



**Vera Catarina Barros  
Rocha**

**Desempenho e sobrevivência das empresas  
estrangeiras e domésticas durante crises**

**Performance and survival of foreign and domestic  
firms during crises**



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Dissertação apresentada à Universidade de Aveiro para cumprimento dos requisitos necessários à obtenção do grau de Mestre em Economia, realizada sob a orientação científica da Doutora Celeste Maria Dias Amorim Varum, Professora Auxiliar do Departamento de Economia, Gestão e Engenharia Industrial da Universidade de Aveiro e co-orientação científica do Doutor Hélder Manuel Valente da Silva, Professor Auxiliar da Faculdade de Economia da Universidade do Porto.

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## palavras-chave

Crise, Empresas Domésticas, Empresas Estrangeiras, Multinacionalidade, Propriedade Estrangeira, Performance, Sobrevivência

## resumo

A crise económica e financeira global, que atingiu a maior parte dos sistemas económicos regionais e nacionais por todo o mundo no final de 2007, tem alertado para uma maior reflexão sobre o papel desempenhado pelas empresas multinacionais (EMNs) estrangeiras nas economias receptoras. Os governos geralmente encaram o investimento directo estrangeiro (IDE) e a presença das empresas estrangeiras como algo altamente desejável. Contudo, até que ponto é que as actividades das multinacionais estrangeiras contribuem para a gravidade dos efeitos da crise ou, em alternativa, permitem atenuar alguns dos seus piores efeitos, ao reduzirem o volume de despedimentos e as contracções de produção nas economias acolhedoras?

Com base em dados ao nível da empresa da base de dados *Quadros de Pessoal* e num período temporal integrando períodos de estabilidade e de abrandamento económico, a presente dissertação avalia em que medida as subsidiárias estrangeiras apresentaram um comportamento diferenciado face às empresas locais durante os períodos de abrandamento ultrapassados pela economia Portuguesa, com o objectivo de aferir a capacidade potencial das empresas estrangeiras em agirem como elementos estabilizadores ou destabilizadores durante períodos de crise. Em particular, centramos a nossa análise em duas medidas de performance ao nível da empresa (crescimento do emprego e crescimento do volume de negócios), bem como nas perspectivas de sobrevivência e taxas de falência.

Depois de controlarmos por diversas características das empresas e das indústrias, não encontramos diferenças significativas entre as empresas estrangeiras e domésticas no que respeita ao crescimento do emprego, embora os resultados sugiram que a propriedade estrangeira pode ter afectado positivamente a taxa de crescimento do volume de vendas durante as recessões. Relativamente às tendências de sobrevivência, as empresas estrangeiras e domésticas não exibiram diferenças significativas nos padrões de sobrevivência e falência ao longo dos períodos de abrandamento económico.

De um ponto de vista de política, apesar de os nossos resultados não contestarem a opção por políticas centradas na atracção de IDE, a evidência empírica encontrada para Portugal não justifica a escolha de uma política discriminatória a favor das empresas estrangeiras. Os resultados mostram que as EMNs estrangeiras não exercem um efeito destabilizador nas economias acolhedoras. Porém, não existem razões sólidas para esperar ganhos positivos do IDE, nomeadamente no que respeita ao seu papel potenciador na recuperação económica.

**keywords**

Crisis, Domestic Firms, Foreign Firms, Foreign Ownership, Multinationality, Performance, Survival

**abstract**

The global financial and economic crisis, which struck most of the world's national and regional economic systems in the late 2007, has led to calls for further reflection on the role played by multinational enterprises (MNEs) in host economies. Governments commonly seem to view inward foreign direct investment (FDI) and foreign firms' presence as highly desirable. However, in what extent do foreign multinationals' activities contribute to the severity of crisis' effects or otherwise allow to mitigating some of the worst effects, by reducing lay-offs and output contractions in the host countries?

Using firm-level data from *Quadros de Pessoal* database and a time span integrating periods of economic stability and economic downturns, this dissertation evaluates in what extent foreign subsidiaries have behaved differently than local firms during the slowdown periods experienced by Portuguese economy, in order to assess the potential ability of foreign firms to act as stabilizer or disturbing elements during crises. In particular, we focus on two performance measures at the firm-level (employment growth and sales turnover growth) and also on firm survival prospects and failure rates.

After controlling for several firm-level and industry-level characteristics, we find no significant differences between foreign and domestic firms in what concerns employment growth, though the results suggest that foreign ownership may have positively affected firms' sales turnover growth during recessions. Regarding survival trends, foreign and domestic firms did not exhibit different chances of survival and exit throughout economic slowdowns.

For policy, despite our results do not contest the option for active FDI attraction policies, the empirical evidence found for Portugal is not supportive of a discriminatory policy in favour of foreign firms. The results indicate that foreign MNEs do not exert a disturbing effect on host economy. However, there are no strong reasons to expect positive gains from FDI in what concerns its potential recovery-enhancer role.

“ O capital estrangeiro é como o vento: só entra onde tem saída.”

*Albert Hirschman*

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DF – Domestic Firms

EEC – European Economic Community

FDI – Foreign Direct Investment

FF – Foreign Firms

FO – Foreign Ownership

GEP – Gabinete de Estratégia e Planeamento

GMM – Generalized Method of Moments

IB – International Business

IO – Industrial Organization

ISIC - International Standard of Industrial Classification

LE – Large Enterprise

MNE – Multinational Enterprise

MTSS – Ministério do Trabalho e Solidariedade Social

OE – Organizational Ecology

OECD – Organization for Economic Cooperation and Development

OLS – Ordinary Least Squares

PMI – Portuguese Manufacturing Industry

QP – Quadros de Pessoal

ROA – Return on Assets

ROS – Return on Sales

SME – Small and Medium Enterprise

TFP – Total Factor Productivity



## CHAPTER 1

### INTRODUCTION AND PLAN OF THE DISSERTATION

The global financial and economic crisis, which struck most of the world's national and regional economic systems in the late 2007, has led to calls for further reflection on the role played by foreign multinational enterprises (MNEs) in host economies. Governments commonly seem to view inward foreign direct investment (FDI) and foreign firms' presence as highly desirable (Oxelheim and Ghauri, 2004; Markusen and Nesse, 2007). However, in what extent do foreign MNEs' activities contribute to the severity of global economic crisis or otherwise allow to mitigating some of the worst effects, by reducing lay-offs and output contraction in the host countries?

There is a current debate on the role of foreign firms in face of a crisis and their respective impact in host country's economy. Foreign MNEs either can help to alleviate the crisis' effects owing to their well documented ownership advantages and their consequent superior performance, or can add to macroeconomic instability due to the ease with which they can transfer production facilities from one country to another. The empirical evidence on these matters is still scarce, besides their strong focus on the context of the Asian financial crisis and the ambiguous conclusions hitherto achieved.

Throughout this dissertation, based on firm-level data from *Quadros de Pessoal*<sup>1</sup> database, we will attend on how foreign and domestic firms operating in Portuguese manufacturing industries have behaved over a time span of about 20 years, integrating periods of economic stability and also stages of economic downturn. In particular, we will focus on two performance measures at the firm-level (namely, employment growth and sales turnover growth) and also on firm survival prospects and failure rates. Overall, our main aim is to assess in what extent foreign subsidiaries have behaved differently than local firms during the slowdown periods experienced by Portuguese economy during the

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<sup>1</sup> We acknowledge GEP for allowing the use of the original data. The data analysis, results and conclusions are of the author's own responsibility. GEP stands for *Gabinete de Estratégia e Planeamento* from MTSS (*Ministério do Trabalho e da Solidariedade Social* - Ministry of Labour and Social Solidarity).

early 1990s and 2000s, in order to evaluate the potential ability of foreign firms to act as stabilizer or disturbing elements during crises. Accordingly, we attend on the effect arising from foreign ownership upon firm performance and firm survival during periods of economic slowdown, also attending on other factors which are likely to discriminate among firms, namely firms' characteristics (in particular, firm size) and the industries' specificities.

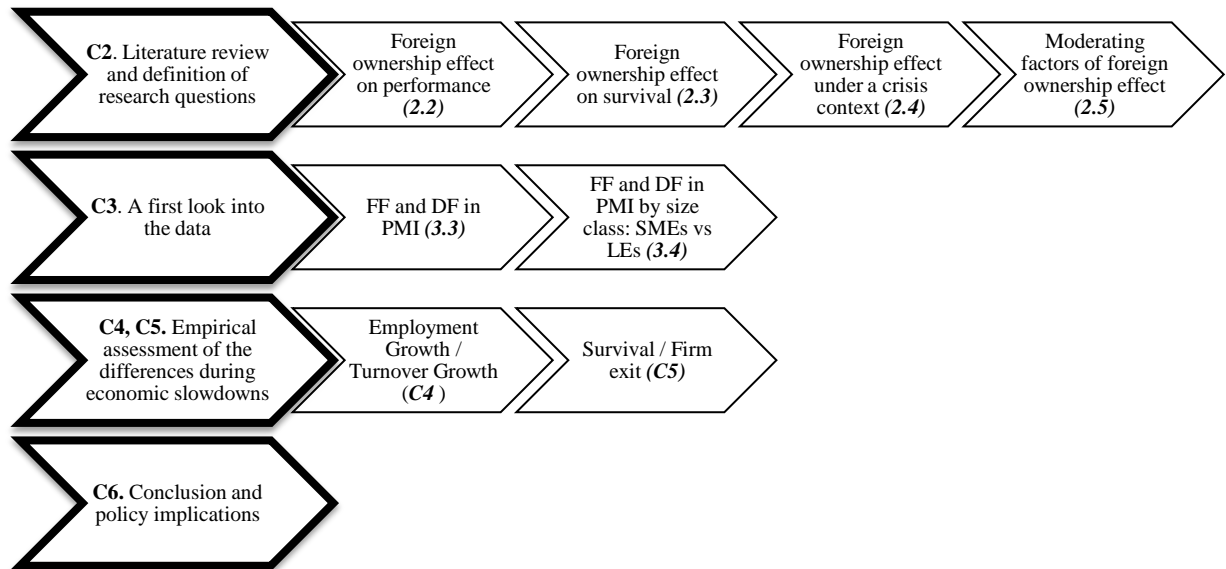
Figure 1 depicts the content of the remainder chapters of this dissertation. After this first introduction, we will start with a deep survey of the main literature on these matters throughout Chapter 2. We initiate the discussion by reviewing the comparative studies between foreign and domestic firms searching for significant differences at performance and survival. Accordingly, section 2.2 surveys the empirical results for the foreign ownership- firm performance link, while section 2.3 focuses on the empirical findings for the relationship between foreign ownership and firm survival. These first sections help to support the expectation of a different behaviour among foreign and domestic firms under a crisis environment, so that section 2.4 deals with the available empirical studies searching for a potential singular role played by foreign MNEs operating in host countries, either during or after a crisis event. Finally, section 2.5 discusses some likely moderating factors of foreign ownership effect under crises. Besides foreign MNEs' motivations and crisis' specificities, we focus on firm-level and industry-level characteristics where foreign and domestic firms are commonly found to differ, specially attending on the moderating impact arising from firm size. After this in-depth literature review, we derive our research questions, which will be empirically addressed in the subsequent chapters.

Chapter 3 provides a first look into the data. We start by presenting the empirical setting used to assess our main research questions, followed by an assessment of foreign and domestic firms' evolution in Portuguese manufacturing industry, particularly looking at differences at entry patterns, size and scale, operational performance, human capital levels and geographical location. In addition, the evolution patterns of foreign and domestic firms of different size classes is also discussed, in order to assess whether, unconditionally, substantial differences arise from the comparisons between the diverse groups of firms.



In Chapters 4 and 5 we empirically assess the differences between foreign and domestic firms during economic slowdowns, in what concerns their performance/growth patterns and exit risks. Precisely, in Chapter 4, we use panel data models to appraise in what extent foreign and domestic firms have behaved differently at employment growth and sales turnover growth<sup>2</sup>. In Chapter 5, we draw on duration models and time-to-event data to perform a survival analysis, aiming to evaluate the significance of *foreignness* for firm exit during recessions. Lastly, Chapter 6 concludes by summing up the results of this study, discussing as well their implications from a policy point of view.

**Figure 1.** Outline integrating the content of the dissertation



On the whole, we find no significant differences between foreign and domestic firms in what concerns employment growth, though the results suggest that foreign ownership may have positively affected firms' sales turnover growth during recessions. Regarding survival trends, after controlling for several characteristics of firms and industries, we find that foreign firms exhibit higher failure rates over the time, although during recessions foreign and domestic firms do not exhibit different chances of survival and exit.

<sup>2</sup> Employment growth and sales turnover growth are frequently used as measures of firm growth and firm performance. Turnover and sales are frequently used interchangeably in the literature (Coad, 2009; Bamiatzi, Bozos and Nikolopoulos, 2010).

To the best of our knowledge, this is the first in-depth empirical study of this issue using a long time span of micro data for Portugal, a country with great challenges for convergence and with an active policy towards inward FDI. Accordingly, this study contributes to the existing literature on foreign firms' role during crises by providing as well novel empirical evidence on the Portuguese experience. Furthermore, this study connects the main contributes of the literature on International Business (IB), Industrial Organization (IO) and Organizational Ecology (OE) over the recent years, with a current and timely debated setting of global economic crisis, which contributes to the originality of this research.

## CHAPTER 2

### LITERATURE REVIEW AND DEFINITION OF THE RESEARCH QUESTIONS

#### 2.1. INITIAL CONSIDERATIONS

To what extent do foreign firms' activities contribute to the severity of global economic crisis or otherwise allow to mitigating some of the worst effects, by reducing lay-offs and output contraction in the host countries? Foreign MNEs are said to possess firm-specific advantages which make them able to surpass their liability of foreignness (Zaheer, 1995) and to outperform their domestic counterparts in the host economy (Hymer, 1976; Dunning and Lundan, 2008; Caves, 1996). Their well documented ownership-specific advantages (Dunning, 1988), which include financial advantages, knowledge advantages and other advantages acquired from multinationality, often shift the changes of firm-level performance, growth, survival and exit. Foreign firms seem thus to be in a better position to compete and to face the obstacles in the market, which lead us to the expectation of a potential different behaviour among foreign and domestic firms during a crisis. Accordingly, the next two sections of this chapter will, respectively, survey the literature on the differences between foreign and domestic firms concerning several performance measures and survival patterns, thus highlighting the mixed results hitherto obtained for the relationship between foreign ownership, firm performance and firm survival.

However, under a crisis context, we still know little about these relationships, as the results provided by the literature lead us to doubt whether under a crisis environment foreign MNEs are affected or react differently than domestic firms. Foreign MNEs can help to alleviate the crisis' effects owing to their specific advantages, which provide them the ability to easily access the needed resources, to use internal capital markets when faced with financial constraints or to obtain overseas credit through their parent companies, which allows them to expand their economic activity even in turbulent periods (Desai et al., 2004; Blalock et al., 2005; Chung and Beamish, 2005a, 2005b), and thus stabilize the

economy. On the other hand, foreign firms may react more adversely to crises as it is easier for them to transfer production facilities internationally (Görg and Strobl, 2003; Lee and Makhija, 2009), to cut operational costs (Gao and Eshaghoff, 2004), to replace their sales in host countries by higher levels of exports (Lipsev, 2001), or in the limit, to exit the local economy if the host market and/or production conditions are less attractive (Álvarez and Görg, 2009).

For this reason, section 2.4 reviews the empirical studies searching for a potential (un)stabilizer role played by foreign firms under a crisis environment, where firm performance measures and firm survival are over again emphasized. An important detail refers to the fact that available firm-level studies have dealt with firms' responses and evolution either during crises or after crises. However, it is important to distinguish firms' behaviour during and after a crisis event, since very different results may be obtained conditional on a short-term or medium/longer-term analysis, as the survey of literature shows.

Finally, some moderating factors likely to interfere with the foreign ownership effect under crises have also been suggested by some authors in the literature. In fact, the way foreign firms behave under a crisis context may depend on several specificities as foreign MNEs' motivations and a number of firm-level characteristics. Accordingly, section 2.5 will discuss some of the main factors likely to moderate the impact of being foreign-owned during a crisis, particularly attending on the main characteristics where foreign and domestic firms more often differ and thus may contribute to a distinct behaviour during slowdowns. Additionally, we also pay a special attention to firm size as a moderating factor able to explain what happens to firms over periods of deep economic crises. At last, in section 2.6 we conclude, by defining our research questions.

Overall, this dissertation integrates the most important contributes given by different strands of the literature, namely the Organizational Ecology and Industrial Organization with those of International Business and the theory of multinational enterprise (MNE). Moreover, we establish a connection between those contributes and a current setting of global economic crisis and thus try to provide a novel contribute to the several branches of the literature on these matters.

## 2.2. FIRM PERFORMANCE: DOES FOREIGN OWNERSHIP MATTER?

The FDI literature has early established that a reason why firms invest abroad is because they possess firm-specific advantages, not available to domestic firms in the host country (Vernon, 1966; Hymer, 1976; Dunning, 1981; Caves, 1974). These ownership advantages and firm-specific assets, as better access to financial markets and superior managerial practices, very often assist foreign MNEs to achieve a differentiated behaviour and to be better performers than purely domestic firms.

There are two main theoretical approaches that are important to explain performance differences between firms – Industrial Organization, a neoclassical perspective based on industry's characteristics and firm's specificities, and International Business, a more evolutionary theory based on arguments as ownership-advantages, location factors and incentives for internalization of some activities by foreign firms. Both viewpoints are crucial for understanding firm performance and why foreign firms may differ from domestic ones at performance and growth. Accordingly, there are strong reasons to expect that foreign ownership matters for firm dynamics.

Along with the literature review conducted by Bellak (2004a) on the importance of performance gaps for economic policy, a part of the impact of inward FDI on the host economy depends on the existence of performance gaps between foreign firms and their domestic counterparts. Actually, the more similar the firms, the smaller will be the potential spillovers arising from foreign presence. On the other hand, if gaps are very large, such externalities arise to a small extent, especially if local firms lack the required absorptive capacity to learn the best practices of foreign firms (Bloömstrom and Kokko, 1998; Pfaffermayr and Bellak, 2002; Görg and Greenaway, 2003). For that reason, the role of foreign ownership and “multinationality” in explaining the differences between foreign and domestic firms at performance levels has been occupying a significant body of IB and FDI literature over the recent years. However, the empirical evidence is not conclusive – several studies demonstrate that foreign affiliates perform better than domestic enterprises (e.g., Kimura and Kiyota, 2007), while many others prove that such gap is a statistical artefact and that the relationship between foreign ownership and firm performance is spurious (e.g., Pfaffermayr and Bellak, 2002) or even negative (e.g., Luo and Tan, 1998).

Table 1 summarizes the results of about 30 empirical studies on the link between foreign ownership and firm performance, reflecting the mixed evidence found in the literature.

### *2.2.1. FOREIGN OWNERSHIP AS A POSITIVE FACTOR FOR FIRM PERFORMANCE*

Willmore (1992) has early concerned with the significance of performance gaps between foreign and domestic firms in Brazil. By focusing on firm performance at exports, his study applied to more than 17.000 manufacturing firms concluded that foreign-owned exporters registered on average 65% more exports than otherwise comparable domestically-owned firms. Moreover, foreign firms in Brazil were found to be typically larger, skill intensive and paying 40% higher wages per employee. Similar conclusions were attained by Cabral (1996) for the Portuguese setting, where foreign firms are known to be highly export-oriented, relatively larger and good performers, and by Farinha and Mata (1996), who found that the effect of foreign ownership upon firm performance was clearly positive, not only concerning the value creation, but also for the job creation process in the long run. More recently, Cardoso (2008) focused on the top largest firms and corroborated the previous evidence for Portugal, showing that foreign and domestic firms differ at comparative performance, even according to different performance measures.

For many other European countries there is strong evidence of a positive link between foreign ownership and firm performance. For Austria, Gugler (1998) used a sample of 600 largest non-financial corporations to show that foreign firms presented a rate of return of 10.4%, which was significantly higher than the overall median of 8.4%. Empirical evidence for UK was enriched by the studies of Oulton (1998a, 1998b) and Griffith and Simpson (2001), who analyzed different performance proxies and both the manufacturing (Oulton, 1998a; Griffith and Simpson, 2001) and the services sectors (Oulton, 1998b). The performance gaps remained even after controlling for structural differences between firms, which confirmed the role of multinationality in explaining the firms' dynamics.

For Ireland, Görg and Strobl (2003a) tested the significance of foreign control upon employment persistence and showed, in line with Farinha and Mata (1996), that jobs generated in surviving foreign firms are more persistent than jobs created in indigenous

firms. Employment growth was also found to be greater and more secure within foreign firms by Özler and Taymaz (2004) and Girma and Gong (2008), in Turkey and China respectively, where foreign ownership seems to be understood as an important tool to generate jobs.

In Asia, domestic firms also seem to be in disadvantage against foreign MNEs' affiliates. Ramstetter's (1999) study shows that the average productivity of labour and export propensities are often higher in foreign MNEs than in local firms operating in Hong Kong, Indonesia, Malaysia, Singapore and Taiwan. Blomstroöm and Sjöholm (1999) and Chhibber and Majumdar (1999) used in turn the empirical settings of Indonesia and India respectively to test whether firm performance measures depended on different levels of foreign ownership. Both agreed with foreign firms' superiority at all levels, but while the formers showed that foreign affiliates had better performance whatever their degree of foreign control, the last found that only firms with foreign participation above 50% benefited from a "performance bonus".

The superiority of foreign-owned firms in China, either at sales levels, productivity or profitability was particularly discussed by Hallward-Driemeier et al. (2006) and Girma and Gong (2008). Over again, foreign ownership was found to have strong positive effects on firm performance, being more than a summary of superior characteristics and ownership advantages. This general scenario observed around the world was also translated by the study of Criscuolo (2005) applied to OECD countries. By comparing the labour productivity among foreign and domestic firms over the late 1990s, the study concludes that foreign affiliates tend to outperform their domestic counterparts, particularly in manufacturing industries, where they tend to concentrate in high technology and high value added industries. This and the previous empirical contributes have thus shown that, after controlling for differences in industrial distribution of foreign and domestic firms, as well as firm-level specificities, the performance differences persist between the two groups of firms, with foreign-owned firm outperforming domestic ones. Hence, a significant branch of the literature supports the idea that foreign ownership significantly matters for firm growth and performance.

**Table 1.** Empirical evidence on the foreign ownership impact upon firm performance

Reference*	Country [Period]	Performance Measure	Methodology	FO impact on firm performance
Kumar (1984)	UK [1968-1976]	Profitability (average 1972-1976)	OLS	-
		Firm Growth (average 1972-1976)	OLS	n.s.
Kim & Lyn (1990)	USA [1980-1984]	Profitability	Univariate Analysis and MAXR procedure	-
Willmore (1992)	Brazil [1980]	Export Performance	Cross-section regression	+
Cabral (1996)	Portugal [1986-1992]	Export Performance	Tobit	+
Farinha & Mata (1996)	Portugal [1982-1992]	Value added per employee and employment persistence	Random-effects panel data estimations	+
		Price-Cost Margin	Random-effects panel data estimations	-
Doms & Jensen (1998)	USA [1987]	Value added, TFP, wages, Capital intensity	Cross-section regression	+
Gugler (1998)	Austria [1996]	Rate of Return and Profitability	OLS, Descriptive Statistics and Data Analysis	+
Luo & Tan (1998)	China [1994]	Return on Sales and Return on Assets	Multiple Regression and Canonical Analysis	-
Oulton (1998a)	UK [1973-1993]	Gross and Net Output, Value Added	Cross-section regressions and Panel data models	+
Oulton (1998b)	UK [1995]	Productivity	Cross-section regression	+
Blomström & Sjöholm (1999)	Indonesia [1991]	Labor Productivity	Cross-section regression	+
Chhibber & Majumdar (1999)	India [before and after 1991]	Return on Sales and Return on Assets	Cross-section regression	+
Ramstetter (1999)	Asia [1970-1996]	Value added per plant	T-test statistics	+
Matalony (2000)	USA [1992]	Return on Assets	Univariate Regression; Descriptive Statistics	-
Griffith & Simpson (2001)	UK [1980-1996]	Value added per worker	Panel data models	+
Pfaffermayr & Bellak (2002)	Austria [1997/2000]	Labor productivity, Investment propensity and cash-flows	Probit and Ordered Probit	n.s.
Görg & Strobl (2003a)	Ireland [1973-1996]	Employment Persistence	Cox Proportional Hazard Model	+
Özler & Taymaz (2004)	Turkey [1983-1996]	Employment Growth	Tobit	+
Barbosa & Louri (2005)	Portugal [1992] and Greece [1997]	Return on Assets (both net and gross)	Quantile Regression	n.s.
Criscuolo (2005)	OECD [1995-2001]	Labor Productivity	Descriptive Statistics and Data analysis	+
Benfratello & Sembenelli (2006)	Italy [1992-1999]	TFP	GMM	n.s.
Hallward-Driemeier, Wallsten & Xu (2006)	China [2000]	Sales growth, investment rate, TFP and employment growth	Cross-section regression	+
Xu, Pan, Wu & Yim (2006)	China [1998/2002]	Profit, Sales, Assets, ROA, ROS	Multiple-way ANOVA	n.s.
Aydin, Sayim & Yalama (2007)	Turkey [2003/2004]	Return on Assets	T-test statistics	+
		Operating Profit Margin	T-test statistics	n.s.
		Return on Equity	T-test statistics	n.s.
Kimura & Kiyota (2007)	Japan [1994-1998]	Return on Assets, Return on Equity, Value added and TFP	Probit	+
Móden, Norbäck & Persson (2007)	Poland [1995-2000]	Labor Productivity	Panel data models	+
Cardoso (2008)	Portugal [2006]	Profit Rate, Return on Sales and Value Added per employee	Cross-section regression; Quantile Regression	+
Girma & Gong (2008)	China [1999-2005]	Employment Growth, TFP and Profitability	Fixed effects GMM estimation	+
Karlsson, Lundin, Sjöholm & He (2009)	China [1998-2004]	Employment Growth	Panel data models; Heckman 2-step estimations	n.s.

(+) means that foreign firms perform better than domestic firms; (-) means that foreign firms perform worse than domestic firms; (n.s. = not significant) means that being foreign-owned does not matter for firm performance, thus no significant performance gaps exist between foreign and domestic firms.

**Source:** Own elaboration, \*Studies are presented in a chronological order.



### *2.2.2. FOREIGN OWNERSHIP AS A NEGATIVE FACTOR FOR FIRM PERFORMANCE*

Despite a large branch of literature sustains that foreign-owned firms are significantly better performers than domestic firms at several levels, conflicting results were early presented and discussed in IB research. As an example, Kumar (1984) used the British experience to evaluate whether firms with overseas production significantly differed from those with only domestic operations. By selecting a sample of 700 UK firms, the conclusions contested the superiority of foreign subsidiaries commonly found in many comparable studies. Indeed, the degree of overseas operations seemed not to have any relevant influence upon firms' growth, still exerting a negative impact on profit rates and investment levels. Likewise, for USA, Kim and Lyn's (1990) results indicated that foreign firms operating in US markets were less profitable than randomly selected domestic firms, presenting also higher debt levels over the early 1980s. Confirming these results, Matalony (2000) advanced as well that profitability is one firm-level characteristic where foreign firms usually perform worse than domestic firms, after an assessment of the return on assets of over than 2.000 firms.

Very similar outcomes were obtained for other economies, like China and Portugal. Luo and Tan (1998) surveyed about 50 firms operating in Chinese electronics industry and showed that the environmental complexity and hostility, beside the risk-taking attitude of foreign affiliates, tend to justify their lower profitability and smaller returns, which validates the perspective of liability of foreignness in MNE theory (e.g. Hennart, 1982; Zaheer, 1995). For the Portuguese case, Farinha and Mata (1996) also highlight the foreign disadvantage at price-cost margins, balancing the foreign advantage already stated in the previous section, namely at value added and employment persistence.

