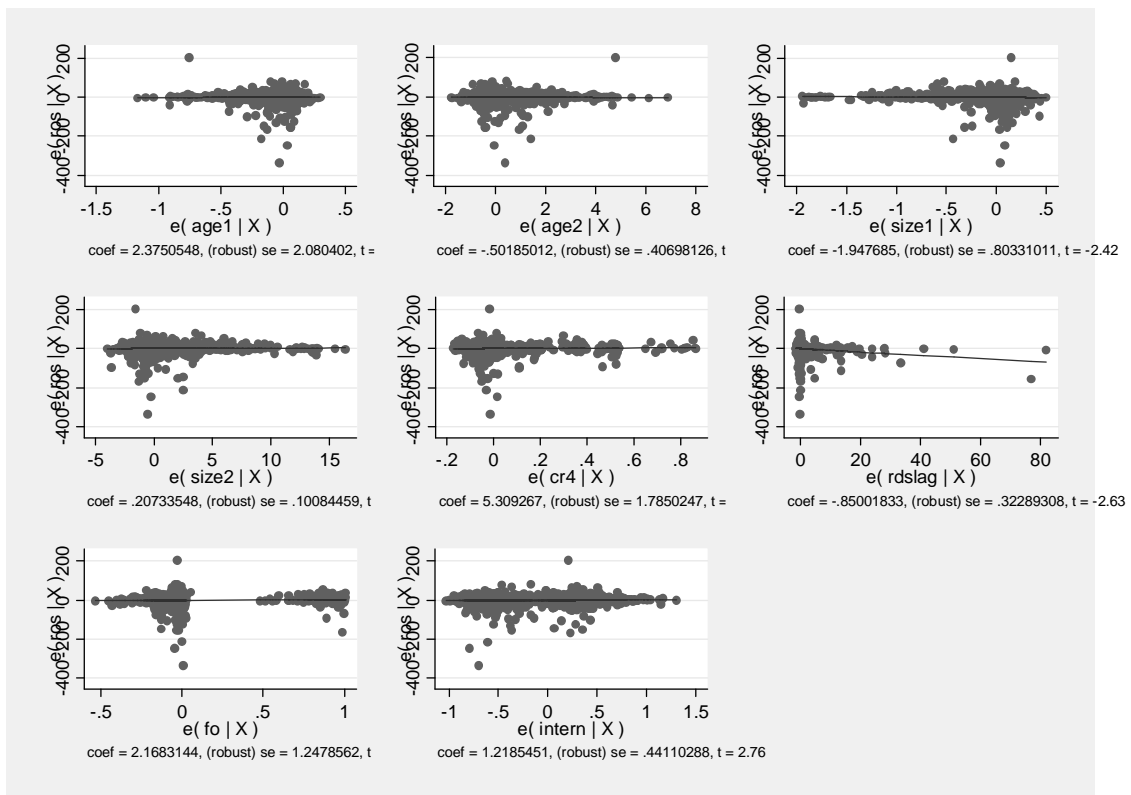
- Tavares-Lehmann, Ana and Teixeira, Aurora, (2007), *Investimento Directo Estrangeiro, Capital Humano e Inovação – uma aplicação ao caso português*, Lisboa: Vida Económica.
- Teece, D. (1985), “Multinational Enterprise, Internal Governance, and Industrial Organization”, *The American Economic Review*, Vol. 75, No.2, pp. 233-238.
- Teece, D. J. (1998),”The Multinational Enterprise: Market Failure and Market Power Considerations”, in *Economic Performance and the Theory of the Firm: The Selected Papers of David Teece*, Vol. 1, London: Edward Elgar Publishing.
- Thomas, D. E. and Eden, L. (2004), “What is the shape of the multinationality-performance relationship?” *Multinational Business Review*, Vol.12, No. 2, pp. 89-110.
- UNCTAD (2007), *World Investment Report*, New York: United Nations.
- Wan, C. (1998), “International diversification, industrial diversification and firm performance of Hong-Kong MNCs”, *Asia Pacific Journal of Management*, Vol. 15, No. 1, pp. 205-217.
- White, H. (1980), “A Heteroscedasticity-consistent Covariance Matrix Estimator and a Direct Test for Heterocedasticity”, *Econometrica*, Vol. 48, No. 4, pp. 149-170.
- Williamson, O.E. (1975), *Markets and Hierarchies*. New York: Free Press.
- Williamson, R. B. (1977), “Multinational versus Local Corporations in LDCs: Comment”, *Southern Economic Journal*, Vol. 43, No. 4, pp. 1612-1615.
- Zaheer, S. (1995), “Overcoming the Liability of Foreignness”, *The Academy of Management Journal*, Vol. 38, No. 2, pp. 341-363.