### *2.2.3. FOREIGN OWNERSHIP AS A NEUTRAL FACTOR FOR FIRM PERFORMANCE*

Despite the conflicting results previously discussed, a third alternative conclusion may also be achieved, since the foreign ownership effect may arise from foreign firms' superiority at several firm-level and industry-level characteristics. Xu et al. (2006) revisited the Chinese case and showed that foreign-invested enterprises are not necessarily

better performers than domestic firms, not only in what concerns their profitability and returns, but also at sales levels and assets' value. Karlsson et al. (2009) go far within the Chinese context and prove that no significant differences arise between foreign and domestic firms at employment growth rates. Sustained by a large firm-level dataset for the period 1998-2004, the authors reveal that no pure ownership effect exists associated with foreign capital but, rather, other firm-level characteristics explain firm performance, as firm size, export shares, labour productivity, average wages and capital intensity.

Benfratello and Sembenelli's (2006) outcomes on the Italian case confirmed as well that foreign ownership *per se* does not matter for firm's productivity, but that the country of origin possibly matters, given that only firms under US ownership were found to be more productive than other comparable enterprises of different nationalities<sup>3</sup>. For Turkey, Aydin et al. (2007) establish that foreign performance only differ from domestic one at return-on-assets (ROA), being thus equivalent in what concerns the operating profit margin and returns on equity.

For Portugal and Greece, joining the opposite outcomes provided by Farinha and Mata (1996) and Cardoso (2008) on the Portuguese case, Barbosa and Louri (2005) evaluated the importance of foreign ownership for corporate performance. The results reject the hypothesis of foreign superiority, given that ownership ties did not make a significant difference on firm performance, especially in Portugal. For Greece, only foreign MNEs in the upper quantiles of gross profits were found to perform better than domestic firms.

In summary, the evidence about performance gaps between foreign and domestic firms is far from conclusive. However, governments around the world still focus their policies aiming to attract foreign presence expecting that such a gap lead to numerous benefits for host economies and for local firms (e.g., Oxelheim and Ghauri, 2004; Lim, 2005; Markusen and Nesse, 2007), without being sure if foreign ownership accounts in some extent for potential performance gaps observed between firms. This question gains increased importance under a crisis context, especially if there is a potential stabilizer role to be exerted by the best performers. As a result, deeper understanding on the role of foreign ownership upon firms' evolution is needed, in order to discern if foreign control

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<sup>3</sup> Curiously, Doms and Jensen (1998) had already stated that nationality might be a potential explanatory factor of firm performance, provided that within foreign-owned firms, they found that US firms tend to differ from the other foreign affiliates, often presenting even better evolutions.

may somewhat explain the way firms evolve and develop over the time and under different macroeconomic environments. If foreign ownership really matters for corporate performance and thus foreign firms present a consistent superior behavior compared to local firms, we might expect that during problematic periods, when host economies suffer economic breakdowns, foreign MNEs' superiority helps to leverage the local upturn.

### **2.3. FIRM SURVIVAL: DOES FOREIGN OWNERSHIP MATTER?**

Post-entry growth and life duration of firms has been occupying a large body of the IO and OE literature, mainly over the last two decades (van Geenhuizen and Nijkamp, 1994; Mata and Portugal, 2004; Lin and Huang, 2008). Several firm-specific, industry-specific and macroeconomic variables have been largely debated by researchers as important determinants for the life span of firms in general<sup>4</sup>. The link between foreign ownership and the survival of firms is an important topic that has emerged in more recent studies on firm survival. However, while there have been several studies of the survival of foreign subsidiaries (e.g., Li, 1995; Delios and Beamish, 2001; Dhanaraj and Beamish, 2004), only a few have compared the survival of foreign and domestic firms (Bernard and Sjöholm, 2003<sup>5</sup>; Kronborg and Thomsen, 2009). Moreover, there is not a consensus about which type of firms survive longer – foreign-owned or domestic-owned firms – so that the knowledge of the determinants of foreign firms' lifetimes, as well as the dissimilarities on life expectations between foreign and domestic firms, are issues likely to be of great value to host governments, which have been strongly attracting foreign investments without paying attention to such details. Governments of host countries should know what type of firm is more prone to death, with the aim of establish the most adequate measures in order to avoid job losses and market shakeouts. This question, likewise to performance gaps between foreign and domestic firms, gains even more relevance under a context of crisis.

There are several arguments that make us expect that foreign ownership matters for firm survival, though no clear suppositions can be made regarding the direction of the foreignness effect. On the one hand, it is suggested that foreign firms are “footloose”,

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<sup>4</sup> In chapter 5 we will discuss the main firm-level and industry-level variables likely to affect the survival of firms, according to the literature. For a comprehensive survey of empirical evidence on firm survival, see, for instance, Manjón-Antolín and Arauzo-Carod (2008).

<sup>5</sup> Bernard and Sjöholm (2003) also highlight that this *gap* in the literature is found not only for the case of developing countries, but also for developed countries.

because they can be less rooted in local economy and thus easily re-allocate their resources to other countries as a reaction to adverse changes in the host country (Bernard and Sjöholm, 2003; Görg and Strobl 2003a, 2003b; Taymaz and Özler, 2007; Van Beveren, 2007). In other words, foreign firms may have lower exit costs that make exit probability higher. Besides this, investing abroad is usually a risky deal, as foreign MNEs may have knowledge disadvantages about local market, which increases their well known *liability of foreignness*, which impacts negatively on their survival prospects (Zaheer and Mosakowski, 1997).

On the other hand, foreign affiliates may be less likely to exit because investing abroad involves substantial sunk costs which are likely to be higher than for setting up a purely domestic firm in the host country (Álvarez and Görg, 2009). Additionally, foreign firms have, on average, superior technological and managerial skills, as well as valuable connections with other firms, which enable them to develop successful entry strategies and a stable post-entry growth (Audretsch and Mahmood, 1994; Mata and Portugal, 2004). However, the survival differences between foreign and domestic firms may actually arise from their different characteristics, and if that is the case, it may happen that anything is left to the foreignness *per se* (Mata and Portugal, 2002; Holmes et al., 2010), so that the relationship between firm survival and foreign ownership is actually neutral.

In view of that, this section reviews the results of the main empirical studies of the last two decades about the differences on survival patterns among firms under foreign and domestic control. According to their mixed outcomes, these studies can be grouped in three broad groups: 1) those that found a *survival bonus* belonging to foreign firms; 2) those that found a *survival bonus* belonging to domestic firms; and 3) those showing that no difference exists between foreign and domestic firms' survival patterns. Table 2 presents a synopsis of this literature.

### 2.3.1. FOREIGN OWNERSHIP AS A POSITIVE FACTOR FOR FIRM SURVIVAL

The US case was early explored in the seminal studies of Li and Guisinger (1991) and Audretsch and Mahmood (1994). Li and Guisinger's (1991) results have shown that the business failure rate of foreign-controlled firms is significantly lower than the failure

rate of domestic firms, both in aggregate and also by major industry groups, which somewhat confirms the Dunning's (1988) hypothesis on MNEs' ownership advantages. Subsequently, Audretsch and Mahmood (1994) showed, with data on over than 12.000 US manufacturing establishments, that the structure of ownership affects the survival prospects, since being a subsidiary of a multi-establishment firm impacts positively on firm's life expectancy.

For developing countries like Indonesia, Behrman and Deolalikar's (1989) study was one of the first contributes confirming that establishments with higher survival durations are those with larger foreign shares. Actually, their results precise that a 10% larger share held by foreigners would be equal to about five additional years in firm age. More recently, Narjoko and Hill (2007) revisited the Indonesian context and established that foreign ownership is a positive factor for a better evolution of firms, especially under a crisis environment, when foreign control seems to be vital for firms' resilience, adjustment and recovery.

The superiority of foreign firms in terms of survival was also stated by Bridges and Guariglia (2008), who studied the survival patterns of globally engaged firms and purely domestic companies operating in UK. They justify the higher failure probabilities found for domestically-owned firms with their lower collateral and higher leverage, leading them to the financial constraints that, conversely, foreign firms rarely face. Using similar arguments, Helmers and Rogers (2008) also state that foreign-owned firms operating in British manufacturing during the early 2000s were less likely to exit, compared with the financially struggled domestic firms. On the other hand, Holmes et al. (2010) conclude that only local SMEs are less likely to survive than firms that are initially foreign-owned, whereas the nature of ownership is found to be insignificant among micro-enterprises.

Many other empirical settings have been used to test the importance of foreign ownership for firm survival. For instance, Bonn (2000) chooses the Australian framework to explore the characteristics of long-term survival and to demonstrate that survivors during the period 1982-1993 were predominantly foreign-owned firms, which indicates that managers of domestic companies must be aware of their greater vulnerability compared with MNEs' affiliates. For Taiwan, Aw (2002) expresses that firms with foreign investments were found to be about 23% more likely to survive than purely domestic

firms. For Portugal, Mata and Portugal (2004) provide a simple comparison of survival patterns of domestic and foreign entrants and conclude that domestic firms face higher rates of exit than foreign ones and that, among these, greenfield entrants confront higher rates of exit than those entering by acquisition. The Chinese case was explored by Girma and Gong (2008), who confirmed the previous evidence on foreign advantage, over again justified by the ability of foreign affiliates to access to financial sources.

A broader analysis on this matter is provided by Geishecker et al. (2008) for the Euro Area. Unconditionally, Euro Area MNEs exhibit higher survival rates than indigenous firms, in addition to a “performance premium” and a larger scale of operations which increase their relative importance at value added, employment and sales turnover. Instead, Kronborg and Thomsen (2009) focused on Denmark to explore the link between foreign ownership and long-term survival. By using 528 pairs of companies (foreign- and domestic-owned) over a 110-year period, they reveal that there is a statistically and economically significant “survival premium” attributed to foreign firms, though such premium declines over time and tend to disappear by the end of the period analyzed.

In conclusion, ownership-specific advantages (Dunning, 1988), which include financial advantages, knowledge advantages and advantages acquired from multinationality, shift the changes of exit and survival. Foreign firms seem thus to be in better position to compete and to face the obstacles in the market. However, the longer survival durations associated with foreign ownership may also be a function of foreign firms’ larger size at establishment-level, rather than ownership alone.

### *2.3.2. FOREIGN OWNERSHIP AS A NEGATIVE FACTOR FOR FIRM SURVIVAL*

Conflicting results about the potential life-enhancing effect arising from foreign ownership were mainly found during the last decade, as Table 2 confirms. The studies of Görg and Strobl (2000, 2003a, 2003b) for Ireland, Bernard and Sjöholm (2003) for Indonesia and Bernard and Jensen (2007) for USA, are strong supporters of the MNEs’ footloose behavior hypothesis. In fact, after controlling for firms’ and industries’ characteristics, foreign firms were found to have higher failure rates than domestic firms. A possible explanation for such dynamic relies on the ease with which foreign firms

transfer production facilities from one country to another (Görg and Strobl, 2000, 2003a, 2003b) or the extensive use by MNEs of the margin available to close their plants more often than their domestic equivalents (Bernard and Sjöholm, 2003).

Other authors highlight the liability of foreignness as an explanatory factor of foreign firms' higher hazards. Zaheer and Mosakowski (1997) provide a deep analysis of foreign and domestic counterparts in the banking industry and reveal that foreign firms have a lower chance of survival, although the effect of foreignness on the survival rate is non-linear, more precisely, inverted-U shaped. According to their results, it takes over 15 years to "level the playing field" between foreign and domestic firms, which means that foreign affiliates must, at least initially, possess some superior source of competitive advantage over local firms, in order to compensate their liability of foreignness.

More generalist studies searching for the determinants of survival of manufacturing firms have also found that foreign ownership matters. Baldwin and Gu (2004) for Canada and Pérez et al. (2004, 2010) and Ortega-Argilés and Moreno (2005) both for Spain and Kimura and Kiyota (2006) for Japan have showed that firms with foreign capital participation bear a notorious higher risk of exit. These results are justified with the high financial and managerial burdens implied by foreign investments, for example due to the higher tariffs and other taxes that foreign firms must pay.

The most recent contributes have been studying very different countries around the world and keep on promoting the debate and the discussion about the potential impact of foreign ownership upon firm survival. Van Beveran (2007) tested the MNEs' footloose behavior hypothesis for Belgium and has confirmed that after controlling for the fact that foreign MNEs are on average larger, more productive and pay higher wages, foreign-owned firms are found to be more likely to exit than domestic firms, both in manufacturing and services. The author highlights the importance of such result for policy makers, who must rethink the desirability of the large impact of foreign firms on host economy. For the Dutch case, Fertala (2008) provides evidence on foreign firms' higher risk of failure, mainly arising from the well documented liability of foreignness. Finally, Álvarez and Görg (2009) and Bandick and Görg (2009) have corroborated the previous results for Chile and Sweden, respectively. However, Álvarez and Görg (2009) underline that only domestic-market oriented MNEs are more footloose, a result that is not obtained for multinational exporters, which are more likely to survive than domestic companies.

**Table 2.** Empirical evidence on the foreign ownership impact upon firm survival

Reference*	Country [Period]	Methodology	FO impact on firm survival
Behrman & Deolalikar (1989)	Indonesia [1975-1985]	Tobit model	+
Li & Guisinger (1991)	USA [1978-1988]	Bivariate Analysis	+
Audretsch & Mahmood (1994)	USA [1976-1986]	Semi-Parametric Cox Proportional Hazard Model	+
Zaheer & Mosakowski (1997)	47 countries [1974-1993]	Cox Proportional Hazard Model	-
Mata & Portugal (1999, 2002)	Portugal [1983-1989]	Competing-Risks Model, Semi-Parametric Discrete Hazards Model, Descriptive Statistics	n.s.
Bonn (2000)	Australia [1982-1993]	Logit model	+
Görg & Strobl (2000, 2003a, 2003b)	Ireland [1973-1996]	Cox Proportional Hazard Model	-
Aw (2002)	Taiwan [1986-1991]	Probit model	+
Bernard & Sjöholm (2003)	Indonesia [1975-1989]	Semi-Parametric Cox Proportional Hazard Model	-
Kimura & Fujii (2003)	Japan [1994-1999]	Cox Proportional Hazard Model	n.s.
Baldwin & Gu (2004)	Canada [1989-1991]	Probit; Ordered Probit; Heckman 2-step estimations	-
Mata & Portugal (2004)	Portugal [1983-1989]	Logit model	+
Özler & Taymaz (2004)	Turkey [1983-1996]	Cox Proportional Hazard Model	n.s.
Pérez, Llopis & Llopis (2004, 2010)	Spain [1990-1999, 1990-2000]	Cox Proportional Hazard Model	-
Ortega-Argilés & Moreno (2005)	Spain [1990-2001]	Cox Proportional Hazard Model	-
Kimura & Kiyota (2006)	Japan [1994-2000]	Cox Proportional Hazard Model	-
Bernard & Jensen (2007)	USA [1987-1997]	Probit model	-
Kimura & Kiyota (2007)	Japan [1994-1998]	Probit model with random effects	n.s.
Narjoko & Hill (2007)	Indonesia [1993-2000]	Probit model	+
Taymaz & Özler (2007)	Turkey [1983-2001]	Cox Proportional Hazard Model	n.s.
Van Beveren (2007)	Belgium [1996-2001]	Cox Proportional Hazard Model	-
Bridges & Guariglia (2008)	UK [1997-2002]	Logit and Cox Proportional Hazard Model	+
Fertala (2008)	Germany [1997-2004]	Gompertz-Makeham Hazard Model	-
Geishecker, Görg and Taglioni (2008)	Euro Area [2000-2004]	Descriptive Statistics	+
Girma & Gong (2008)	China [1999-2005]	Cox Proportional Hazard Model	+
Helmers & Rogers (2008)	UK [2001-2005]	Cox Proportional Hazard Model	+
Álvarez & Görg (2009)	Chile [1990-2000]	Probit model	-
Bandick & Görg (2009)	Sweden [1993-2002]	Complementary log-logistic model	-
Kronborg & Thomsen (2009)	Denmark [1895-2005]	Cox Proportional Hazard Model	+
Holmes, Hunt & Stone (2010)	UK [1973-1994]	Log-Logistic Hazard Model	+/n.s.

(+) means that foreign firms survive longer than domestic firms; (-) means that domestic firms survive longer than foreign firms; (n.s. = not significant) means that no differences exist between foreign and domestic firms in terms of survival.

**Source:** Own elaboration. \* Studies are presented in a chronological order;



### 2.3.3. FOREIGN OWNERSHIP AS A NEUTRAL FACTOR FOR FIRM SURVIVAL

A third branch of the literature on the relationship between foreign ownership and firm survival found that no significant difference exists between foreign-owned and domestic-owned companies in what concerns their survival trends and/or exit risks. By that, foreign ownership neither acts as a life-enhancing factor, nor as a catalyst to a premature death, but rather works as a neutral factor upon firms' dynamics.

For Portugal, the most important contributors to the understanding of foreign and domestic firms' dynamics have been provided by Mata and Portugal (1999, 2002, 2004) for the period 1983-1989. However, while Mata and Portugal's (2004) study has suggested that a "survival bonus" might exist in favour to foreign affiliates, more robust econometric techniques, in particular the duration models and time-to-event econometric procedures used by Mata and Portugal (1999, 2002), have show that foreign and domestic firms do not exhibit different chances of survival, that they respond similarly to the determinants of survival and display identical time patterns of exit. In summary, their general conclusions attest that being foreign-owned does not matter for survival, despite the differences found in size, human capital, legal structures and industries entered. As a result, they underline that managers should not assume that their firms will stay longer in the market just because it happens to be foreign.

For Japan and Turkey, analogous results were already identified. Kimura and Fujii (2003) studied the evolution patterns of Japanese firms during the late 1990s and found no evidence of a footloose behaviour among foreign firms. More recently, Kimura and Kiyota (2007) proved that, notwithstanding the superior performance exhibited by foreign firms in Japan, foreign ownership is not related to the likelihood of firm exit after controlling for the various characteristics of firms. In fact, their results state that firms with good performance are more likely to survive than firms with bad performance, but foreign ownership *per se* does not matter at all in the decision to exit. For Turkey, Özler and Taymaz (2004) corroborate this outcome as foreign-owned firms are found to be best performers than domestic ones (cf. Table 1), though foreign ownership in itself does not matter for survival. Later, Taymaz and Özler (2007) have deepened this analysis and asserted that, actually, foreign firms are less likely to exit but neither foreign ownership alone, nor foreign presence in the market matter for survival. On the other hand, what

matters is other industry and other firm characteristics, such as firm size or the quality of the labour force. Accordingly, this branch of the literature supports that the country's industrial policy should be ownership-neutral rather than discriminatory in favour to foreign affiliates' entry.

#### **2.4. FOREIGN AND DOMESTIC FIRMS UNDER CRISES: ARE FOREIGN MNEs (UN)STABILIZERS?**

From the previous literature, we realize that there is no consensus on the effect of foreign ownership in itself either on firm performance or on firm survival. Moreover, what still remains somewhat neglected, claiming for further research, is whether under a crisis environment foreign firms are affected or react differently than domestic firms, and, if that is the case, if the ownership advantages of the former make them weather the crisis in a better way helping to stabilize the host economy.

In the literature we find arguments for a stabilizer or otherwise role of foreign MNEs during crisis (McAleese and Counahan, 1979; Álvarez and Görg, 2007, 2009). On the one hand, foreign MNEs may introduce instability into host economies during economic crises because, compared to domestic firms, it is easier for them to transfer production facilities internationally (Flamm, 1984<sup>6</sup>; Lee and Makhija, 2009), to switch their sales from host countries to export markets (Lipsey, 2001), to cut operational costs (Gao and Eshaghoff, 2004) and, in the limit, to exit the local economy. These reactions may contribute to accelerate job losses and the decline in business activities, making more difficult the subsequent recovery process.

Conversely, rather than contributing to increase instability, foreign MNEs may impact positively in the host economy during crises. Foreign firms have the ability to use internal capital markets when faced with financial constraints, being able to access overseas credit through their parents, which allows them to expand their economic activity even in turbulent periods (Desai et al., 2004; Blalock et al., 2005). Moreover, being less reliant on domestic markets, foreign MNEs may be better able to lessen the adverse impact of a negative shock. In addition, foreign MNEs are unlikely to react aggressively to short

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<sup>6</sup> Flamm's argument is based on optimal portfolio theory, saying that when there are negative changes in the economy, foreign investors react and readjust their optimal portfolio and may thus leave the economy.

term changes in host country conditions since investing abroad involves substantial sunk costs and such an adverse reaction would impact negatively on MNEs' image (McAleese and Counahan, 1979).

The empirical literature on this question is not unanimous and can be divided into three broad categories: a first branch that shows that foreign ownership is a positive factor for firm behaviour under crisis, which means that foreign MNEs can be a stabilizer agent, by attenuating the negative effects of crises; a second one that supports the opposite, i.e. that foreign ownership is a negative factor and thus foreign MNEs react to crises periods more abruptly than domestic firms, worsening the crisis' impact on host economies; and a third set of studies showing that foreign MNEs and domestic firms do not behave differently during economic crises and thus there is no clear impact of MNEs' presence on the host country development and subsequent recovery. In this last case, foreign ownership is said to be a neutral factor for firm behaviour under crises. Table 3 summarizes the main empirical studies on these matters.

Available firm-level studies have typically been based on Asian financial crisis of 1997-1998 and have dealt with firms' responses either during crisis or after crisis. However, it is important to distinguish foreign firms' behavior during and after a crisis, since very different results may be obtained conditional on a short-term or medium/longer-term analysis. As a result, the time horizon of the empirical studies will be taken into account throughout the following literature review.

#### *2.4.1. FOREIGN OWNERSHIP AS A POSITIVE FACTOR FOR FIRM BEHAVIOUR*

##### *a) During crisis periods*

Drawing on Asian financial crisis started in the second half of 1997, Fukao (2001) studied how over 1100 Japanese subsidiaries operating in the ASEAN-4 countries and Korea immediately responded to the crisis. Despite the perseverance and embeddedness that seems to characterize Japanese MNEs, the author found some differences according to the subsidiaries' market-orientation. More precisely, the results revealed that local-market oriented subsidiaries were seriously hit by the reduction in local demand and price increases of imported inputs, while export-oriented subsidiaries (those with exports/sales ratios greater than 50 percent) benefited with the reduction of production costs, increasing

their sales by 17 percent and almost doubling their profits. At employment level, export-oriented subsidiaries presented an average growth lower than 1 percent and market-oriented ones barely reduced their employment levels, mainly due to parent firms' support. Moreover, the author also shows that Japanese subsidiaries were reluctant to cut their workforces even when their sales were declining, which supports the foreign MNEs' stabilizer role hypothesis. One possible explanation advanced by Fukao (2001) is that foreign subsidiaries remained patient due to the high sunk costs involved in Japanese FDI, often characterized by long-term relationships and the accumulation of firm-specific skills.

Following a similar research question, Wang et al. (2005), based on a sample of 1128 Japanese subsidiaries, studied the change in foreign subsidiaries' performance resulting from the onset of Asian crisis for the countries belonging to ASEAN-4. By looking for the factors determining the success and failure during such a turbulent period, the results disclosed that Japanese MNEs' affiliates are likely to be winners during a crisis, raising their performance levels, especially those with higher experiential knowledge in the country. Consequently, since the great part of foreign firms seem to have reacted positively to the crisis' beginning, the maintenance of that position in the subsequent periods may have helped to stabilize the turbulence in Asian economies.

Chung and Beamish (2005a) and Chung et al. (2008) have focused on ASEAN-5 countries under the same crisis environment and have also found evidence of a potential stabilizer function among foreign MNEs' affiliates. Chung and Beamish's (2005a) study highlights the importance of dynamic capabilities of foreign affiliates during a crisis, which make them able to integrate, build and reconfigure internal and external competencies to address the requirements of the environment and become increasingly flexible, which impacts positively upon their survival rates, even under a turmoil. Chung et al. (2008), by focusing on the relevance of multinational networks during times of crisis, showed that foreign subsidiaries in MNE networks survive longer in a crisis owing to their better access to resources and the advantages arising from such linkages, which provide them greater agility to adapt themselves to the new context. However, the value of MNE networks is not so evident during stable periods. Very recently, Lee and Makhija (2009) revisited the Asian crisis context and their main impacts in Korea. Their findings suggest that foreign firms' flexibility helped them to adapt to the crisis, to retain their success and

good performance and even to increase their value added and firm value. All these outcomes made them powerful elements for the recovery of Korean economy.

Evidence on other crisis' contexts also support the potential benefit arising from MNEs' presence during a crisis. Gao and Eshaghoff (2004) gave the example of the Argentine financial crisis in early 2000s, based on a sample of 82 MNEs respondents to a survey. By proposing a classification of foreign MNEs' responses to crises, the authors state that foreign firms were generally found to be patient and cautiously optimistic in their reactions, preferring to adapt themselves to the new environment by restructuring current operations, relieving excess capacity and reducing the operational costs, being interested in increasing investments even during the crisis, maintaining as well their resources within the country. Given the potential benefits arising from such an attitude by foreign multinational companies, the authors highlight the need to, and the crucial role of host governments in, restore foreign investors' confidence as a basis of the subsequent economic recovery of the country, in order to make them view that the crisis may also be an opportunity to reorganize themselves and become more efficient, rather than just a threat.

Finally, Görg and Strobl (2003a) use a different context to assess the footloose behaviour of foreign firms in Ireland and, instead, control for sector-specific cyclical effects which may impact on firm survival. By studying the dynamics of a sample with over 15.000 establishments during a large time span, the authors test the significance of foreign ownership for firm survival and job persistence during adverse conditions at sectoral level. Although they conclude that foreign-owned firms are, in fact, more footloose than domestic-owned ones, they show also that jobs generated in surviving MNEs are more persistent than jobs created in indigenous firms (cf. section 2.2.1). Actually, foreign MNEs in Ireland seem to be more likely to create new jobs only if they expect those jobs to last in the long run while domestic firms base job creation decisions more on a short term basis. As a result, if host governments apply the right measures to retain foreign investments and encourage foreign MNEs to face a decrease in the industry where they operate, clear benefits regarding the persistence of positive employment changes may result and thus stabilize the economic disorder.

*b) After crisis periods*

The responses of foreign firms immediately after the onset of the crisis – in the short-run – may differ from their behavior in *post-crisis* periods – in the medium/long-term. So, we must accurately review the empirical findings on the stabilizer role of foreign firms *after* the crisis, i.e., during the period of economic recovery.

Drawing from a survey of Japanese, European and North American transnational corporations (TNCs), Poon and Thompson (2001) showed that foreign-owned firms were responding positively to the expected changes, suggesting that the Asian crisis could lead them to raise their embeddedness in the region in the long-run. Motivated by market opportunities, low cost production and proximity to competitors' activities, foreign firms in Hong-Kong and Singapore demonstrated optimistic reactions in the onset of the Asian crisis and intended to be resilient in the subsequent periods, since they expected that the financial crisis would speed up reforms, leading to a better business environment. Thompson and Poon (2000) had already obtained similar conclusions only for TNCs operating in Singapore, while Thompson (2001) replicated the study for the sample of European TNCs operating in both countries. All the three studies, based on a deep descriptive analysis of foreign TNCs' responses to the survey, underlined that Asian countries should safeguard FDI and TNCs' presence to ensure the sustainability of a longer term economic recovery and to assist valuable technological transfers.

Athukorala (2003) exploits the same empirical setting to test the role of foreign MNEs' investments in the economic recovery of five ASEAN countries. After analyzing the evolutionary trends of FDI in the region and the comparative performance of foreign affiliates in economic adjustment, the findings suggest that foreign firms were instrumental to lessen the severity of economic collapse and to facilitate the recovery process. More precisely, the study confirms that FDI has weathered the Asian crisis far better than domestic private investment. Moreover, by analyzing the Malaysian case in detail, the statistics show that industries with higher MNEs' presence were at the lower end of the ranking of industries in terms of the degree of employment and output contractions and real wage compression. In summary, MNEs acted as cushion during the post-crisis period, playing a useful stabilizing role by limiting the fall in aggregate flows and facilitating the adjustment route.

Later in time, Blalock et al. (2005) compared the Asian post-crisis outcomes of Indonesian-owned exporters with those of foreign-owned exporters. The results established that both foreign and domestic exporters' value added and employment raised after the crisis, suggesting that they profited from the devaluation and had sufficient cash-flow to finance more workers. However, only foreign-owned exporters increased investment levels significantly, which means that foreign affiliates take advantage from their greater access to overseas financing, in opposition to domestic exporters who had to face the credit crunch. As a result, foreign affiliates adopted expansive behaviours that could be crucial for the quick recovery of Indonesian economy, helping to mitigate the financial handicap of local firms.

Similarly to Blalock et al. (2005), Narjoko and Hill (2007) examined in what extent foreign ownership and prior export orientation could be significant determinants for survival and recovery in Indonesia after the Asian crisis. Drawing on a sample of over 11.000 firms, the authors examined the determinants of performance adjustments between 1998 and 2000 and concluded that being an exporter foreign-owned firm was crucial to succeed in the post-crisis. However, it seems that only those firms with a high foreign ownership share (about 40 percent) exhibited superior performance, which confirms that the greater the parent share, the deeper the foreign firms' pockets, the lower their financial constraints and the higher the potential benefits arising from their presence in the recovery period.

Chung and Beamish (2005b) verified the above outcomes, based on a sample of Japanese subsidiaries operating in five emerging economies in Asia. Concerned with which type of subsidiary survive longer in the post-crisis, the authors show that foreign subsidiaries tend to take the form of wholly-owned subsidiaries and majority joint-ventures in the post-crisis environment and, consistently, subsidiaries with those characteristics are more likely to endure the periods subsequent to a crisis and thus stabilize the host economy and contribute to the adjustment trajectory. Finally, the experience lived in several Asian countries invested by Thai multinationals was expressed by Pananond (2007), who used case-study methods to prove that MNEs have adopted some post-crisis adjustments that would probably help to stabilize (or, at least, to decrease the instability in) the host economies. In detail, Thai MNEs have placed more emphasis and commitment on strengthening their industry-specific technological capabilities, becoming more and more

embedded in the host economy and thus denying the so-called “footloose behaviour” of foreign MNEs under a crisis.

*c) During and after crisis periods*

Within this first branch of the literature supporting the foreign MNEs’ stabilizer role hypothesis, some studies analyze both the periods during and after the crisis context. Edgington and Hayter (2001), as the majority of empirical evidence, used the empirical setting of Asian crisis to analyze the initial reactions of two Japanese MNEs (Toyota and Matsushita) and their subsequent behaviour as well. Their analysis advocates that existing firms had a remarkable resilience to the crisis, maintaining their operations and also expanding their exports so as to earn income from their Asian production in overseas currencies. Moreover, Japanese MNEs in general expected the long-term benefits of expanding in the region to outweigh the short-term risks, so they chose to become embedded in the region and not be so “footloose” as did portfolio investments. Consequently, potential gains with foreign presence were available for host economies both during and after crisis.

Desai et al. (2004) studied foreign firms’ responses in a different crisis environment, paying attention to currency depreciation events in a sample of 25 emerging economies. By analyzing foreign MNEs’ sales, assets and investment responses both during and after depreciation events, they conclude that foreign affiliates were able to expand their activity and performance indicators over such periods, while local firms showed little change. The enhanced relative performance of foreign MNEs is explained by their ability to use internal capital markets, which make them overcome the financial constraints suffered by local firms. In summary, as foreign firms are able to expand their activity precisely when host economies are fragile and prone to severe economic contractions, foreign affiliates can mitigate some of the aggregate effects of currency crises. Consequently, the results suggest that the increased economic activity due to foreign MNEs could support local firms through spillover effects such as increased demand for local inputs and higher levels of employment.

Finally, Takii and Ramstetter (2005) complement the studies on the Asian crisis by demonstrating that foreign firms’ performance in Indonesia increased steadily through



the early 1990s and that such expansion continued through and after the crisis, playing an important role in the recovery process of many Indonesian manufacturing industries.

#### 2.4.2. FOREIGN OWNERSHIP AS A NEGATIVE FACTOR FOR FIRM BEHAVIOUR

##### a) *During crisis periods*

Chen and So (2002), based on a sample of US MNEs with sales in the Asia-Pacific region, showed that the exchange rate fluctuations around the Asian financial crisis have negatively affected the sensitivity of those firms to stock market risk, leading them to adopt a more volatile behaviour than domestic firms. After seeing their market risk increase and their stock returns decrease, the main reaction of foreign MNEs was to reduce their exposure to the crisis and adopt a ‘stop-and-go’ attitude to protect themselves, which may have impacted negatively on subsequent adjustments of invested countries.

For Ireland, Görg and Strobl’s (2003a) study, despite having found that employment may be more stable in foreign MNEs during periods of sectoral turbulence, showed opposite outcomes regarding firm survival. In fact, foreign firms seem to be more footloose than their domestic counterparts, being more likely to leave if sectoral conditions change adversely. The explanation advanced by authors related to the fact that it is easier for foreign firms to move their production facilities abroad, which may produce strongly negative effects mainly on host economies with significant foreign shares at employment and output.

Very recently, Álvarez and Görg (2009) used the Chilean recession as empirical setting and presented robust evidence that foreign MNEs’ affiliates are more likely to exit when the economy is hit by a negative shock. However, this is only true for the case of domestic market-oriented MNEs, since exported-oriented MNEs were found to have replaced domestic sales by exports, which made them able to fend off the crisis’ negative effects and thus sustain their operations in the host economy.

Ihrig and Prior (2005) used a sample of 548 MNEs and 353 US domestic firms to study the effects of exchange rate fluctuations on foreign firms’ returns. The results were somewhat mixed, since only 15% of foreign MNEs were found to be highly exposed to the volatility and market risk, which have led them to contract their investments and become more risk-averse. However, only one in five US manufacturing firms suffered such an

exchange rate exposure, hence no clear conclusions about the potential (un)stabilizer role of foreign firms during crisis were achieved.

At last, Belderbos and Zou (2007) analyzed a sample of 940 surviving Japanese affiliates operating in nine Asian countries during the years leading up and into the Asian financial crisis and obtained conflicting results. Their study allowed observing different dynamic responses to changes in economic environment according to the affiliates' position in the MNEs' network. The negative impacts of crisis seem to have been more strongly felt by wholly-owned subsidiaries than by joint-ventures, with the former reacting more flexibly and thus searching for better opportunities outside the host country. Consequently, these divergent responses may either lead to lower or higher gains for host economies, conditional on the relative importance that each type of foreign subsidiaries reports in the host economy.

*b) After crisis periods*

Min et al. (2007) was the only study identified as supporter of the hypothesis that foreign MNEs destabilize the host economy after a crisis event. Based on a sample of MNEs from USA, Japan, UK and France, the authors examine whether and how the Asian crisis affected the distribution of FDI decisions in Korea during the 5-year period after the onset of the crisis. The results prove that foreign firms' decisions differed substantially according to their origin. More precisely, US and European MNEs had a "stop and go" reaction, particularly in terms of the real value of FDI projects, whereas Japanese MNEs' decisions were more conservative. A possible explanation for these results is associated to MNEs' motivations to invest in a country like Korea, as we will discuss in the next section. While Japanese MNEs' investments are largely motivated by labour strike and import considerations, which make domestic and foreign production to be complementary, Western MNEs were guided primarily by exchange rate and institutional factors, recognizing foreign and domestic production as substitutes. As a result, beside the country's culture, history, stage of economic development and crisis' experience already discussed, MNEs' motivations may also lead to very different conclusions when we try to assess their potential stabilizer role in a crisis environment.

**Table 3.** Empirical evidence on the potential MNEs' stabilizer role under crisis environments

Main Focus	Reference*	Country / Period of Data	Crisis' Context	Methodology	Firm Performance Measure	Potential impact of MNEs
<i>How do firms behave during crisis periods?</i>	McAleese & Counahan (1979)	Ireland / 1952-1977	Irish recession 1973-1977	Chi-square tests; Pearson correlations; Contingency tables	Employment growth	n.s.
	Fukao (2001)	5 Asian countries / 1996/1997	1997 East Asian financial crisis	OLS and Tobit	Growth of employment, sales and profits	+
	Chen & So (2002)	Asia-Pacific region / 1996-1998	1997 East Asian financial crisis	Single-factor market model (CAPM)	MNEs' stock return and market risk	-
	Görg & Strobl (2003a)	Ireland / 1973-1996	Sector-specific cycle	Cox Proportional Hazard Model	Firm survival Employment persistence	- +
	Gao & Eshaghoff (2004)	Argentina / 2002	Financial Crisis (2001/2002)	Exploratory factor analysis	Business strategies	+
	Chung & Beamish (2005a)	5 ASEAN Countries / 1993-1999	1997 East Asian financial crisis	Cox Proportional Hazard Model	Firm Survival	+
	Ihrig & Prior (2005)	Not Specified / 1995-1999	Exchange rate fluctuations	Exposure estimates using Jorion (1990) model	MNEs' returns	?
	Wang, Huang & Bansal (2005)	4 ASEAN countries / 1996/1998	1997 East Asian financial crisis	Logit and descriptive statistics	1996-1998 performance change	+
	Álvarez & Görg (2007)	Chile / 1990-2000	Chilean Economic Crisis 1995-2000	Difference-in-differences; Heckman 2-step estimation	Employment growth	n.s.
	Belderbos & Zou (2007)	9 Asian Countries / 1995-1999	1997 East Asian financial crisis	Probit; Heckman 2-step estimation	Employment growth	?
	Chung, Lu & Beamish (2008)	5 ASEAN countries / 1994-1999	1997 East Asian financial crisis	Cox Proportional Hazard Model; Random-effects estimations	Subsidiary exit and Subsidiary profitability	+
	Álvarez & Görg (2009)	Chile / 1990-2001	Economic Crisis 1995-2001	Probit	Firm survival	-
	Lee & Makhija (2009)	Korea / 1996 / 1998	1997 East Asian financial crisis	Cross-Section Linear Regression	Tobin's q	+
<i>How do firms behave after crisis periods?</i>	Poon & Thompson (2001)	Hong-Kong and Singapore / 1998	1997 East Asian financial crisis	Descriptive statistics; ANOVA	MNCs' embeddedness and expectations	+
	Athukorala (2003)	5 ASEAN countries / 1990-2001	1997 East Asian financial crisis	Descriptive Statistics	Employment and output	+
	Blalock, Gertler & Levine (2005)	Indonesia / 1990-2000	1997 East Asian financial crisis	Difference-in-differences; Probit	Value added, employment, investment and survival	+
	Chung & Beamish (2005b)	5 ASEAN countries / 1986-2001	1997 East Asian financial crisis	Logit; Multivariate analysis; Cox PHM	Firm strategy and firm survival	+
	Min, Rhim, Friesner & Cashel-Cordo (2007)	Korea / 1997-2001	1997 East Asian financial crisis	GLS and forecasting techniques	Number and value of FDI projects	?
	Narjoko & Hill (2007)	Indonesia / 1993-2000	1997 East Asian financial crisis	OLS; Probit; Heckman 2-step estimation	Real Value Added and firm survival	+
	Pananond (2007)	Several Asian countries / 1990s	1997 East Asian financial crisis	Case-Study	Networking Capabilities	+
<i>How do firms behave during and after crisis periods?</i>	Legewie (1999)	Southeast Asia countries / 1990s	1997 East Asian financial crisis	Descriptive statistics and case studies	Market orientation and internal structure	?
	Edgington & Hayter (2001)	5 ASEAN countries / 1990s	1997 East Asian financial crisis	Descriptive statistics and case studies	Investments and Exports	+
	Lipsey (2001)	LatinAmerica, Mexico and East Asia / 1980s and 1990s	Financial Crisis in Latin America (1982), Mexico (1994) and East Asia (1997)	Descriptive statistics	Employments, sales and exports	-
	Desai, Foley & Forbes (2004)	25 emerging economies / 1991-1999	Currency depreciations	Panel regression; IV; Bivariate analysis	Sales and assets (in level and growth rates)	+
	Takii & Ramstetter (2005)	Indonesia / 1975-2001	1997 East Asian financial crisis	Pooled regression; Descriptive statistics	Value added, employment and productivity	+

(+) - MNEs acted as a stabilizer element; (-) - MNEs acted as a unstabilizer element; (?) - Mixed results regarding MNEs' stabilizer role; (n.s. = not significant) - No evidence of a (un)stabilizer role for MNEs

Source: Own elaboration, \* Studies are presented in a chronological order

*c) During and after crisis periods*

Lipse (2001) studied the behaviour of US manufacturing affiliates under three crisis environments – Latin America, Mexico and East Asia – and concluded that foreign affiliates weathered the crises better than domestic firms. Foreign MNEs' main reaction during and after the crises was to switch their sales from host countries to export markets and to sharply curtail local sales, which severely affected the output contractions in host economies. At the employment levels, the decline by US affiliates was not so noticeable than it was for sales, recovering more quickly to the pre-crisis levels. In addition, R&D expenditures by US MNEs also fell sharply in every country. Facing a scenario like this, we could not expect at all that foreign firms can act as a stabilizer element in the recovery from a crisis.

Legewie (1999) obtained very similar conclusions to those of Min et al. (2007), with the exception that his study distinguished between short-term and long-term reactions of European, US and Japanese MNEs to the Asian crisis. Accordingly, in the short-run, all MNEs adopted a similar restrictive and defensive approach. In the long-run, Japanese affiliates were found to prefer to strengthen their existing affiliates, due to their strong domestic-market orientation, in opposition to Western MNEs which transferred their production activities faster. One more time, the FDI motivations of each group of MNEs can explain such approaches in face of a crisis – while Japanese FDI is based on a long-term commitment with host economies, the most Western MNEs look for a competitive market and a large production area when they invest abroad.

*2.4.3. FOREIGN OWNERSHIP AS A NEUTRAL FACTOR FOR FIRM BEHAVIOUR*

A small number of studies show that MNEs neither act as stabilizers nor disturbing agents during crises (e.g., McAleese and Counahan, 1979 for Ireland and Álvarez and Görg, 2007 for Chile). These authors found both groups of firms to display identical patterns of reaction when accounting for differences in the various firm-level and industry-level specificities, so thus they refute that MNEs may pull out more quickly than domestic firms when the economy is hit by a negative shock, leaving unclear the potential benefits or the eventual damages from foreign firms presence during crisis. However,

McAleese and Coughlan (1979) found large-sized foreign firms more stable than smaller ones in face of a recession. By contrast, Narjoko and Hill (2007) found an ambiguous effect of firm size, while Wang et al. (2005) argued that firm size is not an important determinant for firm success during a crisis.

To conclude, based on the great majority of the studies, we may expect foreign ownership to matter for firms' behaviour during a crisis period. However, there is no consensus regarding the direction of the effect. Nonetheless, those results may be conditional on a variety of factors, which we will refer as the potential moderating factors of foreign ownership effect under crises in the next section.

## **2.5. MODERATING FACTORS OF FOREIGN OWNERSHIP EFFECT UNDER CRISES**

### *2.5.1. CRISIS' SPECIFICITIES AND INVESTMENT MOTIVATIONS OF FOREIGN MNEs*

From the above, there seems to be no agreement on the foreign ownership effect under crises. The several empirical results must be carefully compared, as part of the differences may be related to the choice of the dependent variables (e.g., firm performance or growth measures and firm survival). The previous studies were also conducted under different crisis' contexts. For example, for the Asian crisis, foreign firms seem to have outperformed domestic ones, thus helping to soften the economic contraction and hasten the economic recovery. However, this result must be not generalized to other different crisis' environments, as the conclusions may vary according to the crisis' specificities. Nevertheless, the literature does not discuss in what extent the type of crisis matter for foreign firms' behaviour, though we expect that the crisis' nature may interfere with the foreign ownership effect. For instance, a domestic crisis (that is, a crisis specific to the local economy) may be more likely to induce an adverse reaction among foreign firms, which may easily re-allocate their resources and search for a better environment anywhere outside the host country. Conversely, an international crisis limits the choices of re-allocation of foreign MNEs, so that they may be more resilient and patient in face of a

global turmoil. Despite that, foreign MNEs' motivations<sup>7</sup> may play an even greater role in their reactions to a domestic or global adverse shock.

In what regards market-seeking MNEs, their sales and employment will be severely hit from a domestic shock (mainly from an adverse shock in demand), but not in a particularly different way from domestic firms. They may however resist better, due to their superior financial conditions and to better expectations about the future. Nonetheless, if their long-term expectations in that market are not better than those of local firms, they may strongly cut the operations in the local economy.

Foreign MNEs established in a country mainly to have better access to resources or efficiency (resource-seeking or efficiency-seeking MNEs, respectively), are probably more export-oriented than purely domestic firms. Hence, their sales and employment levels may be less affected than indigenous firms' levels in a crisis' setting. Foreign MNEs may even benefit from a domestic decline in the prices of inputs to expand sales abroad. If the crisis is associated to a (domestic or global) rise in input prices, MNEs may react better than domestic firms if they are able to access to inputs in better conditions than their indigenous counterparts. Otherwise, they may react more adversely than local firms by reconfiguring their local and/or global competitive strategies and hence redeploy their activities, motivated by better conditions elsewhere (Gao and Eshaghoff, 2004; Álvarez and Görg, 2007, 2009).

Finally, strategic asset-seeking MNEs are expected to be more resilient during crises, due to potential sunk costs of their specific investments. Moreover, their expectations of long-term benefits may lead them to expand in the region to outweigh the short-term risks. So, they may choose to become embedded in the region and not be so "footloose" as commonly portfolio investments are during a crisis (Edgington and Hayter, 2001).

All these theoretical expectations can be raised from the literature, but they should be empirically tested. Besides, there are firm's and industry's characteristics likely to affect firm performance and survival under a crisis' context and where foreign and domestic

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<sup>7</sup> Dunning (1988, 1993) and Dunning and Lundan (2008) classify the MNEs' motivations in four broad types: resource-seeking (leading MNEs to vertically integrate, motivated by the availability of resources and/or their lower costs), market-seeking (for cases when MNEs invest abroad to guarantee a larger market for their products and services), efficiency-seeking (when MNEs are motivated to invest in host countries to obtain economies of scale and scope and/or risk reduction through product diversification) and strategic-asset seeking (in order to gain new product lines and new markets, to obtain economies of synergy, economies of common governance and to improve their competitive and strategic advantages).

firms very often differ. Next, we review the main comparative studies on the differences between foreign-owned and domestic-owned firms, in order to identify other firm-level and industry-level variables that may moderate the foreign ownership effect under a crisis.

### *2.5.2. FOREIGN AND DOMESTIC FIRMS: WHERE DO THEY DIFFER?*

The IB literature has early established that a reason why a firm decides to invest abroad is the ownership of firm-specific advantages, not available to domestic firms in the host country (Hymer, 1957; Vernon, 1966; Caves, 1974; Dunning, 1981). Accordingly, we expect that these advantages assist foreign MNEs to achieve a differentiated behaviour and a favourable position compared to their domestic competitors. Moreover, as we previously stated, such different characteristics may also act as moderating factors of foreign MNEs' behaviour during a crisis event, so that a different reaction by foreign-owned firms may be the result of their superior characteristics, rather than a pure ownership effect.

The empirical literature concerned with the differences between foreign-owned firms and local firms highlights that the main areas where foreign firms widely differ from domestic ones are size and scale, wages, human capital, productivity, technology intensity, innovation activities, export orientation and entry patterns (Blomström and Kokko, 1998; Ramstetter, 1999; Hanson, 2001; Sleuwaegen and DeBacker, 2003a; Bellak, 2004b, among others). Table 4 presents a summary of the main comparative studies between foreign-owned firms and their local counterparts.

Size and scale are one of the firm-level differences where the comparative studies reviewed commonly agree in favour of foreign superiority. In fact, not only for Portugal (Farinha and Mata, 1996; Barbosa and Louri, 2005), but also for many countries around the world (e.g., Doms and Jensen (1998) for USA, Baldwin and Gu (2004) for Canada, Kimura and Kiyota (2007) for Japan), there is strong evidence that foreign-firms are larger than domestic ones. This may result from, on the one hand, a better access to financial support by foreign firms, either through their parent company or their worldwide networks (Bonn, 2000; Delios and Beamish, 2001; Ushijima, 2005; Xu and Lu, 2007), or alternatively, a way through which MNEs try to overcome the well known liability of foreignness (Li and Guisinger, 1991; Zaheer and Mosakowski, 1997; Fertala, 2008).

Notwithstanding, the differences at firm size may be related as well to the dimension of the market that firms have to serve. Thus, given the common foreign firms' export-orientation (e.g. Anastassopoulos, 2003; Baldwin and Gu, 2004; Magalhães and Africano, 2007), in contrast to the typical local market-orientation of domestic firms, the larger scale presented by MNEs' affiliates may be a natural outcome.

Firm-level differences related to human capital, workforce qualifications and wage gaps have also attracted the attention of researchers over the time, who mostly confirm the superiority of foreign firms. Human capital is increasingly understood as the most important competitive factor at firm-level, exerting significant impacts on firms' evolution and growth (Teixeira, 2002; Almeida, 2003; Bellak, 2004a, 2004b; Teixeira and Tavares-Lehmann, 2007), and the available empirical evidence suggests that foreign MNEs and their subsidiaries often present important pools of skilled labor, which tends to be highly relevant to increase their productivity levels, to "decode" new technical information and to incorporate it into the manufacturing process and thus create value (Teixeira, 2002). Moreover, the differences in the workforce qualifications may also justify the disparity found at wages level, since better qualified workers usually earn higher wages (e.g., Doms and Jensen, 1998; Ernst, 2005). However, the differences in wages are not absolutely explained by the literature. Beside the qualifications of workers, other factors may explain this wage gap, as firms' performance (better performed firms may pay higher wages), firms' management policies (higher wages may work as an incentive to raise the workers' effort and, hence, the productivity or even to attract the "best" workers in the market), firms' technology and capital intensity or even firms' size (Globerman, Ries and Vertinsky, 1994; Jimeno et al., 2000; Bellak, 2004a, 2004b; Martins, 2008). As a result, many firm-level characteristics, rather than foreign ownership *per se*, may be the source of such wage gap. Actually, Feliciano and Lipsey (1999) have shown that after controlling for firms' and industries' characteristics, the wage gap totally vanishes.

Technology intensity and innovation activities also seem to work as discriminating factors between foreign and domestic firms. According to Markusen (1995), foreign MNEs have assumed greater importance in industries with higher intensity on R&D activities, higher proportion of qualified professionals, in sectors where new and technologically advanced products are produced, as well as in industries with higher levels of advertisement (see also Kuemmerle, 1999; Andersson, Forsgren and Pederson, 2001).



This evidence also supports the different specialization patterns of foreign-owned firms, a situation frequently found for the Portuguese case (Cabral, 1996; Gonçalves and Guimarães, 1997; Freitas and Paes Mamede, 2008), where foreign enterprises tend to concentrate themselves in more technologically complex sectors. Accordingly, this magnitude of foreign firms in R&D intensive industries may lead to positive effects on industrial diversification, contributing as well to the regeneration of the productive structure of host economies.

All the above empirical findings tend to support an additional difference between foreign subsidiaries and local firms, now related to the patterns of entry. More precisely, foreign-owned firms tend to choose industries where the entry barriers are higher – namely, more dynamic, concentrated and technologically complex industries and where a greater minimum efficient scale is required to operate efficiently (Howenstine and Zeile, 1992; Bloömstrom and Kokko, 1998; Doms and Jensen, 1998; Görg and Strobl, 2000). For Portugal, this evidence was already been well documented by the studies of Mata and Portugal (1999, 2002, 2004), Barbosa et al. (2004) and Barbosa and Louri (2005), which have shown that foreign firms often enter the industries where growth rates, concentration, R&D intensity and foreign presence are higher, thus exhibiting greater ability to overcome entry barriers. On the other hand, industries where entry is more difficult also tend to be more profitable and attractive in terms of potential gains, which may explain the foreign superiority at profitability levels shown by studies as Kumar (1990) and Cardoso (2008), among others.

All these firms' and industries' characteristics where foreign and domestic firms are found to be different are likely to affect firm performance and dynamics under a crisis' context. Moreover, they may act as moderating factors of the effect arising from foreign ownership upon firm performance and/or survival. Consequently, we must properly account for them in order to investigate if there remain any significant differences on firm behaviour that can be attributed to foreignness *per se*. Next, we specially attend on firm size as a potential moderating factor of foreign ownership effect under a crisis event.

**Table 4.** Empirical evidence on the differences between foreign and domestic firms

<b>Where do DF and FF differ?</b>	<b>Empirical Evidence</b>
	Reference*, year [country]
<i>SIZE AND SCALE</i>	Howenstine & Zeile, 1992 [USA]; Willmore, 1992 [Brazil]; Farinha & Mata, 1996 [ <b>Portugal</b> ]; Bloömstrom & Kokko, 1998 [n.a.]; Doms & Jensen, 1998 [USA]; Görg & Strobl, 2000 [Ireland]; Mata & Portugal, 2001, 2002, 2004 [ <b>Portugal</b> ]; Anastassopoulos, 2003 [Greece]; Bernard & Sjöholm, 2003 [Indonesia]; Baldwin & Gu, 2004 [Canada]; Özler & Taymaz, 2004 [Turkey]; Barbosa & Louri, 2005 [ <b>Portugal</b> , Greece]; Kimura & Kiyota, 2007 [Japan]; Álvarez & Görg, 2009 [Chile]
<i>WORKFORCE QUALITY/HUMAN CAPITAL</i>	Doms & Jensen, 1998 [USA]; Oulton, 1998a, 1998b [UK]; Griffith & Simpson, 2001 [UK]; Almeida, 2003 [ <b>Portugal</b> ]; Bellak, 2004a, 2004b [n.a.]; Mata & Portugal, 2004 [ <b>Portugal</b> ]; Taymaz & Özler, 2007 [Turkey]; Teixeira & Tavares-Lehmann, 2007 [ <b>Portugal</b> ]
<i>EXPORTING BEHAVIOR</i>	Willmore, 1992 [Brazil]; Cabral, 1996 [ <b>Portugal</b> ]; Barbosa & Louri, 2002 [ <b>Portugal</b> , Greece]; Anastassopoulos, 2003 [Greece]; Baldwin & Gu, 2004 [Canada]; Barbosa, Guimarães & Woodward, 2004 [ <b>Portugal</b> ]; Tavares & Young, 2006 [ <b>Portugal</b> ]; Magalhães & Africano, 2007 [ <b>Portugal</b> ]
<i>TECHNOLOGY INTENSITY AND INNOVATION</i>	Howenstine & Zeile, 1992 [USA]; Doms & Jensen, 1998 [USA]; Gugler, 1998 [Austria]; Forsgren, Pedersen & Foss, 1999 [Denmark]; Anastassopoulos, 2003 [Greece]; Baldwin & Gu, 2004 [Canada]; Özler & Taymaz, 2004 [Turkey]; Barbosa & Louri, 2005 [ <b>Portugal</b> ]; Criscuolo, 2005 [OECD]; Benfratello & Sembenelli, 2006 [Italy]; Kimura & Kiyota, 2007 [Japan]; Taymaz & Özler, 2007 [Turkey]; Freitas & Paes Mamede [ <b>Portugal</b> ]
<i>AVERAGE WAGES</i>	Howenstine & Zeile, 1992 [USA]; Willmore, 1992 [Brazil]; Globerman, Ries & Vertinsky, 1994 [Canada]; Doms & Jensen, 1998 [USA]; Feliciano & Lipsey, 1999 [USA]; Griffith & Simpson, 2001 [UK]; Almeida, 2003 [ <b>Portugal</b> ]; Bellak, 2004a, 2004b [n.a.]; Mata & Portugal, 2004 [ <b>Portugal</b> ]; Özler & Taymaz, 2004 [Turkey]; Taylor & Driffield, 2004 [UK]; Kimura & Kiyota, 2007 [Japan]; Taymaz & Özler, 2007 [Turkey]; Martins, 2008 [ <b>Portugal</b> ]
<i>SPECIALIZATION PATTERNS</i>	Cabral, 1996 [ <b>Portugal</b> ]; Gonçalves & Guimarães, 1997 [ <b>Portugal</b> ]; Freitas & Paes Mamede, 2008 [ <b>Portugal</b> ]
<i>CAPITAL INTENSITY</i>	Howenstine & Zeile, 1992 [USA]; Doms & Jensen, 1998 [USA]; Oulton, 1998a, 1998b [UK]; Bellak, 2004a, 2004b [n.a.]; Barbosa & Louri, 2005 [ <b>Portugal</b> , Greece]; Kimura & Kiyota, 2007 [Japan]
<i>ADVERTISEMENT INTENSITY</i>	Bloömstrom & Kokko, 1998 [n.a.]; Özler & Taymaz, 2004 [Turkey]
<i>ABILITY TO OVERCOME ENTRY BARRIERS</i>	Howenstine & Zeile, 1992 [USA]; Bloömstrom & Kokko, 1998 [n.a.]; Doms & Jensen, 1998 [USA]; Görg & Strobl, 2000 [Ireland]; Mata & Portugal, 2001, 2002, 2004 [ <b>Portugal</b> ]; Barbosa, Guimarães & Woodward, 2004 [ <b>Portugal</b> ]; Barbosa & Louri, 2005 [ <b>Portugal</b> ]; Taymaz & Özler, 2007 [Turkey]

n.a. = not applicable, which means that the study is a survey of empirical literature. \*Studies are presented in a chronological order.