## Appendix I

Table 13 – PM statistics analyses

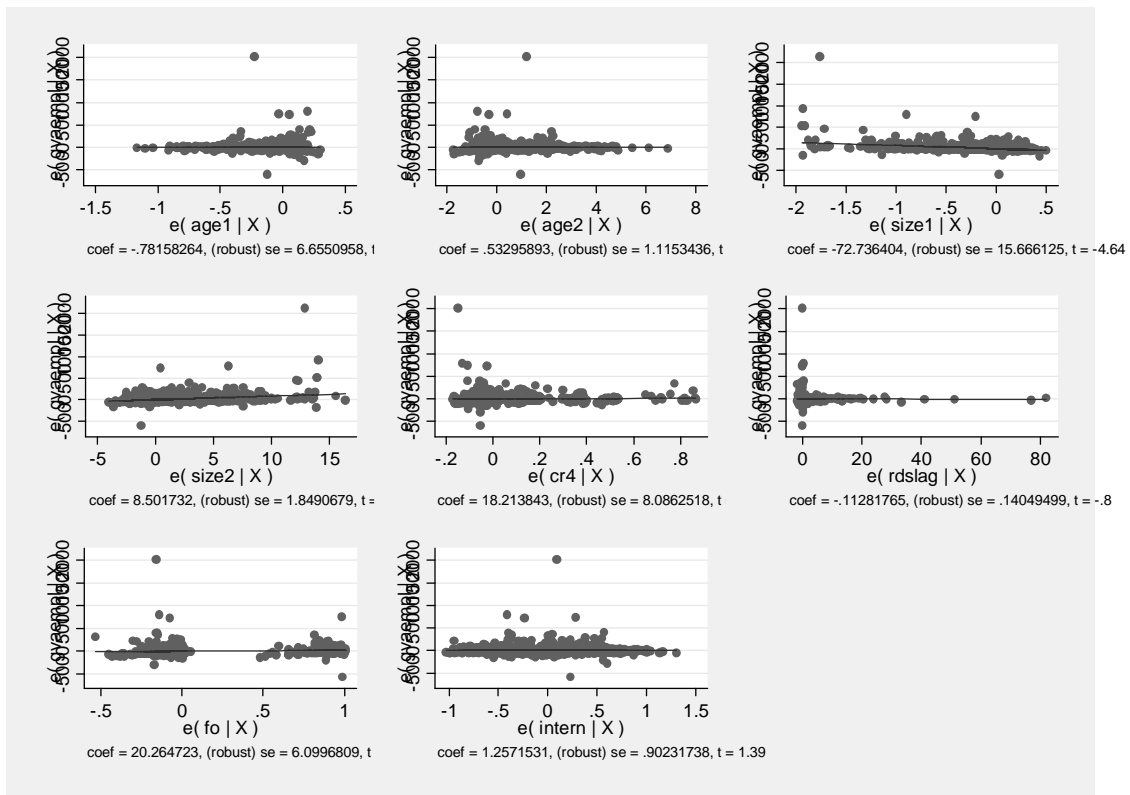


Source: Own elaboration using Stata 10.0

**Table 14 – ROS statistics analyses**

**Source: Own elaboration using Stata 10.0**

**Table 15 - GVAEMPL statistics analyses**



Ourc e: Own elaboration using Stata 10.0