Source: Own elaboration

### *2.5.3. FIRM SIZE AS A MODERATING FACTOR OF FOREIGN OWNERSHIP EFFECT*

The link between firm size and firm evolution during and after crises was a neglected question, at least before Asian financial crisis. Moreover, the literature has paid little attention to the relationship between crisis' environments and smaller firms' performance, focusing the interest on banks and large corporations (Régner, 2005; Özar et al., 2008). Besides, studies recognizing firm size as a potential moderating factor of foreign MNEs' responses to crisis episodes are even scarcer. The limited empirical evidence about SMEs' (Small and Medium-Firms) and LEs' (Large Enterprises) responses to crisis periods has provided mixed outcomes, leaving unidentified which of those two groups are the common winners and losers during a crisis. As a result, we still doubt on the effect on firm size on firms' behaviour under crises.

It is often argued that smaller enterprises are more flexible in adjusting to a downturn of the economy (Özar et al., 2008) and today, it is increasingly accepted that small businesses are not just "little big businesses", but rather that SMEs have their own particular characteristics that affect the way they operate and react to the adversities (Hill et al., 2002). In addition, the increasing role of small firms in economic growth and development, acting as a key source of jobs, business dynamism and innovation (e.g. Gregory et al., 2002; Harvie, 2003; OECD, 2009) raises the concern about their potential role in the post-crisis recovery process as business cycle shock absorbers and potential stabilizer agents. However, a plethora of arguments make us expect that, facing a crisis environment, LEs can do better than SMEs. Table 5 presents a synopsis of the main conflicting arguments found in the literature about the relationship between firm size and firms' behaviour under crises, by distinguishing the reasons for a potential (un)stabilizer role of SMEs, compared to LEs, regardless their ownership. A summary of the main comparative studies between SMEs' and LEs' performance and the role of firm size under crises' contexts can be found in Table 6.

**Table 5.** Arguments for a different behavior between SMEs and LEs during crisis

<b>Arguments for SMEs being potential unstabilizer agents ⇔ Firm size as a positive factor under crises</b>	<b>Argued by*...</b>
<ul style="list-style-type: none"> <li>• <i>SMEs' resources</i></li> </ul>	
SMEs often lack technology, know-how, management skills and innovative capacity.	Nugent & Yhee (2002); Régnier (2005)
SMEs are unlikely to have contingency plans to help to smooth potential shocks.	Butler & Sullivan (2005); Marino et al. (2008)
SMEs are more financially constrained due to inadequate access to finance.	Gertler & Gilchrist (1994); Mulhern (1996); Forbes (2002); Nugent & Yhee (2002); Liu (2004); Beck, Demirgüç-Kunt & Maksimovic (2005); Narjoko & Hill (2007); Das & Pradhan (2009); Hodorogel (2009); OECD (2009)
<ul style="list-style-type: none"> <li>• <i>SMEs' market orientation</i></li> </ul>	
SMEs are less geographically diversified, being embedded in few regions and thus rarely export-oriented.	Butler & Sullivan (2005); Narjoko & Hill (2007); OECD (2009)
<ul style="list-style-type: none"> <li>• <i>SMEs' linkages</i></li> </ul>	
SMEs are often strongly dependent on few customers and suppliers.	Nugent & Yhee (2002)
<b>Arguments for SMEs being potential stabilizer agents ⇔ Firm size as a negative factor under crises</b>	<b>Argued by*...</b>
<ul style="list-style-type: none"> <li>• SMEs are more flexible and resilient, being more able to exploit market niches.</li> </ul>	Berry, Rodriguez & Sandee (2001); Gregory, Harvie & Lee (2002); Hall & Harvie (2003); Narjoko & Hill (2007); Hodorogel (2009)
<ul style="list-style-type: none"> <li>• SMEs concentrate on activities characterized by economies of agglomeration, rather than economies of scale.</li> </ul>	Berry, Rodriguez & Sandee (2001); Hall & Harvie (2003)
<ul style="list-style-type: none"> <li>• SMEs are less reliant on formal credits, thus less burdened by debts.</li> </ul>	Sato (2000); Berry, Rodriguez & Sandee (2001); ter Wengel & Rodriguez (2006)
<ul style="list-style-type: none"> <li>• SMEs' smaller size may be an advantage, since SMEs are less submitted to inertia, rigidity and sunk costs, in opposition to LEs.</li> </ul>	Tan & See (2004)
<ul style="list-style-type: none"> <li>• SMEs can overcome their technological disadvantages through imitation, being a follower and acquiring second-hand equipment from LEs.</li> </ul>	Nugent & Yhee (2002); Gregory, Harvie & Lee (2002)

**Source:** Own elaboration. \*Studies are presented in a chronological order.

*a) Firm size as a positive factor for firm behaviour under crises*

The seminal article of McAleese and Counahan (1979) was one of the first studies looking for a potential stabilizer role played by a specific group of firms during recessions. By comparing the employment growth/decline in foreign MNEs and domestic firms in Ireland, their analysis also paid attention to the moderating effects of firm size. Accordingly, despite no evidence was found on the effect of foreign ownership upon firms' evolution during the recessive periods analyzed (remember the section 2.4.3), different conclusions were obtained regarding the effect of firm size. In fact, some foreign MNEs – those characterized by a larger scale and thus higher market autonomy – were found to be more stable during economic shakeouts. In opposition, smaller firms (both foreign and domestic) suffered greater instability and larger employment declines, which made them a potential disturbing element for the subsequent economic recuperation.

Mulhern (1996) focused on the Venezuelan small firms during the crisis of 1989-1994. Based on simple statistics, the author observes several performance indicators, as output contraction, employment evolution and failure rates. The overall picture points that smaller firms were severely affected by that economic contraction, as within a one-year period after the crisis, it was estimated that 50% of SMEs were either closed or became inactive. This outcome was in part explained by SMEs' difficulty in obtaining finance and information, by their lack of skilled managers and an unsympathetic treatment by banks.

Using a broader perspective, Higson et al. (2002) studied the impact of the business cycle in the growth rate of US quoted companies' sales and concluded that, in the expansion phases, smaller firms on average grow faster than larger ones, while during contractions, this tendency is tempered in favour of large firms. Then, despite in normal conditions smaller and medium firms perform an important function for the economy, this is not always true during turbulent periods. Beck et al.'s (2005) study also rejected the hypothesis that SMEs can do better than LEs during adversities, since smaller firms tend to be the most adversely affected by financial, legal and/or corruption obstacles, mainly due to their higher financial constraints, which is more evident in less developed countries.

For Turkey, Özar et al. (2008) concluded that, despite the important role of smaller firms in alleviating poverty, generating new jobs, being also a key source of firm dynamism and innovation, the 2001 financial crisis caused a dramatic disruption on SMEs' growth. Possible explanations are associated to the encouragement given to small firms to

use external credit to facilitate their growth, which becomes a harmful strategy in times of crisis due to the skyrocketing interest rates that smaller firms have to bear.

For the *after crisis* time horizon, Gertler and Gilchrist (1994) stated that the adverse periods had a substantially larger negative effect on SMEs, as small firms' sales tended to drop more than 4% per year faster than larger firms, thus accounting for a significant disproportionate amount of the ensuing decline in the manufacturing industry. Finally, Domaç and Ferri (1999) evaluated both the *during* and the *after crisis* periods for Korea and provided evidence on SMEs' weakness, compared to LEs. They demonstrate that Korean SMEs suffered disproportionately from the Asian financial crisis and from severe monetary restrictions, mainly due to their strong dependence on small banks' lending. Consequently, firm size was revealed to be an important positive factor for firms' ability to survive the crisis.

*b) Firm size as a negative factor for firm behaviour under crises*

Sato (2000) used the Indonesian metal-working and machinery component industry to examine how the Asian financial crisis has affected SMEs. The results demonstrated that, despite wide fluctuations in SMEs' performance, export-related small business remained profitable and assured their good markets even after the crisis' turmoil, which made them relatively better off than larger enterprises. Using the same empirical background, ter Wengel and Rodriguez (2006) analyzed the export performance of Indonesian SMEs after the Asian crisis. Their outcomes showed that while LEs contracted and reduced their exports, SMEs grew and expanded their sales overseas, maybe because they were not so reliant on formal credit like their larger counterparts, which had been largely exposed to an easy access to finance and imprudent banking practices, leaving them a large burden of loans and a consequent inert position in face of an external shock.

For Singapore, Tan and See (2004) found a negative correlation between firm performance and firm size, with LEs suffering the highest declines after the crisis, due to their inertia problems. Régnier's (2005) standpoint confirmed that SMEs tend to be more resilient than LEs. Moreover, local SMEs linked to transnational corporations or other type of foreign affiliates have proven to be even more resilient than purely domestic market-oriented SMEs, due to various forms of assistance from the foreign partner, which proves that the effects of firm size and foreign ownership may be related under a crisis.

**Table 6.** Empirical evidence on the firm size effect under crisis environments

Main Focus	Reference*	Country / Period of Data	Crisis' Context	Methodology	Firm Performance Measure	Firm size effect
<i>How do firms behave during crisis periods?</i>	McAleese & Counahan (1979)	Ireland / 1952-1977	Irish recession 1973-1977	Chi-square tests; Pearson correlations; Contingency tables	Employment growth	+
	Mulhern (1996)	Venezuela / 1989-1994	1994 Venezuelan economic crisis	Descriptive Statistics	General Performance	+
	Higson, Holly & Kattuman (2002)	USA / 1950-1999	US Business Cycle Fluctuations	Descriptive Statistics, Data Analysis, OLS and GMM	Growth rate of sales	+
	Beck, Demirgüç-Kunt & Maksimovic (2005)	54 Countries / 1995-1999	Financial, legal and corruption obstacles	Panel Data Models	Growth rate of sales	+
	Larsen & Bjerkeland (2005)	Norway / 1988-2004	Banking crisis in the early 1990s	Norges Bank's bankruptcy prediction model Sebra	Firms' loan losses	?
	Özar, Özertan & Irfanoglu (2008)	Turkey / 2001	2001 Turkish financial crisis	Cross-sectional regression	Employment growth	+
<i>How do firms behave after crisis periods?</i>	Gertler & Gilchrist (1994)	USA / 1960-1991	1981-82 US recession and "Romer dates"	Descriptive Statistics, bivariate VAR analysis and structural equations	Sales, inventories and short-term debt	+
	Sato (2000)	Indonesia / 1997-1999	1997 East Asian financial crisis	Descriptive Statistics and Data Analysis	Growth rate of assets and profits	-
	Tan & See (2004)	Singapore / 1995-1998	1997 East Asian financial crisis	Cross-sectional regression	Strategic reorientation	-
	Régnier (2005)	Thailand / 1998-2000	1997 East Asian financial crisis	Descriptive Statistics	General Resilience	-
	ter Wengel & Rodriguez (2006)	Indonesia / 1996-2000	1997 East Asian financial crisis	Fractional Logit and Double-bounded Tobit	Export Performance	-
<i>How do firms behave during and after crisis periods?</i>	Domaç & Ferri (1999)	Korea / 1992-1998	1997 East Asian financial crisis	Descriptive Statistics and VAR Analysis	Firms' industrial production	+
	Claessens, Djankov & Xu (2000)	6 Asian Countries / 1988-1998	1997 East Asian financial crisis	Cross-sectional pooled regression	ROA and debt burden	n.s.
	Berry, Rodriguez & Sandee (2001)	Indonesia / 1990s	1997 East Asian financial crisis	Descriptive Statistics	Productivity Growth	-
	Forbes (2002)	42 Countries / 1997-2000	Currency Depreciations Events	Panel Data Models	Sales, net income, asset value, market capitalization	?
	Gregory, Harvie & Lee (2002)	Korea / 1990s and early 2000s	1997 East Asian financial crisis	Descriptive Statistics	General Performance	-

(+) - Firm Size has a positive effect upon firm performance under crises, thus SMEs are unstabilizer elements; (-) - Firm Size has a negative effect upon firm performance under crises, thus SMEs are potential stabilizer elements; (?) - Mixed results regarding SMEs' stabilizer role; (n.s. = not significant) - No evidence of a (un)stabilizer role for SMEs or LEs

Source: Own elaboration, \* Studies are presented in a chronological order

Berry et al. (2001) and Gregory et al. (2002) studied the SMEs' dynamics both *during* and *after* the Asian financial crisis. The former discussed the firms' evolution in Indonesia and showed that smaller firms were found to have weathered the crisis better than larger companies, being able to respond more quickly and flexibly to the sudden shocks, mainly because they were less dependent on formal markets and formal credit. In addition, SMEs' resilience during and after the crisis was also explained by their ability to exploit market niches and take advantage of economies of agglomeration, in opposition to larger firms, which were more reliant on economies of scale and whose production structure took more time to be reorganized. Gregory et al. (2002) focused on Korean experience and concluded that, despite the negative effects of crisis on SMEs, smaller firms showed remarkable resilience during and after the Asian financial crisis. Accordingly, the negative relation found between firm size and firm behaviour imply that SMEs were potential shock absorbers and important stabilizer elements, playing an important role in the subsequent recovery process, by helping to create jobs or absorbing the employees dispensed by LEs, and thus improving their efficiency, growth and exports.

*c) Firm size as a neutral factor for firm behaviour under crises*

Only Claessens et al. (2000) has clearly found that firm size neither impacts positively nor negatively on firm behaviour during or after crisis events, but rather acts as a neutral factor. Their results show that LEs were not necessarily better able than SMEs to weather the Asian crisis. Actually, other factors were found to be more important than firm size to explain the way firm evolve during and after turbulent periods, like previous vulnerabilities in corporate financial structures.

Larsen and Bjerkeland (2005) and Forbes (2002) were the two inconclusive studies within the sample of studies reviewed, obtaining mixed results about the potential firm size effect upon firm performance measures under a crisis. Larsen and Bjerkeland (2005) used the early 90s banking crisis in Norway as empirical setting to test the differences between SMEs and LEs in what concerns their loan losses. According to their outcomes, unexpected loan losses have been lower for SMEs' loans than for those of larger enterprises in about 2/3 of the period reviewed (1988-2004), while in the remaining period the opposite scenario was found. As a result, they do not have a basis for concluding



whether SMEs or LEs have better supported such a crisis episode. Moreover, the results depend on the model used and the method for calculating unexpected losses.

Similar problems were faced by Forbes (2002), who studied the firms' evolution during and after currency crises in 42 different countries. Overall, the results suggested that larger firms tend to have worse performance than smaller firms. However, the significance of such upshot fluctuates across different performance measures and also according to the methodological procedure adopted, so that no definite conclusions were provided about the potential firm size effect upon firm performance measures during and after crises.

## **2.6. CONCLUDING REMARKS AND DEFINITION OF RESEARCH QUESTIONS**

After the analysis of the literature discussed in the previous sections and paying attention to the currently environment of global financial and economic crisis, we claim for the important and well-timed debate on the role of foreign MNEs in face of a crisis and the respective impact in host countries' economy. Foreign firms either can help to alleviate the crisis' effects owing to their ownership advantages and their consequent superior performance or survival perspectives, or can add to macroeconomic instability due to the ease with which they can transfer production facilities from one country to another.

From the literature review, there is no consensus about the effect of foreign ownership upon firm performance and firm survival, either during normal conditions or under a crisis event. Moreover, there are also several firm-level and industry-level characteristics where foreign and domestic firms very often differ and which are likely to affect the performance, growth and survival of firms, and hence moderate the effect arising from foreign ownership. Accordingly, in our analysis we must properly account for them, in order to investigate if there remain any significant differences in firm performance and firm survival/failure that can be attributed to foreignness *per se* during a crisis event.

Accordingly, this dissertation aims at filling the gap in the literature by addressing three main research questions:

*1) Does foreign ownership helps to differentiate the performance and survival of firms?*

*2) Does the foreignness effect changes during crises? i. e. Can foreign firms act, in some extent, as stabilizers during economic slowdowns?*

*3) How firm size interferes with the foreign ownership effect during economic slowdowns?*

In the next sections we provide a first look into the data and the empirical setting used to answer the above questions, followed by the presentation of our methodological procedures, and subsequently the discussion of our empirical results and their policy implications.

## CHAPTER 3

### FOREIGN AND DOMESTIC FIRMS IN PORTUGUESE MANUFACTURING INDUSTRY (PMI): A FIRST LOOK INTO THE DATA

#### 3.1. INITIAL CONSIDERATIONS

From the previous literature review, we conclude that foreign ownership can be an important source of firm heterogeneity, affecting the dynamics of performance and survival. However, the international literature also points that foreign and domestic firms often differ in several characteristics, as size, productivity, human capital or industries entered. Actually, these differences at firm- and industry-level may soften the effect of foreign ownership, so that we must properly account for them, in order to investigate if there remain any significant differences in firms' behaviour that can be attributed to foreignness *per se*.

In this chapter we provide a first look into the data, by conducting a dynamic and comparative analysis of evolutionary differences between foreign and domestic firms in general and also disaggregated into different size classes. Based on descriptive statistics and data analysis, we search for a differentiated behaviour between foreign and Portuguese firms over a 20-year period (1988-2007). In particular, we pay special attention to issues of scale, operational performance, human capital and geographical location, after assessing the relative importance of foreign firms in Portuguese manufacturing and also their entry patterns in the different industries.

#### 3.2. EMPIRICAL SETTING

Since the EEC accession in 1986, Portugal experienced an outstanding growth of FDI inflows, even compared with the FDI growth in neighbouring Spain or other small OECD countries (OECD, 1994). Over the period, foreign firms assumed a significant role

in the modernization and dynamics of the Portuguese economy. According to Tavares (2002) and Barbosa et al. (2004), the relatively lower input costs and the export opportunities due to the country's location in Western Europe were the main motivations for foreign entry and permanence, which shows the importance of both efficiency-seeking and, to a less scale, market-seeking motivations of foreign MNEs operating in Portugal. In manufacturing, a bulk of foreign subsidiaries have located in Portuguese industries with the aim of benefiting from factor price differences between this small open economy and other countries in Europe, and, to a less extent, from a small but growing market.

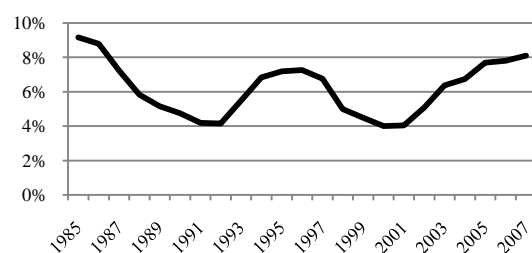
During the period under analysis (1988-2007), the Portuguese economy experienced periods of considerable growth but also years of recession: the early 1990s (1991-1993) and 2000s (2001-2003). These were characterized by declines in GDP, private consumption and investment and an increase in unemployment (Figures 2 and 3). These recessions were associated to a decline in economic activity which occurred mainly in developed countries, leading to considerable declines in Portuguese exports and in private consumption along with investment contraction. Nonetheless, internally, reductions in public investment and gross fixed capital formation, in addition to fragilities at total factor productivity also contributed to further declines in economic activity (Bank of Portugal, 2009a, 2009b). These recessions are likely to have affected firms' performance, but the effect may differ between firms and industries. From this section onwards, we investigate in specific how (and if) foreign ownership had affected firms' employment growth, sales turnover growth and survival, overall and during recessions in particular.

**Figure 2.** Annual growth rate of Portuguese real GDP



Source: OECD – Country Statistical Profiles 2009

**Figure 3.** Unemployment rate in Portugal



Source: OECD – Key Economic Indicators (KEI)

### 3.3. DATA

Our data were obtained from an annual survey (*Quadros de Pessoal*, hereafter QP) from GEP of the Ministry of Labour and Social Solidarity (MTSS) since 1982<sup>8</sup>. This is a comprehensive survey covering all firms with wage earners in Portugal and its longitudinal dimension allows firms to be followed over time, as firms are identified with a single number. By working with the original raw data files at the firm-level from 1985 to 2007, it was possible to identify over 100.000 firms in each year. The data was provided by GEP<sup>9</sup> - MTSS.

What makes this data source really unique and particularly valuable from the point of view of the analysis of foreign entry and exit is that, among other data, the survey records the share of equity held by non-residents, allowing the computation of estimates on the importance of foreign-owned firms in the Portuguese economy. For the classification of firms, the share of equity owned by foreign investors is a common criterion used in the literature for firms' discrimination. Some studies consider as FDI a foreign participation of, at least, 10%. In our study, we classify a firm as foreign if its share of equity owned is, at least, 50%. This participation level is also commonly used on studies at microeconomic level (e.g., Teixeira and Tavares-Lehmann, 2007) and ensures a significant level of foreign influence in domestic firms' operations.

However, despite these advantages, the database has also some limitations that should be made clear. First, we do not know the identity of the foreign owners. This is unfortunate because it prevents us from using the parents' characteristics, like the country of origin, to explain the behaviour of foreign firms. In addition, we could not control specifically for firms' exporting behaviour. Nonetheless, we have accounted for the export intensity of the industry in an attempt to overcome this data limitation. Thus, in addition to QP database, we have also used data on exports from National Institute of Statistics (INE), as well as on Gross Value Added from Bank of Portugal, both at 2-digit industry level, according to the International Standard of Industrial Classification (ISIC) rev 2, in order to

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<sup>8</sup> We acknowledge GEP for allowing the use of the original data. The data analysis, results and conclusions are of the author's own responsibility. GEP stands for *Gabinete de Estratégia e Planeamento* from Ministry of Labour and Social Solidarity. The Ministry was created on 1916 as Ministry of Labour and Social Welfare. Now it is called *Ministério do Trabalho e da Solidariedade Social* (MTSS) (Ministry of Labour and Social Solidarity).

<sup>9</sup> GEP – *Gabinete de Estratégia e Planeamento* (Strategy and Planning Office).

compute the export intensity of manufacturing industries. At the macroeconomic level, data on annual growth rate of Portuguese GDP was accessed through OECD (Country Statistical Profiles 2009). Although QP dataset is available for the period 1985 to 2007, we only have information on industries' exports since 1988, so the next descriptive analysis and the following empirical study used information for the period 1988 through 2007.

In what concerns firm size, we later distinguish between SMEs and LEs based on the European definition, according to which a firm is considered a SME if it employs fewer than 250 persons and if its annual turnover does not exceed 50 million euro or its balance sheet does not exceed 43 million euro<sup>10</sup>.

### **3.4. EVOLUTION TRENDS OF FOREIGN AND DOMESTIC FIRMS IN PMI**

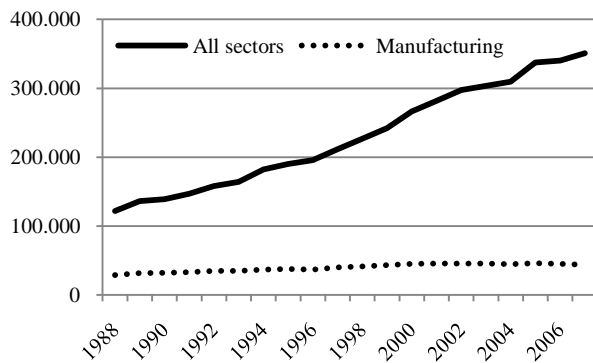
#### *3.4.1. ENTRY PATTERNS*

Between 1988 and 2007, the number of foreign firms (FF) and domestic firms (DF) located in Portugal grew in a considerable way as Figures 4 and 5 report, although the growth had been greater in the foreign case. During this period, the average annual growth rate was about 8.2% in FF and 5.8% in DF. Overall, the trend in new firm creation is clearly positive for both groups of firms, despite a slight lessening in the growth of foreign entries during the downturn periods. The concentration of firms in manufacturing industry has been decreasing during the last decades, inversely to wholesale and retail sectors. In 1988, almost 38% of FF and 24% of DF were operating in Portuguese manufacturing industry. In 1995, the respective shares had fallen to 28% and 20%, and more recently, in 2007, just 20% of FF and 12% of DF were focused in Portuguese manufacturing.

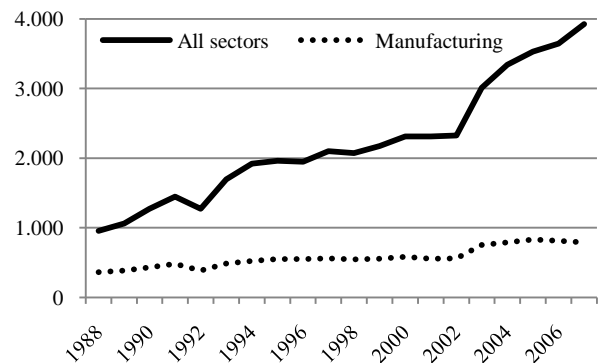
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<sup>10</sup> Available at: [http://ec.europa.eu/enterprise/enterprise\\_policy/sme\\_definition/sme\\_user\\_guide\\_pt.pdf](http://ec.europa.eu/enterprise/enterprise_policy/sme_definition/sme_user_guide_pt.pdf)

**Figure 4.** Total number of DF

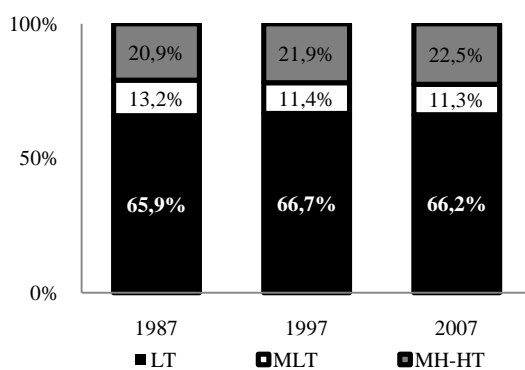


**Figure 5.** Total number of FF

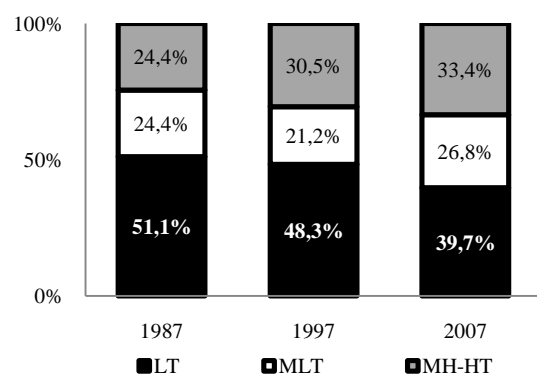


Next figures summarize the distribution of FF and DF over the different industries, according to distinct levels of technological complexity<sup>11</sup>. In opposition to FF, which have been reallocating themselves from low-tech industries towards more technology intensive ones, DF still remain strongly concentrated in sectors requiring labour intensive activities and low levels of technological complexity. This dissimilarity may suggest a higher ability to overcome entry barriers and to conduct innovative activities in favour to FF.

**Figure 6.** Distribution of DF by Technological Complexity



**Figure 7.** Distribution of FF by Technological Complexity

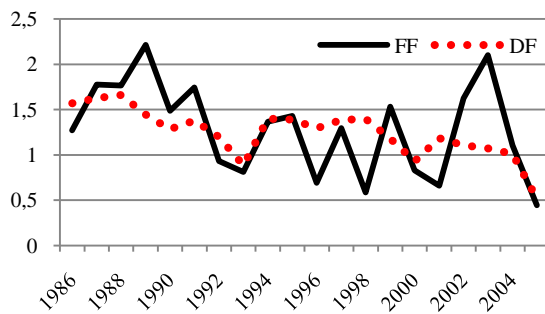


<sup>11</sup> The analysis of the level of technological complexity was based on OECD classification (LT: Low Tech Industries; MLT: Medium-Low Tech Industries; MH-HT: Medium-High/High Tech Industries). Due to the high level of aggregation in economic activities present in “Quadros de Pessoal” database, Medium-High and High Technology Industries were joined in the analysis.

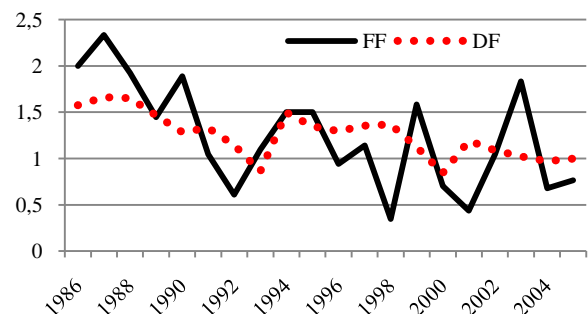
Owing to the longitudinal dimension of QP database, we can follow individual firms over time and compute entry and exit measures by ourselves<sup>12</sup>. Such process enabled us to track 121.402 new firms over the period 1986-2005 (1.045 FF and 120.357 DF) and the identification of 98.959 exits during the same period, from which 846 corresponded to foreign closures. Figures 8 to 11 illustrate the evolution of open to closure ratio (O/C Ratio), first in aggregated Manufacturing Industry and then in different industries according to their technological complexity.

The statistics reflect a more stable evolution of the ratio corresponding to DF, regardless the industry. In addition, the ratio for DF was almost always higher than one, reflecting a greater number of openings than closures. In contrast, FF were responsible for the highest, but also the lowest, ratios.

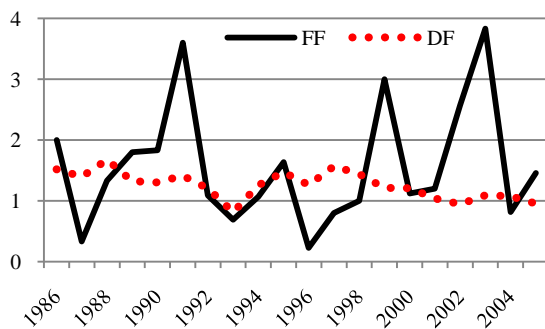
**Figure 8. O/C Ratio in Manufacturing**



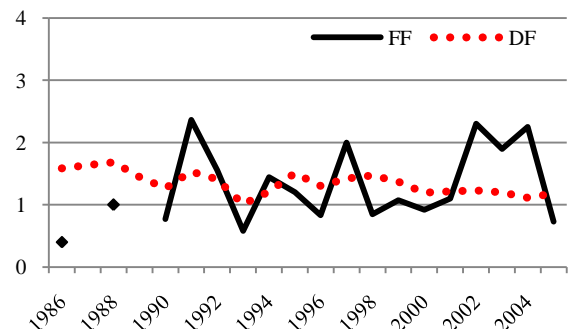
**Figure 9. O/C Ratio in Low Tech Industries**



**Figure 10. O/C Ratio in Medium-Low Tech Industries**



**Figure 11. O/C Ratio in Medium-High/High Tech Industries<sup>13</sup>**



<sup>12</sup> Detailed explanation on the computation of entry and exit occurrences in the database will be presented in Chapter 5.

<sup>13</sup> The missing data in the figure means that there were no shutdowns in 1987 and 1989 among foreign subsidiaries operating in medium-high/high technology sectors.



Regarding the industries entered, some differences among foreign and domestic entrants were also noted. In order to compare the attributes of the industries entered by new firms according to their ownership, some t-tests on the statistical significance of differences were performed. The results corroborate those ones already obtained in previous studies conducted for Portugal with data for later 80s and early 90s (e.g., Mata and Portugal, 2002, 2004). Foreign entrants prefer industries where concentration<sup>14</sup> is higher, where minimum efficient scale<sup>15</sup> is larger and with stronger foreign presence<sup>16</sup>. The differences found in industries attributes between foreign and domestic entrants were frequently significant at 1% level. In addition, domestic firms seem to choose more often industries with higher entry rates<sup>17</sup>, a fact in line with their preference for industries with higher competition levels and lower concentration. The industry growth rate<sup>18</sup> was also analyzed, but the differences were not so evident. Since the late 90s, foreign entrants have been choosing industries with higher growth rates, but the differences were rarely significant.

#### *3.4.2. THE RELATIVE IMPORTANCE OF FOREIGN FIRMS IN PMI*

The figures below illustrate the evolution of FF's share in the total number of firms operating in PMI over the period under observation. In aggregate terms, the average share was 1,4%, despite some weakens have been detected namely during the economic slowdowns. Over the whole period, low-tech industries were those where FF were less important in relative shares (just 1%), in contrast to medium-low tech industries, where foreign subsidiaries have gained increasing expressivity (accounting for, on average, 2.8% of total number of firms).

Foreign firms have also been presenting a growing share in total employment, as well as in total sales, namely in high technology intensive sectors, as next figures confirm. Over the period 1988-2007, the average share of foreign firms was 11,6% in

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<sup>14</sup> Industry concentration was measured by computing the Herfindhal Index of concentration, in terms of employment.

<sup>15</sup> Proxied by the median value of 2-digit industry's employment.

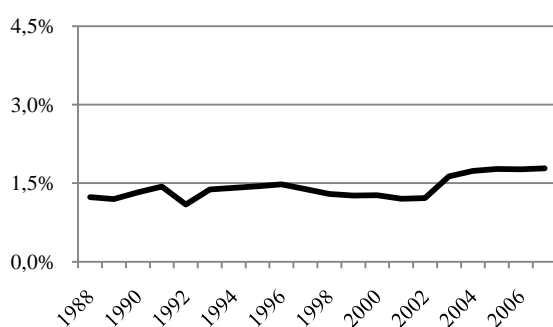
<sup>16</sup> Foreign presence was measured by the share of FF in total employment in the 2-digit industry.

<sup>17</sup> Entry rate refers to the ratio of the number of entrants in year t to the total number of existing firms in t.

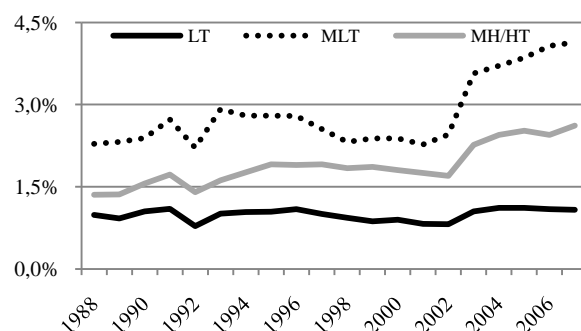
<sup>18</sup> Computed through the difference, in logs, of total employment in 2-digit industry between t and t-1.

manufacturing employment and 20% in the total manufacturing sales turnover. Moreover, the average shares registered by FF in the most technologically complex sectors were, respectively, 23% and 38,8%, validating their importance in more advanced industries. The reasons for that concentration may be associated to the results of Mata and Portugal (1999, 2002, 2004), Barbosa et al. (2004) and Geroski et al. (2010), whose studies revealed that FF prefer sectors where entry barriers are important. Such a presence from foreign multinationals' affiliates may contribute to the regeneration and modernization of Portuguese industrial production, supporting a structural change towards technologically more complex exports (Freitas and Paes Mamede, 2008). Nonetheless, macroeconomic conditions seem to exert an impact on FF's contribution to such a modernization. Recessive periods were described by evident attenuations in foreign shares, namely during the early 1990s recession, both in total employment and total turnover.

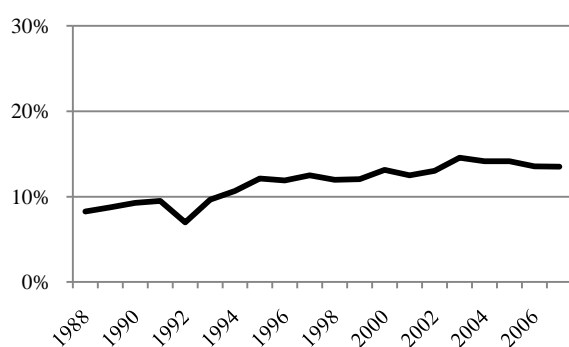
**Figure 12.** Share of FF in total number of firms



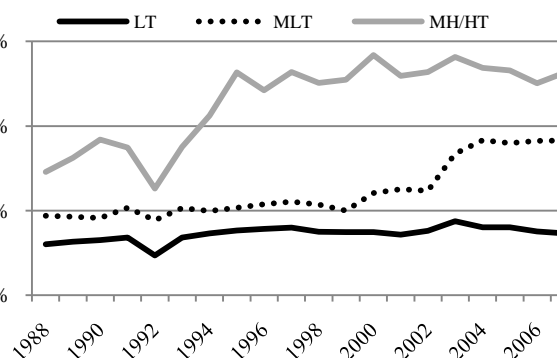
**Figure 13.** Share of FF in total number of firms by technological complexity



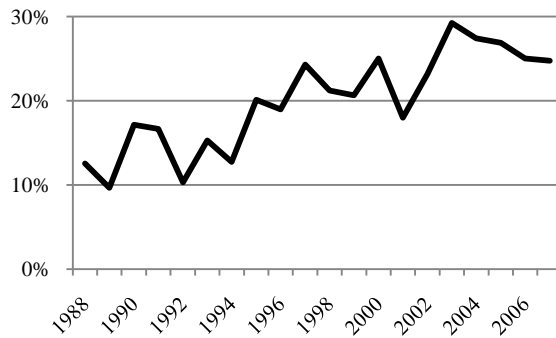
**Figure 14.** Share of FF in total employment



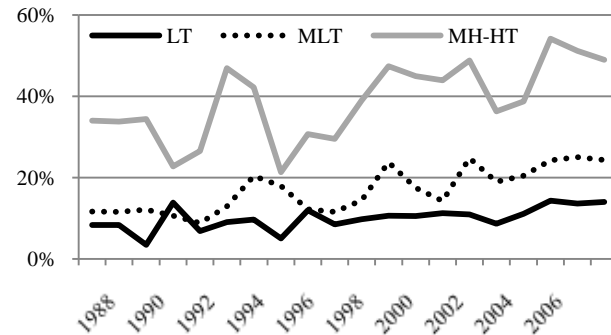
**Figure 15.** Share of FF in total employment by technological complexity



**Figure 16.** Share of FF in total turnover



**Figure 17.** Share of FF in total turnover by technological complexity



### 3.4.3. SIZE, SCALE AND AGE

The following data confirms the widespread belief highlighted in the literature related to foreign superiority in terms of size and scale<sup>19</sup>. All over the time, FF largely overcame the scale of operations of their domestic counterparts, both at employment and turnover levels. During the last decades, both groups of firms have been reducing their average level of employment, in contrast to their average turnover, which has been presenting a positive evolution, mainly for FF. These opposite trends let us foresee a positive evolution on labour productivity levels, probably associated to the mechanization of production processes, especially in more technology intensive industries and, so, less labour demanding.

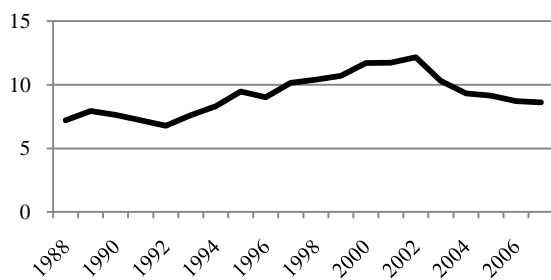
Figures 18 and 19 illustrate the relative superiority of FF over DF at both scale variables. During the period illustrated, FF presented an average size between 7 and 12 times larger than DF at employment levels. Regarding sales turnover, FF operated at a scale between 9 and 26 times larger than domestic-owned enterprises. The differences were always statistically significant at 1% level, after performing t-tests for both variables and every year. Curiously, the gaps between the two groups presented slight reductions during and/or after recessive periods in Portuguese economy. Concerning their average age, FF were often older than DF, presenting an average of 34 years, in opposition to DF's average age of 21 years.

<sup>19</sup> Confirm Table 4 in Section 2.5.2.

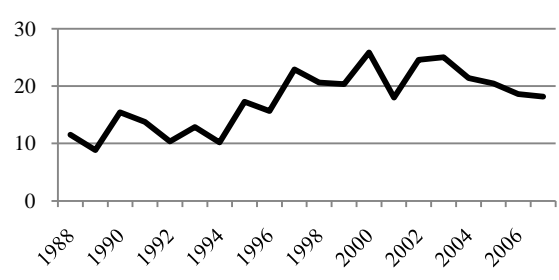
**Table 7.** Evolution of average employment and turnover

	1987	1992	1997	2002	2007
<b>Average Employment (number of employees)</b>					
FF	223	171	186	184	124
DF	30	25	18	15	14
<b>Average Turnover (€1.000)</b>					
FF	7.338	10.526	18.838	24.200	22.295
DF	1.476	1.015	823	985	1.228

**Figure 18.** Ratio FF's employment to DF's employment



**Figure 19.** Ratio FF's turnover to DF's turnover



#### 3.4.4. OPERATIONAL PERFORMANCE<sup>20</sup>

Labour productivity, as the ratio of firms' total sales to respective total employment (turnover per employee), is commonly used as a measure of operational performance<sup>21</sup>. Despite some disadvantages pointed in the literature<sup>22</sup>, labour productivity measures present some other advantages, as these are less data sensitive measures, imposing very few theoretical restrictions and do not relying on measures of, for instance, capital stock, which are likely to be affected by measurement errors (Criscuolo, 2005). Additionally, Blömstrom and Sjöholm (1999) argue that labour productivity is a complete measure of operational performance, being a function of capital-labour ratio, skill level of the labour force, capacity utilization, economies of scale, ownership and various industry

<sup>20</sup> This is a measure of employees' productivity and may be applied in comparative analyses between firms within the same industry. However, low values may represent a labour-intensive industry and high values may be associated to capital-intensive industries.

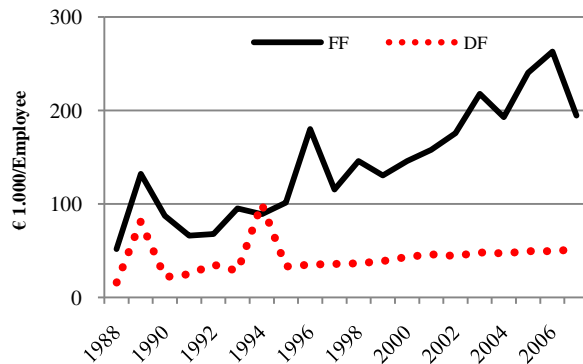
<sup>21</sup> See Table 1 in Section 2.2.

<sup>22</sup> For instance, Criscuolo (2005) points out that labour productivity only measures the efficiency of one of the inputs to production and thus we cannot distinguish whether an increase in productivity is due to an improvement in efficiency or an increase in capital stock.

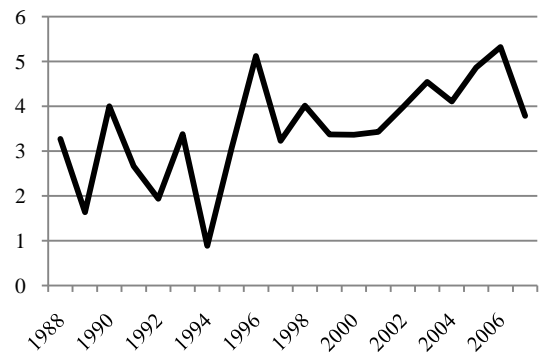
specific factors. In our case, QP database does not provide any financial variable allowing other measurement of firms' performance, since the data were originally designed to collect information on labour market.

As previously stated in Section 2.2, a largely debated issue on IB literature relates to the significance of performance gaps often arising from comparisons between DF and FF. Unconditional on firms' characteristics, the data on Portuguese case suggests that an increasing gap exists between such groups, concerning operational performance levels, as illustrated by figures 20 and 21.

**Figure 20.** Evolution of operational performance



**Figure 21.** Ratio FF's operational performance to DF's operational performance

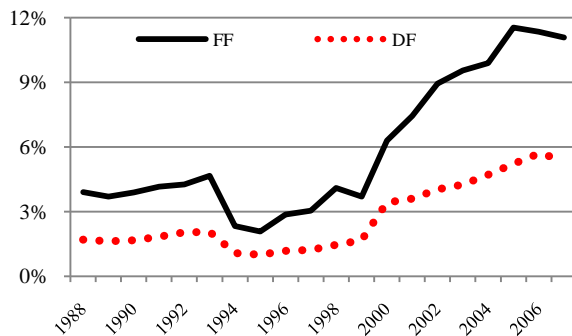


Operational performance was always higher for FF, except in 1994. In addition, the average difference between foreign and domestic operational performance was always statistically significant at 1% level, except in 1989 and 1994, when t-tests revealed no significant difference. The gap between both groups seems to be increasingly larger since the middle 1990s, with FF presenting average operational performance levels about 4 times larger than those of DF. However, these results must be accurately analyzed, since performance gaps may be a mere statistical artifact as a significant branch of the literature has already confirmed (e.g., Barbosa and Louri (2005) for Portugal and Karlsson et al. (2009) for China).

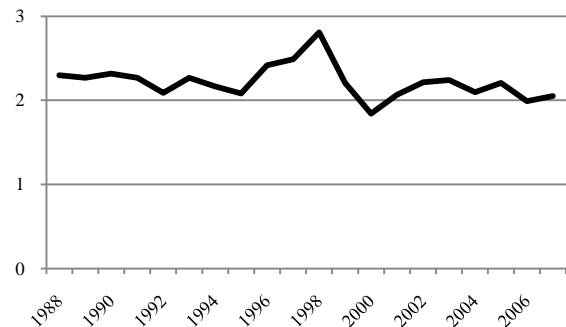
### 3.4.5. HUMAN CAPITAL

The quality of the workforce, in terms of skills and qualifications of employees, is another dimension where foreign and domestic firms more often differ. Human capital levels may be viewed as an increasingly competitive factor at the firm-level, exerting as well an important role upon firms' evolution and growth (e.g., Teixeira, 2002). Despite several measures can be used to proxy the human capital of firms (e.g., average wages, average school years of the workforce, among other measures), in this study we proxy the firm's human capital by the share of college graduates in firm's total employment. Similar measures of firm's human capital levels were chosen by Mata and Portugal (1999, 2002, 2004), also using QP database. Figure 22 depicts the evolution of these shares for foreign and domestic firms. The ratio between both shares is illustrated in figure 23.

**Figure 22.** Proportion of workers with a college degree



**Figure 23.** Ratio FF's human capital to DF's human capital



From the above results, we observe a positive trend in human capital in both groups of firms, as well as a significant distance between DF's and FF's levels. The average share of college graduates in the firms' workforce was 5.9% in FF over the whole period, in opposition to the share of 2.7% in DF. The ratio of FF's to DF's human capital shows that foreign firms presented, on average, a proportion of highly qualified workers about 2.2 times greater than Portuguese firms, and t-tests revealed that the disparity found at human capital levels was statistically significant at 1% level. These conclusions corroborate those ones of Almeida (2003), whose study, applied to PMI for the period of 1991-1998, found that FF had a proportion of low educated workers 7 percentage points

lower than DF. Moreover, those differences remained even after controlling for region and sector composition, as well as size and age of firms. Accordingly, these differences must be properly accounted for, in order to isolate the pure ownership effect upon firm performance, growth and survival.

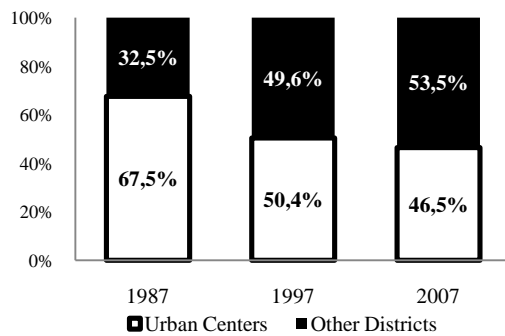
#### 3.4.6. GEOGRAPHICAL LOCATION

Finally, a last comparative dimension between FF and DF is their location patterns throughout the country, namely their geographical focus in urban centers. Geographic location of firms may matter for their performance evolution, growth patterns and survival prospects. More rural locations are often less developed and may lack diversity of resources, though can enable the firms to exploit a niche with limited competition. Conversely, urban locations often contain a wealth of varied resources, but firms at these locations may also have to face greater competition and higher costs related to diseconomies of agglomeration (Stearns et al. 1995; Fotopoulos and Louri 2000; Littunen 2000).

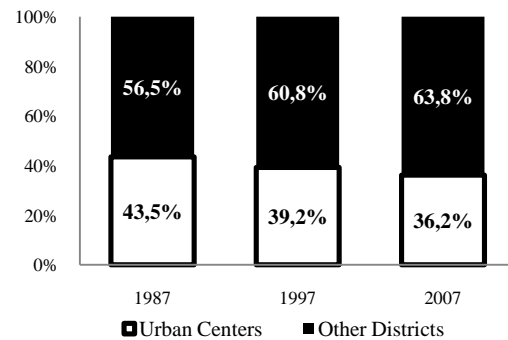
We follow Guimarães et al. (2000) by classifying the districts of Porto and Lisbon in the coastal side of Portugal as urban centers, where in fact the greatest part of foreign investments has been concentrated. Figures 24 and 25 illustrate the distribution of foreign and domestic firms over urban centers and the remaining districts in the country.

The results confirm the strong, though decreasing, focus of foreign firms in urban locations, where better infrastructures, services and networks can be more easily found. Actually, in the late 1980s, more than 2/3 of FF chose the Portuguese urban centers to operate (44% in Lisbon and 23% in Porto). In contrast, the more recent data show that less than 50% of FF is located in such areas, so that they have been reallocating themselves to the other districts, which have also become more developed and richer in services and resources over the years. In opposition, DF were mostly and increasingly concentrated in *less urban* regions, also preferring Porto over Lisbon to operate (in 1987, 27% of DF were located in Porto and only 17% in Lisbon; in 2007, the shares were respectively 24% and 13%). Despite the disadvantages in terms of scarcer resources, DF may have also profited from lower competition in these districts, mainly from their foreign counterparts.

**Figure 24.** Location of FF in urban centers



**Figure 25.** Location of DF in urban centers



### 3.5. EVOLUTION TRENDS OF SMALL AND LARGE FIRMS IN PMI

#### 3.5.1. THE RELATIVE IMPORTANCE OF SMALL AND LARGE FF IN PMI

After an analysis of evolution trends of FF in PMI, this section deepens the previous appraisal of data by separating foreign-owned firms into foreign SMEs and foreign LEs, establishing also a comparison between them and DF of both size categories<sup>23</sup>.

Regarding the relative importance of small and large FF in PMI, next figures illustrate their shares in total number of firms, employment and turnover<sup>24</sup>. By observing the evolution of FF's shares, we conclude that despite foreign SMEs have been accounting for a higher weight in total number of firms (on average, foreign SMEs corresponded to 1.15% of total firms, while foreign LEs were just 0.3% of enterprises in PMI), larger subsidiaries have been prominent in securing employment and turnover.

In fact, despite their irrelevant influence in number, foreign large-sized firms were responsible for 8.1% of total employment and 15.4% of total sales in manufacturing industry over the period 1988-2007. The corresponding shares of foreign SMEs were 3.5% and 4.5% for the same period of time. Both sets of foreign affiliates have however been increasing their positions in Portuguese industries, though the gap between small and large

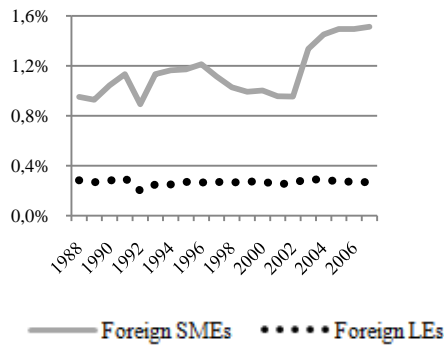
<sup>23</sup> The distinction between SMEs and LEs is based on the European definition, according to which a firm is considered a SME if it employs fewer than 250 persons and if its annual turnover does not exceed 50 million euro or its balance sheet does not exceed 43 million euro

<sup>24</sup> For an aggregated view of FF's shares, remember Figures 12, 14 and 16, respectively. For an aggregated view of SMEs' shares (foreign and domestic), similar figures are presented in the Appendix G (page 126).

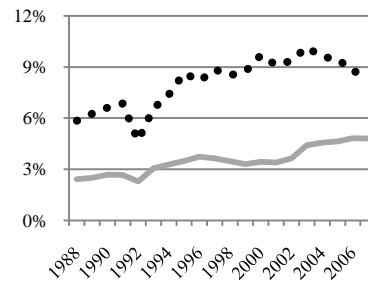


FF has also becoming greater. In addition, as we had already stated with more aggregated data, recessive periods seem to have exerted a negative impact upon foreign shares. Foreign SMEs appear to have suffered higher declines in their total firms' shares during economic downturns, while greater declines at employment and turnover shares were more visible among foreign large-sized companies. This preliminary analysis of data may thus suggest that small and large FF may have behaved differently during economic recessions suffered by Portuguese economy. In other words, firm size may have acted as a moderating factor of foreign ownership effect during crises.

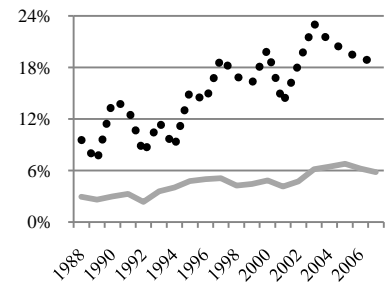
**Figure 26.** Share of FF in total number of firms



**Figure 27.** Share of FF in total employment



**Figure 28.** Share of FF in total turnover



### 3.5.2. SIZE, SCALE AND AGE

Table 8 summarizes the main differences at the scale of operations between FF and DF of different size classes. In section 3.4.3 we had already stated that FF are larger than DF, either concerning the number of workers employed or the level of annual sales turnover. Now, the disaggregation of FF and DF into SMEs and LEs leads to the conclusion that the main differences at size and scale are found between foreign SMEs and domestic SMEs. In opposition, larger FF and DF had more similar scales of operation throughout the period.

Figures 29 and 30 illustrate the movement of the FF/DF ratio both at employment and turnover, for the groups of SMEs and LEs. On average, foreign SMEs were about 4 times larger than domestic SMEs regarding employment levels, and 8 times larger at

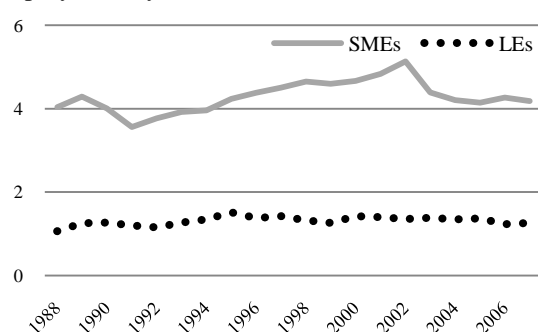
turnover. Conversely, the average FF/DF ratios among larger enterprises were, respectively, about 1.3 and 1.4, suggesting that foreign ownership was not so significant for LEs, at least concerning the differences at operational scale.

**Table 8.** Evolution of average employment and turnover by size class

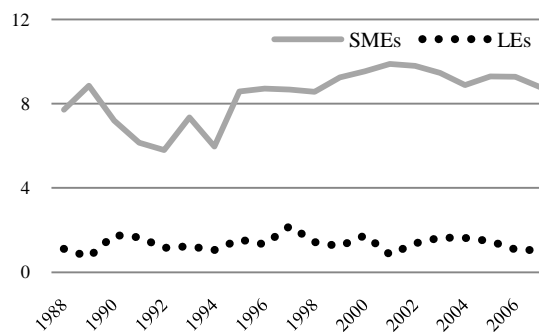
		1987	1992	1997	2002	2007
<b>Average Employment (number of employees)</b>						
SMEs	FF	83	69	67	66	52
	DF	20	18	15	13	12
LEs	FF	695	623	678	612	531
	DF	593	539	477	451	421
<b>Average Turnover (€1.000)</b>						
SMEs	FF	2.627	2.929	4.930	6.323	6.203
	DF	299	512	569	646	707
LEs	FF	23.102	43.900	76.510	88.803	113.004
	DF	63.298	38.201	35.012	64.997	109.011

Regarding the average age of firms, foreign firms were often older than their domestic counterparts as previously stated, though we denote again greater dissimilarities within the group of SMEs. Foreign SMEs were, on average, 27 years in operation, in opposition to 18 years for domestic SMEs. For larger firms, the average age was about 40 years for FF and 35 years for DF.

**Figure 29.** Ratio FF's employment to DF's employment by size class



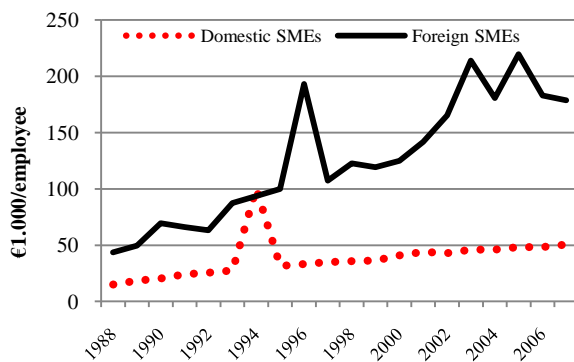
**Figure 30.** Ratio FF's turnover to DF's turnover by size class



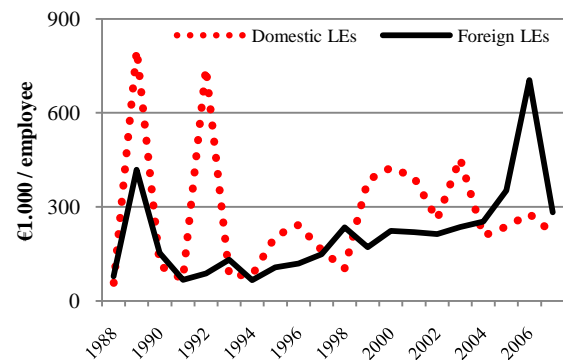
### 3.5.3. OPERATIONAL PERFORMANCE

Figures 31 and 32 depict the evolution of operational performance of FF and DF, according to their respective size class. Such a disaggregation between smaller and larger enterprises reveals that the performance gap formerly observed in Figure 20 has mainly occurred between foreign SMEs and domestic SMEs. More precisely, the average ratio FF's operational performance to DF's operational performance was about 3.38 for the group of SMEs and just 1.02 within larger enterprises, which seemed to have performed more similarly over the two decades under study. On the other hand, the performance gap observed between foreign and domestic SMEs has becoming greater since the mid-1990s, which had contributed to the superiority of foreign-owned firms that we have detected in Section 3.4.4.

**Figure 31.** Operational Performance of SMEs



**Figure 32.** Operational Performance of LEs

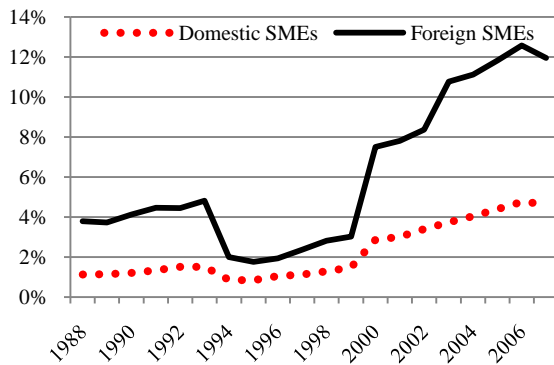


### 3.5.4. HUMAN CAPITAL

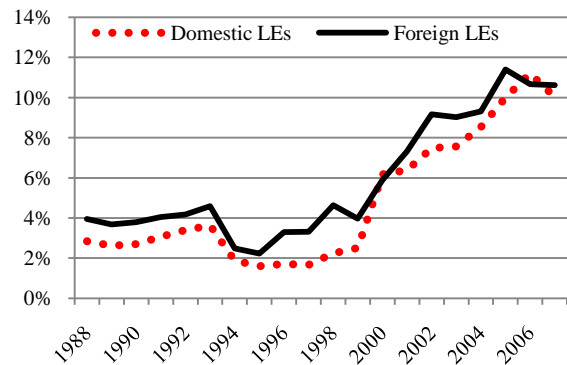
Human capital is over again evaluated for the samples of FF and DF, now separated into SMEs and LEs. Figures 33 and 34 illustrate the evolution of the proportion of college graduates in FF and DF of different size classes. The statistics reveal that foreign superiority turns out to be higher among SMEs than within the group of LEs. Foreign SMEs presented, on average, 6.1% of graduated employees, in opposition to the weaker share of 2.3% for domestic SMEs. Among LEs, the corresponding shares were 5.9% for FF and 4.9% for DF.

These results confirm the previous evidence on FF's advantages over DF at human capital levels, and furthermore reveal that such superiority can be even greater among the set of smaller and medium firms. In fact, foreign SMEs very often exhibited higher levels of human capital than larger subsidiaries, which again makes us suspect that possible differences may be found between foreign SMEs' and foreign LEs' behaviours during turbulent periods. In addition, the data also shows the debilities of smaller domestic firms at human capital intensity, claiming for the attention of governments and for policies more focused on the upgrading of domestic skills and competencies, and thus reducing the gap that persists even against the smaller FF.

**Figure 33.** Proportion of workers with a college degree in SMEs



**Figure 34.** Proportion of workers with a college degree in LEs



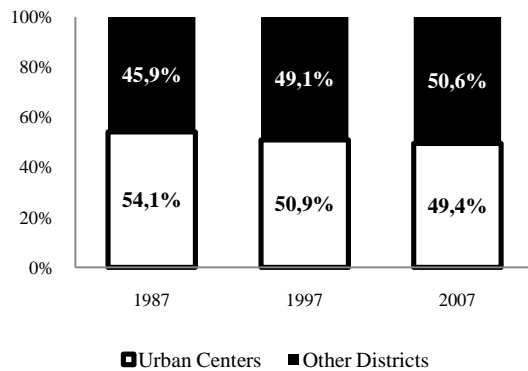
### 3.5.5. GEOGRAPHICAL LOCATION

Finally, regarding the location at urban centers of Porto and Lisbon previously discussed for the broad groups of FF and DF, we now distinguish the same patterns for SMEs and LEs. Overall, we still conclude that foreign firms (both smaller and larger) tend to be more concentrated in *more urban* areas. Despite in the late 1980s this preference was more evident among larger FF, the differences were attenuated over the time, so that in 2007 the shares of FF located in urban centers were very similar for smaller and larger enterprises, as figures below confirm.

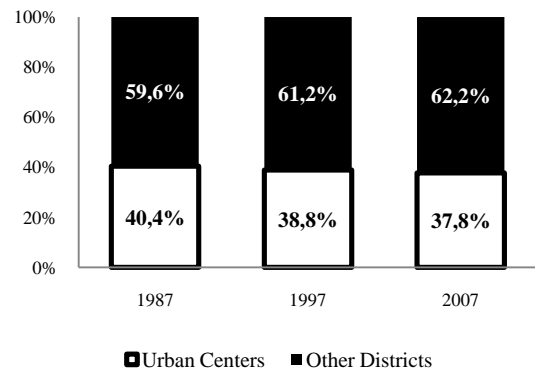
Conversely, the differences were greater among domestic SMEs and domestic LEs. The results show over again that domestic firms (both small and large) are less

concentrated in urban centers, compared to FF of both size classes. Moreover, we now see that smaller DF are even more focused in other regions than Porto and Lisbon, which may lack the more sophisticated resources, infrastructures and/or resources, while larger DF are more equally dispersed among urban and *less urban* areas.

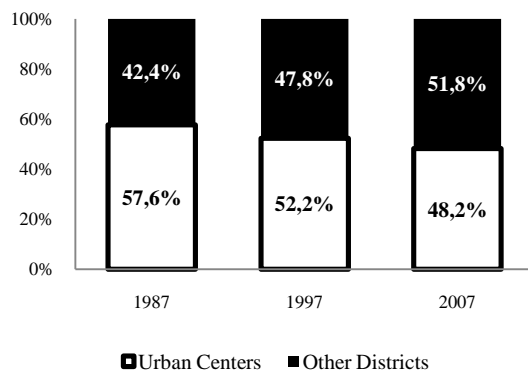
**Figure 35.** Location of foreign SMEs in urban centers



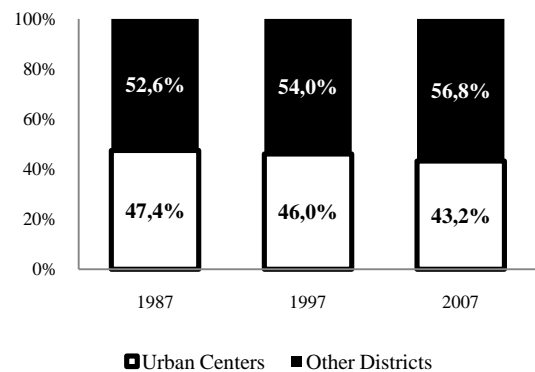
**Figure 36.** Location of domestic SMEs in urban centers



**Figure 37.** Location of foreign LEs in urban centers



**Figure 38.** Location of domestic LEs in urban centers



### 3.6. CONCLUDING REMARKS

The literature suggests that foreign ownership is an important source of firm heterogeneity affecting performance and survival dynamics (see Tables 1 and 2). However, the potential impact of FDI in host economies depends not only on the quality of the investments, but also on the way they evolve over time. For the Portuguese case, and more precisely for PMI, we found foreign subsidiaries to be relatively larger, more productive,

technologically more advanced, richer regarding human capital and more concentrated in urban regions, when compared to domestic firms. This is likely to alter the patterns of jobs, to expand specialized and highly skilled employment, to increase the competitiveness of industries and maybe to stabilize the economy during economic downturns. However, a deeper analysis controlling for these firm-level and industry-level differences found between foreign and domestic firms are needed, in order to evaluate if any significant effect can be attributed to foreign ownership *per se*.

In the next chapters, we will empirically assess the determinants of firms' employment growth, sales turnover growth and hazard rates, specially attending on the foreignness effect, overall and during recessions. In this chapter we have identified several firm-level and industry-level characteristics which are likely to affect the dynamics of firms, as well as the foreign ownership impact on those specific firm-level variables. Accordingly, our subsequent empirical analysis will properly account for them.

## CHAPTER 4<sup>25</sup>

### ECONOMIC SLOWDOWNS AND FIRM PERFORMANCE: DO FOREIGN AND DOMESTIC FIRMS BEHAVE ANY DIFFERENT?

#### 4.1. INITIAL CONSIDERATIONS

This chapter examines the link between foreign ownership, employment growth and turnover growth<sup>26</sup> at the firm-level. More precisely, the comparative response of foreign multinationals and domestic firms in Portugal during the two economic slowdowns previously identified are assessed, in order to conclude whether foreign firms reacted to the economic recessions differently than did domestic firms and, if that was the case, whether they acted as (un)stabilizer agents. Accordingly, two main research questions will be addressed: first, does foreign ownership helps to differentiate firm performance overall and during periods of crisis? And second, how does firm size interfere with the foreign ownership effect?

Next the methodology to be applied and the variables to be included in our estimations are presented, followed by some preliminary statistics and finally the empirical results and the respective discussion.

#### 4.2. METHODOLOGICAL ISSUES

Our empirical strategy went through three main steps. First, we investigated if foreign ownership affected firm performance / firm growth (measured by employment

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<sup>25</sup> This chapter is a modified version of the article “Do foreign and domestic firms behave any different during economic slowdowns?”, published in *International Business Review* (doi:10.1016/j.ibusrev.2010.06.001). We acknowledge the valuable comments of two anonymous referees from IBR.

<sup>26</sup> Employment growth and sales turnover growth are frequently used as measures of firm growth and performance. Turnover and sales are frequently used interchangeably in the literature (Coad, 2009; Bamiatzi, Bozos and Nikolopoulos, 2010).

growth and sales turnover growth) during recessions. To reach this purpose, we used a similar equation to that used by Álvarez and Görg (2007):

$$\ln(Y_{it}) - \ln(Y_{it-1}) = \alpha_i + \mathbf{Z}'_{it}\delta + \gamma_1 Own_{it} + \gamma_2 Down + \gamma_3 Own_{it}*Down + \varepsilon_{it} \quad (1)$$

where  $Y$  is the *proxy* for growth of firm  $i$  in each time period, corresponding to employment growth in a first specification and to sales turnover growth in a second specification. These variables are measured by the log difference in employment (and sales turnover) in firm  $i$  between  $t$  and  $t-1$ .

A dummy variable -  $Own$  - allows distinguishing between FF and DF, and  $Down$  is a dummy for the periods of recession. The overall effect of economic recessions is given by  $\gamma_2$ , which is expected to be negative. The equation evaluates the impact of being foreign-owned during recessions through an interaction term -  $Own*Down$ . If FF are more able to absorb recessions, the growth in these firms should be higher than for DF in the recession period, and, in that case,  $\gamma_3$  will be positive and significant. If  $\gamma_3$  is negative, then FF contract more than DF during the crisis. If  $\gamma_3$  is zero or non-significant, it indicates that there are no differences in the response between foreign and domestic firms.

$\mathbf{Z}$  is a vector of firm's and industry's characteristics which are likely to affect the dependent variables, according to the literature. A detailed description of these variables is presented in Table 9. We do not develop specific hypotheses regarding their effects but we will control for them. In particular, we include age and size, as both have been found in the literature to explain firm growth (Evans, 1987; Dunne and Hughes, 1994). We introduce the square of both variables, since their impact may be non-linear (Cardoso, 2008).

Labour productivity and firm's human capital characteristics may affect firms' performance, so they must also be accounted for. We recall that FF are normally found to be more productive and more capital intensive than DF (Álvarez and Görg, 2007, 2009). Firm location in urban centres may also impact upon firm growth and, as we previously observed, foreign MNEs are agglomerated in the principal cities, aiming to profit from urbanization externalities (Guimarães et al., 2000). Industry attributes are also controlled for, namely minimum efficient scale, industry concentration, industry growth, export intensity and foreign presence, which are the main industry-level variables commonly found in the literature to influence firm performance over time (e.g., Barbosa and Louri, 2005; Álvarez and Görg, 2007; Cardoso, 2008).



Considering the likely moderating effect of firm size upon foreign ownership, we run equation (1) using, separately, the whole sample and the samples of SMEs and large enterprises. Our exploration of the size effect led us to estimate a second equation where all the variables are the same as in equation (1), with the exception of the interaction variables.

$$\ln(Y_{it}) - \ln(Y_{it-1}) = \alpha_i + \mathbf{Z}'_{it}\delta + \gamma_1 \text{Own}_{it} + \gamma_2 \text{Down} + \gamma_3 \text{Size}_{it} * \text{Down} + \gamma_4 \text{Size}_{it}^2 * \text{Down} + \varepsilon_{it} \quad (2)$$

In equation (2) we test the effect of size, instead of foreign ownership, during recessions (through the interaction terms  $\text{Size}_{it} * \text{Down}$  and  $\text{Size}_{it}^2 * \text{Down}$ ). Since the relation between size and firm growth is frequently found to be non-linear we included the variable  $\text{Size}_{it}^2$ . Finally, we estimate an equation for the sample of FF, in order to investigate further the role of size within the group of MNEs' affiliates under recessions.  $\mathbf{Z}$  is the same vector of firm's and industry's characteristics, but we test if being large-sized matters for differentiating among FF and how it matters during recessions (through the terms  $\text{Large}_{it}$  and  $\text{Large}_{it} * \text{Down}$ ):

$$\ln(Y_{it}) - \ln(Y_{it-1}) = \alpha_i + \mathbf{Z}'_{it}\delta + \gamma_1 \text{Large}_{it} + \gamma_2 \text{Down} + \gamma_3 \text{Large}_{it} * \text{Down} + \varepsilon_{it} \quad (3)$$

We applied panel data models<sup>27</sup> to estimate all the above equations and, specifically, the suitability of within-groups and between-groups estimators. For all the estimations, Hausman test rejected the hypothesis of null covariance between the regressors and the individual effects, thus fixed effect estimators proved to be the most appropriate, being unbiased, consistent and asymptotical normal. In addition, our estimations were always applied to all firms in operation every year. Albeit many empirical studies often select a sample of only surviving firms, such a choice may bias the results in favour of foreign-owned firms if they present higher survival probabilities, leading to the conclusion that foreign ownership has a significant explanatory power upon firm performance measures (e.g., Álvarez and Görg, 2007). To avoid such a bias, we included in our estimations surviving and non-surviving firms during the period under analysis,

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<sup>27</sup> Panel data models allow assessing firm growth measures longitudinally, rather than cross-sectionally. The literature points that cross-sectional measurement of firm performance is insufficient and that it should be measured longitudinally, due to the importance of time dimension (e.g., Pfaffermayr and Bellak, 2002; Hult et al., 2008).

which constituted an unbalanced panel. Estimations using a fixed-effects specification take this factor into account, so it does not represent any problem (Greene, 2008). All the estimations were performed using STATA 10.

**Table 9.** Description of Variables

CATEGORY	VARIABLES	DESCRIPTION	
Dependent Variables	Employment Growth	$\ln(\text{Employment}_t) - \ln(\text{Employment}_{t-1})$	
	Turnover Growth	$\ln(\text{Turnover}_t) - \ln(\text{Turnover}_{t-1})$	
Main Variables of Interest	Ownership	Dummy = 1 if, at least, 50% of the capital is held by foreign investors, 0 otherwise.	
	Large dummy	Dummy = 1 if the firm is large-sized (i.e. if it is not a SME), 0 otherwise.	
	Own*Downturn	Interaction variable measuring the effect of being a FF during downturns	
	Size*Downturn	Interaction variable between firm size and downturn periods	
	Size <sup>2</sup> *Downturn	Interaction variable between the square of firm size and downturn periods	
	Large*Downturn	Interaction variable measuring the effect of being a large-sized firm during downturns	
Other variables	Firm-Level	Age	Number of years since the entry of the firm <sup>28</sup>
		Age squared	Squared number of years since the entry of the firm
		Size	$\ln(\text{number of employees})$
		Size squared	Squared value of $\ln(\text{number of employees})$
		Firm Performance	Operational Performance measured through the log of the ratio Turnover/Employment
	Industry-Level	Human Capital	Ratio Number of workers with a college degree/Total number of workers
		Urban	Dummy = 1 if the firm operates in the districts of Porto or Lisbon and 0 otherwise
		MES	Median of 2-digit industry's employment
		HH Index	Herfindhal Index – sum of the squared share of FF in total 2-digit industry's employment
		Industry Agglomeration	Share of 2-digit industry's employment in total Manufacturing employment
Macro-Level	Foreign Share	Share of FF's employment in total 2-digit industry's employment	
	Export Intensity	Ratio 2-digit industry Exports/2-digit industry VAB	
	Industry Growth	$\ln(2\text{-digit industry Employment}_t) - \ln(2\text{-digit industry Employment}_{t-1})$	
	Industry Dummies	Dummy = 1 for each 2-digit industry where the firm operates, 0 otherwise	
	Downturn	Dummy = 1 for the years 1991, 1992, 1993, 2001, 2002, 2003, 2007 and 0 otherwise	

<sup>28</sup> No data for the foundation year were available before 1994. As a result, for the computation of variable *Age*, we proxied the firm's foundation year through the year of admission of the former worker for each firm.

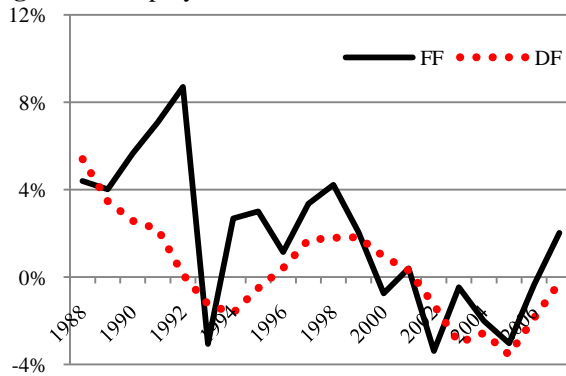
### 4.3. EMPIRICAL ANALYSIS

#### 4.3.1. PRELIMINARY STATISTICS

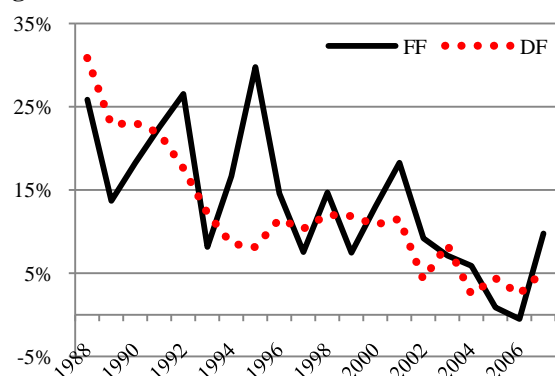
Figures 39 and 40 compare employment and turnover growth rates between domestic and foreign firms. FF's employment grew on average 1.8%, compared to a growth rate of 0.2% among DF. The impact of crises in employment is evident for both groups: FF registered a break of almost 12 percentage points in the employment growth rate between 1992 and 1993, and negative rates during the first half of 2000s. Domestic firms showed a similar but smoother evolution. However, FF seem to have reacted first and more abruptly, but, conversely, appear to have recovered faster.

In what concerns sales turnover, the average growth rates of turnover were 13% and 12% for foreign and domestic firms, respectively. There was a reduction in FF's sales by 18 percentage points between 1992 and 1993 and a persistent decline over the period 2001-2006. DF's turnover growth has declined all over the period under analysis.

**Figure 39.** Employment Growth



**Figure 40.** Turnover Growth



Figures 41 to 44 depict the same performance variables, discerning firms according to their size<sup>29</sup>. The distinction between SMEs and LEs is based on European definition, as previously explained.

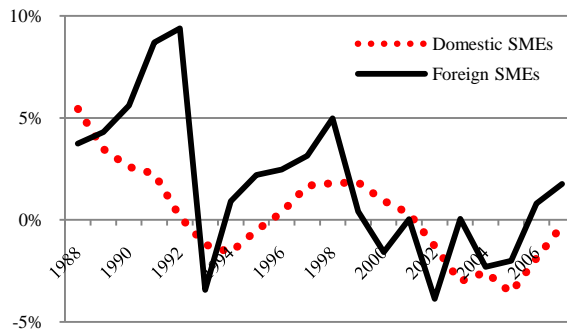
The graphs show that, unconditionally, FF were always more volatile than DF. During the early 1990s recession, large DF registered larger losses of employment while large FF registered largest declines in turnover instead. During the second slowdown, there

<sup>29</sup> Additional statistics regarding SMEs and LEs can be found in the Appendix F (page 126).

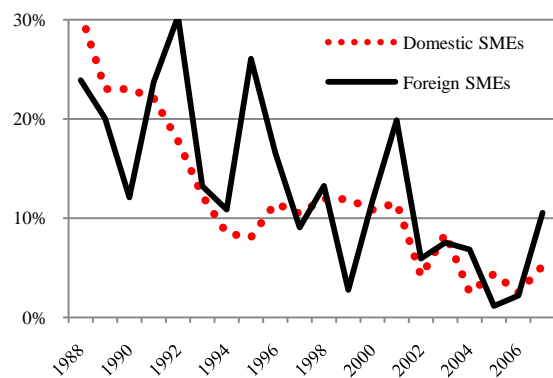
were larger job losses among SMEs (both foreign and domestic), while large FF also registered the largest declines in turnover.

These first statistics suggest that the cyclical downturns of Portuguese economy affected the growth of both sets of firms. In order to disentangle the effects of other covariates from the effect of foreign ownership and firm size, next we turn to an econometric estimation of the determinants of employment and turnover growth at firm-level. Table 10 presents the correlation coefficients between variables and no serious collinearity problems were detected.

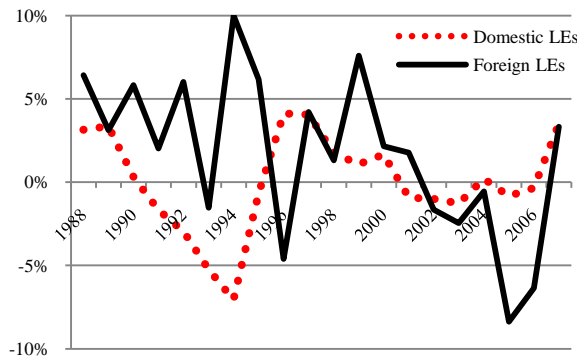
**Figure 41. Employment Growth in SMEs**



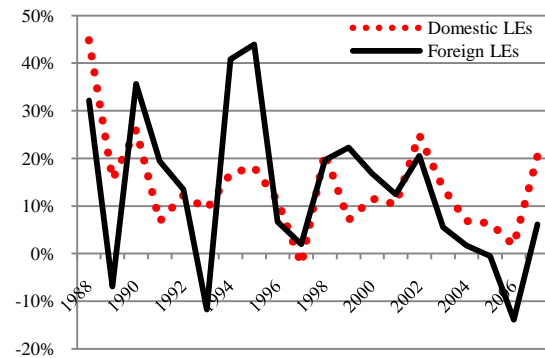
**Figure 42. Turnover Growth in SMEs**



**Figure 43. Employment Growth in LEs**



**Figure 44. Turnover Growth in LEs**



**Table 10.** Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	
Age	(1)																	
Age squared	(2)	0.09																
Size	(3)	-0.07	-0.08															
Size squared	(4)	-0.05	-0.06	0.94														
Firm Performance	(5)	0.00	-0.01	0.07	0.11													
Human Capital	(6)	-0.02	-0.02	0.03	0.04	0.19												
Ownership	(7)	-0.11	-0.11	0.33	0.50	0.08	0.03											
Urban	(8)	0.01	0.01	0.02	0.02	-0.03	0.05	-0.55										
Downturn	(9)	-0.08	-0.08	0.00	0.00	0.04	0.03	-0.01	0.00									
Own*Downturn	(10)	-0.01	-0.01	0.11	0.14	0.07	0.07	0.12	0.02	0.10								
Size*Downturn	(11)	-0.07	-0.08	0.38	0.35	0.06	0.04	0.12	0.00	0.77	0.19							
Size squared*Downturn	(12)	-0.05	-0.06	0.46	0.49	0.08	0.04	0.24	0.01	0.56	0.25	0.92						
MES	(13)	-0.04	-0.04	0.24	0.23	-0.23	-0.05	0.06	-0.03	0.00	0.02	0.09	0.12					
HH Index	(14)	-0.01	-0.01	0.04	0.04	0.05	0.04	-0.50	0.31	-0.01	0.01	-0.01	0.00	0.12				
Industry Agglomeration	(15)	-0.02	-0.02	0.13	0.13	-0.17	-0.05	-0.78	0.40	0.01	0.00	0.05	0.07	0.56	0.23			
Exports/VAB	(16)	-0.01	-0.01	-0.05	-0.03	0.13	0.05	-0.01	-0.04	0.03	0.02	0.00	0.00	-0.12	-0.08	0.48		
Industry Growth	(17)	-0.01	-0.01	0.03	0.03	-0.12	-0.02	0.01	0.05	0.02	0.00	0.03	0.02	0.13	-0.03	0.09	-0.17	
For. Presence in Industry	(18)	-0.02	-0.02	-0.01	0.00	0.20	0.09	0.01	-0.01	-0.02	0.04	-0.02	-0.01	0.12	0.13	0.30	0.66	-0.02

#### 4.3.2. EMPIRICAL RESULTS

Table 11 shows the estimations for employment growth and Table 12 for turnover growth. In each table, Models 1 and 2 correspond to the equations (1) and (2), respectively. In columns 3 and 4 we show the results of equation (1) applied separately to the samples of SMEs and LEs correspondingly, to further explore the ownership effect in interaction with size. Finally, column 5 shows the results of equation (3), testing the effects of size within the foreign firms' sample<sup>30</sup>.

##### a) Employment Growth

Table 11 shows the results for employment growth over 1988-2007. Regarding the effect of firm-level variables, all are statistically significant. Firm age and size have a significant inverted U-shaped effect upon employment growth, which means that young SMEs show positive trends on employment growth up to a certain threshold of age and size, maybe due to their nimbleness and need to reach a minimum efficient scale in order to compete with more mature and larger firms. Additionally, firms with higher operational

<sup>30</sup> Some additional models regarding the effect of firm size upon both dependent variables during crises were estimated. The results are presented in the Appendix C and D (pages 123 and 124).

performance and more human capital-intensive firms show slower employment growth rates.

When we control for firms' and industries' characteristics, foreign ownership, though with a negative coefficient, is not significant to explain differences in employment growth between firms. Regarding industries' attributes, firms in industries with lower concentration, higher export intensity and with greater foreign presence show higher employment growth over the period. Hence, firms' employment growth is an outcome of other firm and industry characteristics rather than a pure ownership effect (e.g., Karlsson et al., 2009).

The two recessions affecting the Portuguese economy impacted negatively on firms' employment growth (*Downturn* coefficient is negative and significant at 1% level), but not in a different fashion according to their ownership (Models 1, 3 and 4). This result is in line with McAleese and Counahan (1979) and Álvarez and Görg (2007). Accordingly, we do not find evidence of a (un)stabilizer role played by FF during recessions upon job losses.

Looking at the results of Model 2, the crises' impact upon employment growth seems stronger for larger firms. Large enterprises may be the first to lay-off workers in order to reduce operational costs to thrive the crisis. Sato (2000) and Tan and See (2004) also found evidence on SMEs' resistance during volatile macroeconomic conditions. Nevertheless, the effect of size is less visible among FF, as large FF's employment growth rates did not evolve significantly different from that of smaller FF during the two recessions (Model 5). Wang et al.'s (2005) study of firms' success during the Asian crisis also revealed that firm size was not significant to differentiate between foreign firms.

#### *b) Turnover Growth*

Table 12 reports the results for turnover growth. Regarding firm-level variables, as for employment growth, we find significant non-linear effects of firm's age and size. Larger firms tend to have better sales' performance although excessively large firms are affected by their inert and rigid nature. Turnover growth seems to lower during firms' infancy, growing faster only after firms attain a minimum age. Firms' operational

performance impacts positively upon firms' turnover growth and, as for employment dynamics, firms with higher human capital intensity tend to have slower rates of growth at sales.

In what regards turnover growth during all the period, foreign ownership *per se* matters. Foreign firms show 10-15% lower sales growth than their domestic partners.

The location in urban centres emerges as a positive factor for sales expansion, probably due to the proximity to a larger market. At industry-level, belonging to industries with higher MES, with greater concentration and lower foreign shares – thus, industries with higher entry barriers and greater potential for market gains – potentiate firms' turnover growth. Firms in more export-oriented industries tend to have slower turnover growth, probably due to higher competition in international markets.

Both recessions affected significantly the firms' turnover growth rate, but the effects seem to differ slightly between firms accordingly to their ownership and size. The effect of being foreign-owned during recessions is positive (the coefficient of *Own\*Downturn* is positive and significant in Models 1 and 3) as FF reveal about 5% higher sales growth rates during recessions compared with DF. Our result is in line with that found by Fukao (2001). Notwithstanding, the foreign ownership effect seems more significant among SMEs, but not so much for explaining differences between LEs during recessions.

As for employment growth, size is significant to differentiate firms during downturns. We found a U-shaped relationship between size and turnover growth under economic recessions. Until firms reach a certain threshold of size, their turnover growth may be strongly hit by economic slowdowns, becoming more resistant to sales' contraction as they grow big. However, as for employment growth, firm size is more significant within the group of DF and does not significantly differentiate firms within the sample of FF.

**Table 11.** Employment growth estimation results

	All Firms	All Firms	SMEs	LEs	FF
	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	0.5863 *** (0.0139)	0.5793 *** (0.0140)	0.6386 *** (0.0141)	-5.6111 *** (0.2006)	-0.8486 *** (0.1127)
Age	0.0002 ** (0.0001)	0.0002 ** (0.0001)	0.0002 ** (0.0001)	-4.19e-05 (0.0003)	0.0002 (0.0006)
Age squared	-7.36e-08 * (3.83e-08)	-9.45e-08 ** (3.84e-08)	-9.02e-08 ** (3.96e-08)	1.01e-08 (1.55e-07)	-7.70e-08 (2.86e-07)
Size	0.4594 *** (0.0020)	0.4615 *** (0.0021)	0.4715 *** (0.0021)	1.6917 *** (0.0509)	0.6537 *** (0.0211)
Size squared	-0.0358 *** (0.0004)	-0.0359 *** (0.0004)	-0.0405 *** (0.0005)	-0.1176 *** (0.0043)	-0.0431 *** (0.0028)
Firm Performance	-0.1334 *** (0.0007)	-0.1333 *** (0.0007)	-0.1376 *** (0.0007)	-0.0265 *** (0.0036)	-0.1005 *** (0.0043)
Human Capital	-0.1480 *** (0.0083)	-0.1469 *** (0.0083)	-0.1355 *** (0.0084)	-0.0910 (0.0615)	-0.0826 * (0.0496)
Ownership	-0.0034 (0.0066)	-0.0073 (0.0062)	-0.0016 (0.0073)	-0.0204 (0.0157)	
Urban	0.0050 (0.0076)	0.0049 (0.0076)	0.0034 (0.0079)	-0.1233 *** (0.0323)	-0.0224 (0.0343)
Large					-0.0123 (0.0224)
<b>Downturn</b>	<b>-0.0043</b> *** (0.0008)	<b>-0.0069</b> *** (0.0021)	<b>-0.0036</b> *** (0.0008)	<b>-0.0300</b> *** (0.0075)	<b>-0.0260</b> *** (0.0087)
<b>Own*Downturn</b>	<b>-0.0099</b> (0.0062)		<b>-0.0107</b> (0.0070)	<b>0.0036</b> (0.0145)	
<b>Size*Downturn</b>		<b>-0.0055</b> *** (0.0017)			
<b>Size squared*Downturn</b>		<b>0.0001</b> (0.0003)			
<b>Large dummy*Downturn</b>					<b>0.0067</b> (0.0177)
MES	-0.0002 (0.0005)	-0.0001 (0.0005)	-0.0006 (0.0006)	-0.0007 (0.0037)	0.0151 *** (0.0050)
HH Index	-1.4719 *** (0.2105)	-1.4975 *** (0.2105)	-1.5668 *** (0.2139)	3.0606 ** (1.3811)	-5.3278 *** (1.6135)
Industry Agglomeration	0.1761 *** (0.0320)	0.1743 *** (0.0320)	0.1858 *** (0.0322)	0.0444 (0.2755)	0.1196 (0.3173)
Export Intensity	0.0166 *** (0.0014)	0.0163 *** (0.0014)	0.0176 *** (0.0014)	-0.0203 (0.0124)	-0.0117 (0.0124)
Industry Growth	-0.0023 (0.0016)	-0.0023 (0.0016)	-0.0022 (0.0016)	-0.0022 (0.0188)	-0.0123 (0.0198)
Foreign Share	0.0532 ** (0.0228)	0.0525 ** (0.0228)	0.0530 ** (0.0230)	0.2376 (0.1746)	-0.0814 (0.19269)
Industry Dummies	YES	YES	YES	YES	YES
N	660457	660457	652229	8228	10045
R <sup>2</sup>	0.2758	0.2759	0.2776	0.2655	0.3116

\*\*\*, \*\*, \* means significant at 1%, 5% and 10% level, respectively.



**Table 12.** Turnover growth estimation results

	All Firms	All Firms	SMEs	LEs	FF
	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	-7.0903 *** (0.0296)	-7.0995 *** (0.0296)	-7.0076 *** (0.0296)	-13.3358 *** (0.6966)	-9.5496 *** (0.2940)
Age	-0.0086 *** (0.0002)	-0.0086 *** (0.0002)	-0.0090 *** (0.0002)	-0.0025 ** (0.0011)	-0.0042 *** (0.0015)
Age squared	4.25e-06 *** (7.93e-08)	4.25e-06 *** (7.94e-08)	4.45e-06 *** (8.10e-08)	1.19e-06 ** (5.43e-07)	2.07e-06 *** (7.32e-07)
Size	0.5016 *** (0.0041)	0.5082 *** (0.0043)	0.5340 *** (0.0044)	0.9649 *** (0.1770)	0.7208 *** (0.0553)
Size squared	-0.0426 *** (0.0009)	-0.0438 *** (0.0009)	-0.0542 *** (0.0010)	-0.0431 *** (0.0150)	-0.0442 *** (0.0072)
Firm Performance	0.5872 *** (0.0015)	0.5873 *** (0.0015)	0.5809 *** (0.0015)	0.8059 *** (0.0127)	0.6569 *** (0.0117)
Human Capital	-0.3057 *** (0.0175)	-0.3052 *** (0.0175)	-0.2710 *** (0.0175)	-1.0232 *** (0.2143)	-0.5190 *** (0.1313)
Ownership	-0.1508 *** (0.0137)	-0.1334 *** (0.0129)	-0.1488 *** (0.0151)	-0.1027 * (0.0553)	
Urban	0.0435 *** (0.0161)	0.0432 *** (0.0161)	0.0419 ** (0.0166)	-0.0265 (0.1135)	0.0165 (0.0906)
Large					-0.0602 (0.0575)
<b>Downturn</b>	<b>-0.0653 ***</b> (0.0017)	<b>-0.0476 ***</b> (0.0044)	<b>-0.0649 ***</b> (0.0016)	<b>-0.0158</b> (0.0262)	<b>-0.0168</b> (0.0224)
<b>Own*Downturn</b>	<b>0.0473 ***</b> (0.0128)		<b>0.0576 ***</b> (0.0144)	<b>-0.0480</b> (0.0506)	
<b>Size*Downturn</b>		<b>-0.0184 ***</b> (0.0036)			
<b>Size squared*Downturn</b>		<b>0.0036 ***</b> (0.0007)			
<b>Large dummy*Downturn</b>					<b>-0.0739</b> (0.0453)
MES	0.1260 *** (0.0011)	0.1260 *** (0.0011)	0.1244 *** (0.0011)	0.1357 *** (0.0129)	0.1596 *** (0.0130)
HH Index	7.4800 *** (0.4352)	7.4678 *** (0.4352)	7.2043 *** (0.4371)	15.2551 *** (4.8370)	-0.2351 (4.1338)
Industry Agglomeration	-0.3985 *** (0.0668)	-0.3996 *** (0.0668)	-0.3238 *** (0.0664)	-2.8138 *** (0.9587)	-1.4302 * (0.8191)
Export Intensity	-0.1449 *** (0.0030)	-0.1450 *** (0.0030)	-0.1404 *** (0.0029)	-0.2409 *** (0.0433)	-0.2132 *** (0.0320)
Industry Growth	0.0212 *** (0.0034)	0.0212 *** (0.0034)	0.0201 *** (0.0034)	0.0862 (0.0654)	-0.0454 (0.0506)
Foreign Share	-1.0332 *** (0.0475)	-1.0316 *** (0.0475)	-1.0341 *** (0.0472)	-0.8161 (0.6140)	-0.7287 (0.4987)
Industry Dummies	YES	YES	YES	YES	YES
N	618390	618390	610397	7993	9530
R <sup>2</sup>	0.2472	0.2472	0.2410	0.3737	0.2959

\*\*\*, \*\*, \* means significant at 1%, 5% and 10% level, respectively.

#### 4.4. CONCLUDING REMARKS

Our main empirical results on performance differences between FF and DF during recessions<sup>31</sup> are summarized in Table 13. Our outcomes are based on an empirical setting where foreign MNEs search mainly for a low-cost export base and, to a less extent, to expand their market. In brief, when we control for firms' and industries' characteristics, job losses in foreign MNEs during both recessions were not significantly different from that of indigenous firms, but at turnover levels foreign firms seem to have reacted better, maybe due to their organizational, managerial and technological advantages, adding to their multinationality advantages.

Beyond the foreign ownership effect, we show that firm size matters to explain domestic firms' growth, exerting significant negative effects on firms' employment growth and non-linear effects on turnover growth throughout recessions. Regarding employment growth, large firms are the ones registering greater job losses. SMEs' turnover appears to be more severely affected by downturns while very large firms may have knowledge advantages to exploit markets, registering better performance in terms of sales growth.

Summing up, for policy, our results do not contest the option for active FDI attraction policies. As regards the evaluation of the potential advantages arising from MNEs' presence during economic slowdowns, the results indicate that MNEs do not exert a disturbing effect on host economy employment during crisis and that may even contribute to smooth the declines in turnover.

**Table 13.** Summary of empirical results – employment and turnover growth

	Sample	Performance / Growth Measure	
		Employment Growth	Turnover Growth
<b>Foreign Ownership</b> effect during crises	All Firms	n.s.	+
	SMEs	n.s.	+
	LEs	n.s.	n.s.
<b>Firm Size</b> effect during crises	All Firms	-	∩
	FF	n.s.	n.s.

(-): significant negative effect; (+) significant positive effect; n.s.: no significant effect.

<sup>31</sup> As a robustness check, we repeated the previous empirical analysis for the sub-periods 1988-2000 and 1994-2006 (comprising the recessions of 1991-93 and 2001-03, respectively). We tried to replace the *Downturn* dummy by the corresponding 1-year lag and 2-year lag dummies, in order to test whether FF acted as potential stabilizers *after* the crises rather than *during* the crises. The results were not significantly different from those obtained for the global period 1988-2007, being available upon request. In addition, as the technological complexity of industries where FF operate could change the conclusions, we estimated Model 1 for the samples of firms operating in low-tech, medium-low tech and medium-high/high-tech. For employment growth, the results do not change significantly. For turnover growth, the potential stabilizers were FF operating in less technology-intensive industries. The results can be found in the Appendix A (page 121).

## **CHAPTER 5**

### **ECONOMIC SLOWDOWNS AND FIRM SURVIVAL: DO FOREIGN AND DOMESTIC FIRMS BEHAVE ANY DIFFERENT?**

#### **5.1. INITIAL CONSIDERATIONS**

This chapter analyses the determinants of firm exit and provides a comparison between the survival and hazard patterns of foreign and domestic firms over almost two decades, specially attending on economic slowdowns suffered by Portuguese economy. By examining the link between foreign multinational enterprises and firm failure in Portuguese Manufacturing Industry through time-to-event models, we address three main questions: first, do foreign MNEs' affiliates have higher failure rates than domestic firms? Second, does the foreignness effect change during economic downturns? And finally, is the survival of foreign firms affected by their size? Complementarily, we also assess whether the presence of multinationals in the industry affect the survival of other firms, as a way to search for potential horizontal spillovers arising from foreign presence in PMI.

We analyze foreign and domestic firms created in the period 1988-2005, by following their paths during stable and unstable periods. Next section provides a detailed description of our methodological procedures and finally the univariate and multivariate analyses are presented, where empirical results are discussed.

#### **5.2. METHODOLOGICAL ISSUES**

##### *5.2.1. COMPUTATION OF DURATION DATA*

Owing to the longitudinal dimension of QP database, an ideal characteristic to perform survival analyses, we were able to follow individual firms over time. Working

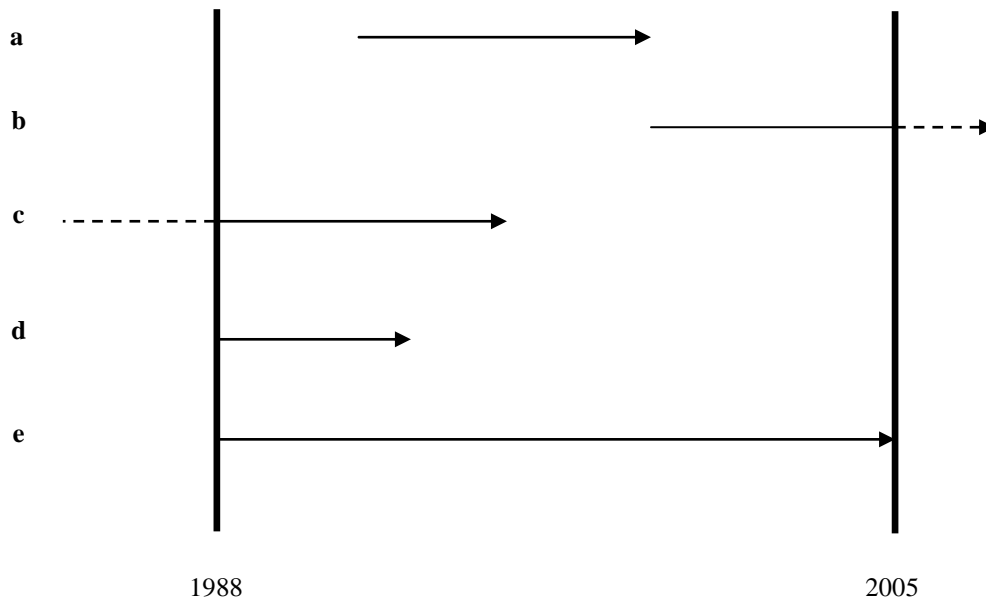
directly with raw files (from 1985 to 2007), it was possible to compute entry and exit measures by ourselves. This analysis started in 1986, since data on 1985 was needed to check the presence of firms in the database in the previous year. The time of exit was determined by identifying the year when firms cease to report to the survey. As with such a large database some coding errors in the original files are inevitable, the checking of exits stopped in 2005, in order to require that a firm be absent from the file at least two years to be considered as a closure. Consequently, temporary exits (1 year of absence) were not considered as closures, to be on the safe side in identifying the time of exit in the database. Accordingly, firms that were in the files in years  $t-1$  and  $t+1$ , but not in  $t$ , were considered to be active in  $t$ . The respective missing record was amended for that year, with key variables being imputed as the average values registered in the adjacent years. Similar procedures were applied in the studies of Mata and Portugal (1999, 2002, 2004) and Geroski et al. (2010), also using QP database.

Despite we have data for the period 1985-2007, the survival analysis will be conducted for the period 1988-2005. We could start in 1986, but we only have data on industry's exports since 1988, as previously explained in the preceding chapters. The years 2006 and 2007 were only used as a control for the identification of exits. Accordingly, we focus on the 1988 cohort and on firms born thereafter<sup>32</sup>, following them until their last record in the database, which may correspond to the moment of exit or, alternatively, to the last year we have information about the firm. In this last case, if the firm has not experienced the failure event during the whole period, it is identified as a censored object – which is known in the literature by *right-censoring*, occurring for those firms whose birth date is known but who are still living when they are lost to follow-up or when the study ends (Singer and Willett, 1993; Hosmer et al., 2008). Figure 45 helps to understand these problems associated with time-to-event data, highlighting the cases which were and were not included in our analysis.

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<sup>32</sup> This is known by *left truncation* in survival analysis literature and is common in the empirical studies on firm survival. In our case, this arises because we have no annual data for firms born before 1988 (e.g., for a firm created in 1950, we have no complete data for the period 1950-1987, so it must be excluded from our analysis).

**Figure 45.** Examples of complete and incomplete observations in a restricted time window



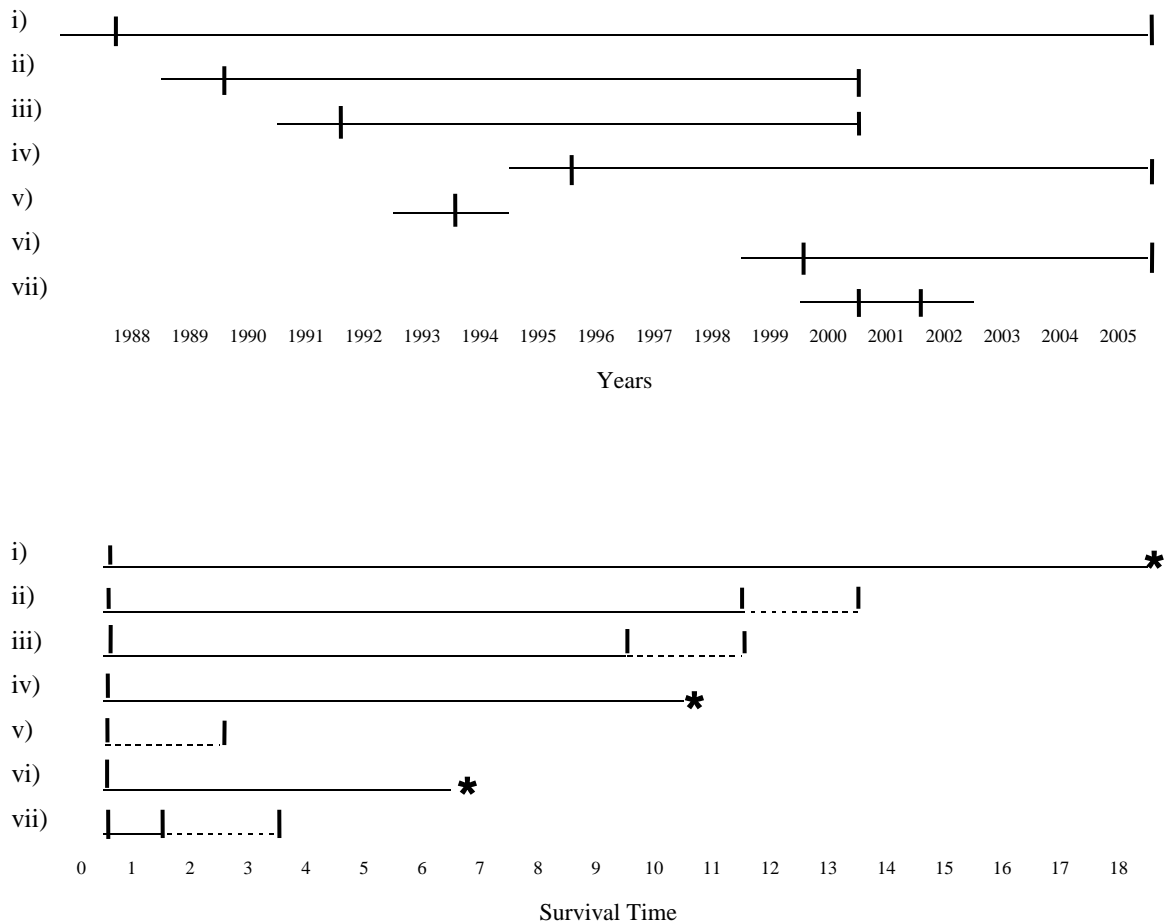
The duration of Firm **a** in Figure 45 is completely observed, thus cases similar to that were included in the analysis. Firm **b** is an example of a right-censored case, that is, we know its birth date, but we do not know its death date, because it has not experienced the “failure event” during the time window observed. So, it is included in the database as a censored element. Firm **c** is left-truncated, because it became at risk of failure before the start of observation window. As a result, given that we have no data for the period represented by the dashed line, we have to exclude cases like this from our analysis. The durations of Firm **d** and Firm **e** are both completely observed and both belongs to the 1988 cohort. However, while Firm **d** experiences the failure event some years later, Firm **e** reaches the maximum duration allowed by our time window – 18 years, failing in 2005. In short, only cases similar to Firm **c** were excluded from the analysis, representing the left-truncation problem that leads us observing only the firms born since 1988. Similar approaches were adopted in the studies of Mata and Portugal (1999, 2002, 2004).

Figure 46 presents the sampling plan from the database, summarizing the proceedings adopted in the discrete time database. The first panel displays the longevity of firms, represented on a calendar time, while the second panel presents the corresponding measured durations. For expositional convenience, only an arbitrary spell is depicted for some of the cohorts of firms. The horizontal lines depicted in the first panel represent the

longevity of firms since the moment of entry until the moment of failure/exit, while the vertical lines indicate the first and last surveys in which the firm is observed.

Thus, we can track the presence of a firm on a yearly basis, as illustrated in the second panel. The solid lines represent the effective duration intervals, determined with the aid of the dotted lines, which represent the application of the criterion to identify the closures (i.e., the firm must be absent from the file for at least two years to be considered as a closure).

**Figure 46.** The sampling plan



Cases ii), iii), v) and vii) are examples of firms that exited during the period, although presenting different survival times. Firms i), iv) and vi) were still alive in the end of the period, so the star in the end of their observations' duration means that they were treated as censored in the analysis. Finally, the figure makes clear that whereas the firms

from the 1988 cohort can reach a maximum of 18 years of duration, the ones from the 2003 cohort can reach, at most, 2 years. As a result, while the exit rates for the first and second years are estimated using data from the 18 cohorts, the subsequent rates are estimated using fewer cohorts. Our statistical model will pay particular attention to this fact.

### 5.2.2. STATISTICAL MODEL

To analyze in detail the time pattern of firms' exit, we rely on econometric models belonging to a class of models known as duration models or time-to-event analysis. Conventional multivariate statistical approaches such as linear regression models are ill-suited to properly analyze data when the problematic under study is the time elapsed within a state (in our case, firm's life) before a transition occurs to a different state (exit). We saw that, at the end of the period under scrutiny, a number of firms are still operating, so that their duration is still incomplete. Due to this censoring, in our survival analysis of new firms, we need to employ a statistical model able to accommodate such incomplete durations. Furthermore, since we are interested in depicting the evolution of the exit rates as time proceeds, the use of standard binary choice models is also inadequate.

The key concept in duration analysis is the *hazard rate*, that is, the probability that an observation exits within a particular time interval, given that it survived until then. In our case, the data on firms' duration comes from an annual survey, so our measured durations are grouped into time intervals of one year length. For those firms that were still operating at the end of the period, the relevant information is that their survival time exceeded the lower limit of the last observed duration. Such a sampling plan, with which we can only assign to firms discrete durations, is properly accommodated in the framework of discrete time duration models (Singer and Willett, 1993). We thus proceed by dividing the time axis into 18 intervals, corresponding to our 18 measured durations in Figure 46, and defining the hazard rate  $h(t)$  for the  $t^{\text{th}}$  interval as the probability of exiting during the  $t^{\text{th}}$  interval, conditional upon having survived until then.

Following the methodology applied in other studies conducted for Portugal with QP database (Mata and Portugal, 1999, 2002), we employ a very flexible specification for the hazard function, in which the exit rates are assumed to be constant within each interval

but different between intervals, by defining a set of dummy variables for each and every duration interval. This can be interpreted as a piece-wise linear approximation to a possibly complex parametric hazard function, which is equivalent, according to the jargon of the time-to-event literature, of saying that we apply a piece-wise constant hazard model. The hazard function in interval  $t$  is defined as:

$$h(t) = e^{\lambda t}, \quad t = 1, \dots, T \quad (4)$$

where the sequence of  $e^{\lambda t}$  gives the early evolution of the exit rates. Thus,  $e^{\lambda 1}$  gives the probability of exit within the first year of firm's life,  $e^{\lambda 2}$  denotes the probability of closure during the second year, given that the firm did not exit during the first year, and so on. In order to account for the effects of covariates, we extend the previous hazard function:

$$h(t | \mathbf{X}_{t-1}) = e^{\lambda t} e^{(\beta \mathbf{X}_{t-1})}, \quad t = 1, \dots, T \quad (5)$$

where  $\beta$  denotes the vector of regression coefficients measuring the impact of a set of explanatory variables included in vector  $\mathbf{X}$ <sup>33</sup>, often pointed out as the main determinants of firm survival and/or exit by the literature on these matters. The effect of such covariates upon the hazard rate is assumed to be proportional, as suggested by Cox (1972), which can easily be seen in the following reparameterization:

$$\log h(t | \mathbf{X}_{t-1}) = \lambda_t + \beta \mathbf{X}_{t-1}, \quad t = 1, \dots, T \quad (6)$$

Concerning the firm-level and industry-level variables included in vector  $\mathbf{X}$ , we will not develop specific hypotheses regarding their effects, but we will control for them since they are likely to affect firm survival and firm exit according to the literature. In particular, firm size and firm age are two of the most debated factors in the empirical survival studies. Firm size is frequently found to exert a positive influence on firm survival, given that large firms have higher probabilities of being operating at a minimum

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<sup>33</sup> For a detailed description of variables included in vector  $\mathbf{X}$ , remember the Table 9 in Chapter 4. The variables included in the survival analysis were the same independent variables considered in the empirical study of the previous chapter. Additionally, we included an industry-level variable usually considered in firm survival studies – Entry Rate, computed as the ratio “Entrants' employment in year  $t$  / 2-digit industry total employment in year  $t$ ”.



efficient scale and may also have better access to capital or labour markets (Mahmood, 1992; Agarwal, 1997; Pérez et al., 2010). However, since the effect of firm size upon firm survival may be non-linear (e.g., Disney et al., 2003), we will control for a potential quadratic relation between firm size and hazard rates. Similarly, firm age has been acknowledged as a crucial factor for firm survival prospects (Geroski, 1995), despite no clear relationship is still established in the literature. With age, firms go through a process of learning about efficiency and market competitiveness, thus reducing the well known *liability of newness*, so that the risk of exit is expected to decrease with the accumulated experience of firms (Jovanovic, 1982; Ericsson and Pakes, 1995). However, several studies have found an inverted-U shaped link between age and exit rates, known as the *liability of adolescence hypothesis* (Fichman and Levinthal, 1991; Wagner, 1994; Strotmann, 2007; Pérez et al., 2010). Accordingly, we will also control for a non-linear effect of firm age.

Firm performance will be also taken into consideration, as several studies have been showing that poor performance is strongly associated with higher failure rates (Altman, 1968; Köke, 2002; Heiss and Köke, 2004). Moreover, different performance measures have been used to show such relationship, as profit margins or labour productivity (Lin and Huang, 2008; Pérez et al., 2010). In our case, we focus on labour productivity as a measure of operational performance. Regarding human capital, despite its role as a specific-asset potentially acting as an ownership advantage, empirical evidence on its effect upon firm exit and/or survival is scarce and ambiguous (Teixeira and Vieira, 2005). Bates (1990) and more recently Acs and Armington (2009) are valuable exceptions, though obtaining no definite conclusions. In our case, we will assess the impact of better skilled workers upon firm exit.

Geographical location of firms may matter as well for firm survival prospects. Rural locations may lack diversity but can enable the firm to exploit a niche with limited competition. Conversely, urban locations often offer a wealth of diverse resources but also greater competition and higher costs related to diseconomies of agglomeration (Stearns et al., 1995; Fotopoulos and Louri, 2000; Littunen, 2000).

Concerning the industry environment, we will use control variables to account for potential differences in the industry context. We will consider the minimum efficient scale as Audretsch (1995) argues that one of the reasons why so many firms fail is that their entry size is smaller than the minimum scale required to be efficient. We will control for

market concentration, which may either raise the risk of failure through greater competition intensity or decrease the exit rates by offering the incumbents the enough power to retaliate against entrants. Industry growth will also be controlled for, as average profits are affected by growth rates of industries, so industries growing quickly may exert positive impacts upon survival. Entry rates may also be associated with firm survival, as firms tend to enter the industries where higher profits are expected. Industry agglomeration, export intensity and foreign presence in the industry will be taken into account as well, although no definite expectation about their impacts exists according to the available literature but they are commonly controlled for in comparative studies of domestic and foreign firms. Regarding foreign presence, the effect is positive if there are positive spillovers from foreign firms to other firms in the industry or negative if an adverse competition effect exists.

Finally, the overall state of the economy has long been indicated as an important force driving firms out of business (Geroski et al., 2010). Current macroeconomic conditions may change expectations about the future, leading firms to exit if an unfavourable environment is predictable. Despite some studies prove that exit is not responsive to the cycle (e.g. Boeri and Bellman, 1995; Ilmakunnas and Topi, 1999), many others found that firm exit is countercyclical and that there is a detrimental impact of macroeconomic instability upon firms' survival and their dynamics (Audretsch and Acs, 1994; Box, 2008; Bhattacharjee et al., 2009). Accordingly, we will control for macroeconomic environment, specially attending on downturn periods which are expected to impact positively on firms' hazards, though eventually differently among foreign and domestic firms. If that is the case, we will test in what extent foreign firms have reacted better to crises and thus acted as a stabilizer element in Portuguese manufacturing. Regarding the pure ownership effect, no consensus is found in the literature about the direction of its effect upon firm survival/exit (remember Table 2). Despite this, we will also assess the effect of foreign ownership, on order to conclude if there remain any significant differences at exit rates than can be attributed to the *foreignness* in itself.

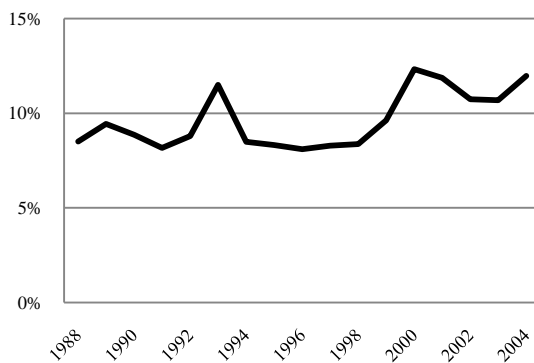
All our models were estimated by maximum likelihood methods and the estimations were performed with STATA 10, an econometric package well-suited to perform survival analyses. Next we present and discuss our empirical results.

### 5.3. EMPIRICAL ANALYSIS

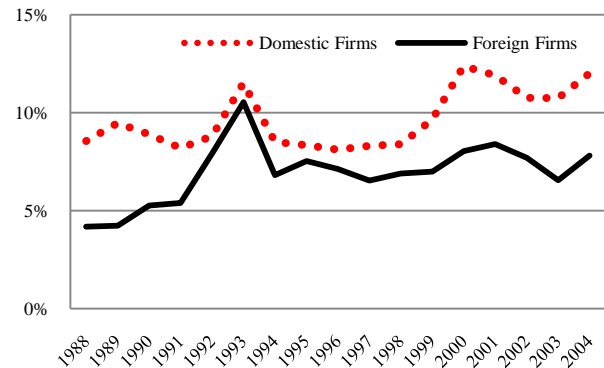
#### 5.3.1. UNIVARIATE ANALYSIS AND DESCRIPTIVE STATISTICS

Figure 47 depicts the ratio of firms' exits to total operating firms in each year. An increasing trend over the period is observable and on average 10% of total firms exited every year. During the economic slowdowns, mainly during the early 1990s downturn, such rates seemed to be greater than during the remaining period, which suggests that economic recessions impacted positively on firms' mortality. In other words, firm exit seems to be countercyclical, being greater during contractions and lower during expansions. By disaggregating the firms' mortality rates according to their ownership (Figure 48), we see that the proportion of annual failures was always greater among domestic firms. On average, 10% of domestic firms exited every year, whereas only 7% of foreign firms closed. However, both groups of firms seem to have been negatively affected by recessive periods, exhibiting higher mortality rates over downturns.

**Figure 47.** Annual mortality rates of manufacturing firms



**Figure 48.** Annual mortality rates of manufacturing firms by ownership



After applying the procedures previously explained in section 5.2.1, we obtained an unbalanced panel so that, for each firm, there are as many data rows as there are time intervals at risk of the “event” (failure) occurring. This constitutes a discrete time database, also known by a *person-period data set* in the survival analysis literature (Singer and Willett, 1993). The final data set comprises 87.027 firms, belonging to 18 cohorts (from 1988 to 2005). From this group of firms, 55.622 failures were identified. The median

survival time is 5 years, a result commonly obtained in the literature on firm survival and also in studies conducted for Portugal (e.g., Mata and Portugal, 2004).

As a first step of our survival analysis, a brief univariate analysis was performed by using the life-table approach and Kaplan-Meier methods (Kalbfleish and Prentice, 1980). The Kaplan-Meier estimator of surviving beyond time  $t$  is the product of survival probabilities in  $t$  and the preceding periods, as expressed below:

$$S(t) = \prod_{j=t_0}^t \frac{n_j - d_j}{n_j} \quad (4)$$

with  $n_j$  representing the number of observations that have not failed and are not censored at the beginning of each time period and  $d_j$  representing the number of failures that occur during each time period  $t$  (Hamilton, 2006). Precise estimations for the survivor function can be found in Table 14. Hazard rates and cumulative failure rates (corresponding to  $1 - S(t)$ ) are reported as well.

**Table 14.** Survival Rates and Hazard Rates<sup>34</sup>

<b>Time Interval</b>	<b>Nr. firms at risk</b>	<b>Nr. failures</b>	<b>Net Lost*</b>	<b>Survival</b>	<b>Std. Error</b>	<b>Hazard</b>	<b>Std. Error</b>	<b>Cumulative Failure</b>
[1-2[	87027	16890	3350	<b>0.8059</b>	0.0013	<b>0.1941</b>	0.0015	<b>0.1941</b>
[2-3[	66787	9631	2820	<b>0.6897</b>	0.0016	<b>0.1442</b>	0.0015	<b>0.3103</b>
[3-4[	54336	7058	3145	<b>0.6001</b>	0.0017	<b>0.1299</b>	0.0015	<b>0.3999</b>
[4-5[	44133	5328	3381	<b>0.5277</b>	0.0018	<b>0.1207</b>	0.0017	<b>0.4723</b>
[5-6[	35424	3953	3466	<b>0.4688</b>	0.0018	<b>0.1116</b>	0.0018	<b>0.5312</b>
[6-7[	28005	2872	1975	<b>0.4207</b>	0.0018	<b>0.1026</b>	0.0019	<b>0.5793</b>
[7-8[	23158	2277	1544	<b>0.3793</b>	0.0018	<b>0.0983</b>	0.0021	<b>0.6207</b>
[8-9[	19337	1704	1335	<b>0.3459</b>	0.0018	<b>0.0881</b>	0.0021	<b>0.6541</b>
[9-10[	16298	1387	1290	<b>0.3165</b>	0.0019	<b>0.0851</b>	0.0023	<b>0.6835</b>
[10-11[	13621	1125	1060	<b>0.2903</b>	0.0019	<b>0.0826</b>	0.0025	<b>0.7097</b>
[11-12[	11436	929	1273	<b>0.2668</b>	0.0019	<b>0.0812</b>	0.0027	<b>0.7332</b>
[12-13[	9234	787	1491	<b>0.2440</b>	0.0019	<b>0.0852</b>	0.0030	<b>0.7560</b>
[13-14[	6956	547	896	<b>0.2248</b>	0.0019	<b>0.0786</b>	0.0034	<b>0.7752</b>
[14-15[	5513	447	854	<b>0.2066</b>	0.0019	<b>0.0811</b>	0.0038	<b>0.7934</b>
[15-16[	4212	303	950	<b>0.1917</b>	0.0020	<b>0.0719</b>	0.0041	<b>0.8083</b>
[16-17[	2959	181	855	<b>0.1800</b>	0.0020	<b>0.0612</b>	0.0045	<b>0.8200</b>
[17-18[	1923	150	914	<b>0.1660</b>	0.0022	<b>0.0780</b>	0.0064	<b>0.8340</b>
[18-19[	859	53	806	<b>0.1557</b>	0.0025	<b>0.0617</b>	0.0085	<b>0.8443</b>

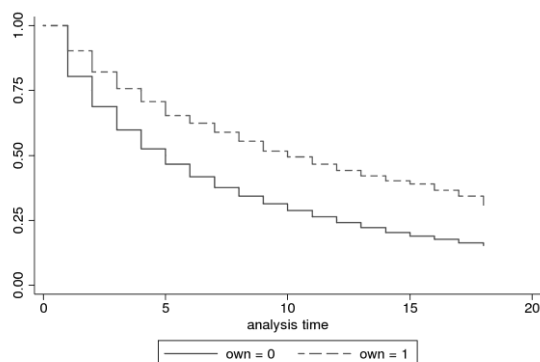
\* "Net Lost" gives the number of censored cases and hence no longer entering the risk set.

<sup>34</sup> The survival rates and hazard rates of SMEs and LEs can be found in the Appendix H (page 127).

In summary, the statistics confirm that the survivor function has a negative slope and that only 15,57% of the firms remained alive after 18 years. About hazard rates, we conclude that the risk of failure tends to be higher during the first 5 years of firms' life, being slightly lower thereafter. More precisely, more than 50% of firms cease their operations during the first 5 years and almost 70% of firms die before completing a decade of life. Next we compare the estimated survivor functions for different categories of firms, stratified according to a foreign ownership dummy (Own = 1 if the firm is foreign-owned, 0 otherwise) and a firm size dummy (Small = 1 if the firm is a Small-Medium Firm, 0 otherwise). Firms are over again classified as small and medium-sized or large-sized according to the European definition of SMEs. Figures below depict the Kaplan-Meier survivor functions allowing to compare the different groups.

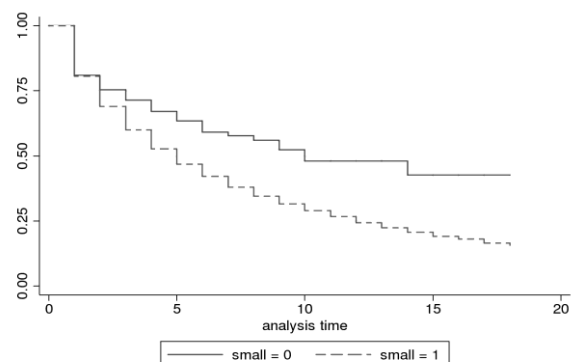
These first results suggest that, unconditionally, foreign-owned firms survive longer than their domestic counterparts. DF display a median survival time about 4-5 years, while the corresponding level for their foreign counterparts ascends to about 10 years. In addition, the results show that only 16% of DF were alive in the 17<sup>th</sup> year of life, whereas more than 34% of FF remained active at the same survival time. The comparisons between smaller and larger firms show that the median survival time of SMEs is about 5 years (similarly to domestic firms), whereas large-sized companies present median life spans of 10 years (like foreign-owned firms). The Log-Rank and Wilcoxon test confirms that differences are statistically significant at 1% level.

**Figure 49.** Kaplan-Meier estimates of survivor functions by foreign ownership



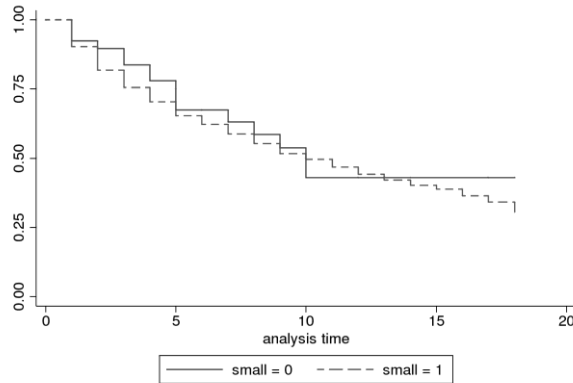
Log-Rank Test  $\chi^2_{(1)} = 192.82^{***}$  Wilcoxon Test  $\chi^2_{(1)} = 169.47^{***}$

**Figure 50.** Kaplan-Meier estimates of survivor functions by firm size



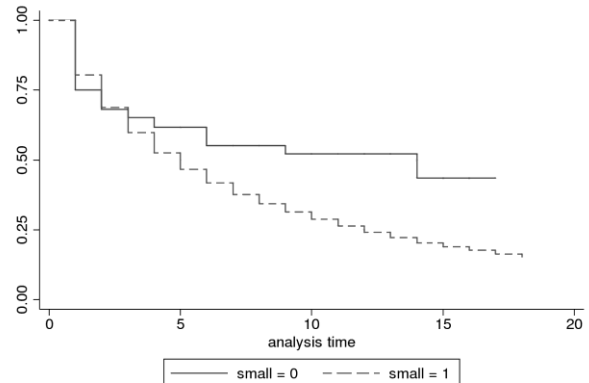
Log-Rank Test  $\chi^2_{(1)} = 14.73^{***}$  Wilcoxon Test  $\chi^2_{(1)} = 6.92^{***}$

**Figure 51.** Kaplan-Meier estimates of survivor functions of foreign firms by firm size



Log-Rank Test  $\chi^2_{(1)}=0.25$       Wilcoxon Test  $\chi^2_{(1)}=0.49$

**Figure 52.** Kaplan-Meier estimates of survivor functions of domestic firms by firm size



Log-Rank Test  $\chi^2_{(1)}=7.08^{***}$       Wilcoxon Test  $\chi^2_{(1)}=1.18$

Figures 51 and 52 compare the unconditional survival rates between small and large firms within the samples of FF and DF. Within FF, the differences in survival chances seem not to be relevant, with the curves almost overlapping and median survival time being almost the same for both sets (about 10 years). Conversely, large DF seem to have substantially better chances of survival (even higher than survival patterns of large FF), exhibiting a median survival time of 13 years. In opposition, small DF are very sensible during their infancy, with almost 40% of these firms failing before the third year of life and less than 50% reaching the fifth year. The Log-Rank and Wilcoxon tests confirm that firm size does not seem to be relevant for the survival within the foreign affiliates group and the results are ambiguous for the domestic group.

### 5.3.2. EMPIRICAL RESULTS

Our empirical strategy went through two main steps. First we have controlled for heterogeneity among firms by including in our estimations those firm-level and industry-level variables previously described and that are expected to affect firm survival/exit according to the literature. Among those, the dummy variable *Own* allowed distinguishing between FF and DF. As our main goal is to assess whether FF have higher failure rates than DF and moreover what happens during economic downturns, our estimations allow

evaluating the marginal impact of being foreign during recessions through the interaction term *Own\*Downturn*.

Second and complementarily, we test whether firm size interferes with the foreign ownership effect by replacing the *Own* dummy by two dummies, corresponding to foreign SMEs and foreign large-enterprises. By attending solely on FF's sample, we also test whether being large-sized matters for FF's survival during economic downturns. In addition, we test if any non-linear effect of firm size upon firms' hazard rates during crises exists<sup>35</sup>. Table 15 reports our results.

Our first regression shows the unconditional impact of being foreign-owned upon the risk of failure. The estimate of -0.2912 indicates that FF have a hazard rate about 25% (the discrete rate of change in the probability of exit is the  $\exp(\beta)-1$ ) lower than domestic ones, which confirms the pattern previously observed in Figure 49. For the period 1983-1989, Mata and Portugal (2002) had found as well that, unconditionally, FF were 51% less prone to exit than DF.

We then included the other variables previously discussed. Regarding firm-level variables, all are statistically significant. Firm age exerts an inverted U-shaped effect upon exit rates, confirming that during the first years of life, the risk of failure increases, decreasing over the time after a certain threshold above which firms achieve some maturity. Alternatively, firm size impact is U-shaped, which means that the larger the firms, the higher the survival chances, though very large firms may see their failure risk increase possibly due to the inertia related to their huge dimension. Firm performance is positively linked to firm survival, which means that best performers tend to survive longer.

Contrary to our expectations, human capital increases the firms' exit risk. Though surprising, such an outcome is reasonable and similar conclusions were already obtained by other studies for Portugal using QP database (Teixeira and Vieira, 2004a, 2004b, 2005). Teixeira and Vieira (2004a, 2004b), based on textile manufacturing over 1984-1992, argue that hiring top educated workers may increase firm failure risk, at least in the medium-long run, since these workers tend to apprehend firm total industry specific knowledge quicker than their less educated counterparts, and therefore require higher wage levels, otherwise exit to rival firms, which turn the firm unprofitable. Teixeira and Vieira (2005) extended that analysis based on data relative to 28 NUTs and 275 Portuguese municipalities between

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<sup>35</sup> Some additional models regarding the effect of firm size per se upon firms' hazard rates during crises were estimated. The results are presented in the Appendix E (page 125).

1990-1999 and confirmed that human capital intensive regions were those that, on average, had higher firms' failure rates, which contradicts the general expectation that human capital corresponds to an ownership advantage that leads to higher survival chances. For USA, Acs and Armington (2009) also found puzzling results on the link between human capital and firm survival and did not discard the hypothesis that higher shares of college degrees lead to higher rates of formation of new firms that fail, especially during recessions. For Spain, Pérez et al. (2010) find that the proportion of skilled labor plays no role both on firm risks' of failure or of being acquired. In our case, higher shares of top skilled labour were always found to increase the failure risk, and for FF the negative effect is found to be even higher (Model 9).

The effect of being foreign-owned changes dramatically after controlling for firms' specificities. The result remains valid in the remaining estimations, after controlling for macroeconomic conditions, region and industry. According to our results, even when accounting for firm and industry specificities, foreignness does matter in what concerns probability of exit. FF are now found to have about 13% higher hazards than DF, a result which is in line with a significant part of the literature presented in Table 2.

The results from the estimation of model 5 show that downturn periods seem to have impacted negatively upon firms' hazards, but not in a different fashion according to their ownership. With respect to the effect of industry variables, higher entry rates and higher export intensity increase the risk of failure. Higher MES instead reduce the risk of exit. The sign of *foreign presence* coefficient is negative and significant indicating that there are positive spillover effects from operating in an industry with strong presence of foreign MNEs.

In what concerns the influence of location, being at urban centers is found to increase the risk of failure. In fact, despite the wealth of diverse resources often found in urban areas, the intensity of competition or diseconomies or agglomeration lowers firm survival.



**Table 15.** Hazard Rates Estimation Results<sup>36</sup>

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
Constant	-1.6786 *** (0.0151)	-1.2525 *** (0.0517)	-1.3000 *** (0.0519)	-1.3000 *** (0.0519)	-1.1332 *** (0.0747)
Age		0.0117 *** (0.0004)	0.0119 *** (0.0004)	0.0119 *** (0.0004)	0.0117 *** (0.0004)
Age squared		-5.82e-06 *** (2.04e-07)	-5.91e-06 *** (2.02e-07)	-5.91e-06 *** (2.02e-07)	-5.83e-06 *** (2.07e-07)
Size		-0.5523 *** (0.0113)	-0.5524 *** (0.0113)	-0.5524 *** (0.0113)	-0.5479 *** (0.0113)
Size squared		0.0485 *** (0.0029)	0.0483 *** (0.0029)	0.0483 *** (0.0029)	0.0486 *** (0.0029)
Firm Performance		-0.0074 (0.0048)	-0.0079 *** (0.0048)	-0.0079 * (0.0048)	-0.0180 *** (0.0049)
Human Capital		0.2851 *** (0.0452)	0.2696 *** (0.0452)	0.2696 *** (0.0452)	0.2546 *** (0.0455)
<b>Ownership</b>	<b>-0.2912 ***</b> (0.0471)	<b>0.1164 **</b> (0.0543)	<b>0.1216 **</b> (0.0543)	<b>0.1288 *</b> (0.0675)	<b>0.1276 *</b> (0.0675)
Urban		0.1540 *** (0.0100)	0.1531 *** (0.0100)	0.1531 *** (0.0100)	0.1572 *** (0.0100)
Downturn			0.1477 *** (0.0099)	0.1479 *** (0.0100)	0.1317 *** (0.0103)
<b>Own*Downturn</b>				<b>-0.0192</b> (0.1082)	<b>0.0021</b> (0.1083)
MES					-0.0375 *** (0.0066)
HH Index					4.8113 (3.5584)
Industry Agglomeration					-0.5695 (0.4100)
Exports/VAB					0.0869 *** (0.0213)
Industry Growth					0.0032 (0.0205)
For. Presence in Industry					-0.5900 * (0.3305)
Entry Rate					4.0428 *** (0.3727)
Industry dummies	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes
N	417786	363462	363462	363462	362462
$\chi^2$	6391.99	12402.20	12619.98	12620.01	12870.46
Log Likelihood	-160702.84	-128571.29	-128462.40	-128462.38	-128337.03

\*, \*\*, \*\*\* means significant at 10%, 5% and 1% respectively.

<sup>36</sup> Additionally, we estimated model 5 separately for manufacturing industries according to different levels of technological complexity. Only for Medium-High/High Technology industries FF were found to survive longer during crises, presenting 16% lower exits than DF. The results are presented in the Appendix B (page 122). As a robustness check, we also ran the same global regression but replacing the Downturn dummy by a similar dummy variable with 1-year and 2-year lags, separately. No difference was found between FF's and DF's hazard rates during and immediately after the economic slowdowns. The results are available upon request.

**Table 15.** Hazard Rates Estimation Results (continued)

	Model 6		Model 7		Model 8		Model 9 <sup>37</sup>		Model 10	
Constant	-1.1293 ***	(0.0748)	-1.1384 ***	(0.0747)	-1.1272 ***	(0.0750)	-0.1344	(0.7721)	-1.1152	(0.0750)
Age	0.0117 ***	(0.0004)	0.0117 ***	(0.0004)	0.0118 ***	(0.0004)	0.0373 ***	(0.0136)	0.0117 ***	(0.0004)
Age squared	-5.83e-06 ***	(2.06e-07)	-5.83e-06 ***	(2.06e-07)	-5.84e-06 ***	(2.06e-07)	-0.0004 *	(0.0002)	-5.82e-06 ***	(2.08e-07)
Size	-0.5494 ***	(0.0113)	-0.5545 ***	(0.0115)	-0.5534 ***	(0.0115)	-0.4836 ***	(0.1203)	-0.5572 ***	(0.0143)
Size squared	0.0490 ***	(0.0029)	0.0512 ***	(0.0030)	0.0504 ***	(0.0030)	0.0222	(0.0211)	0.0469 ***	(0.0038)
Firm Performance	-0.0183 ***	(0.0049)	-0.0173 ***	(0.0049)	-0.0184 ***	(0.0049)	-0.0384	(0.0383)	-0.0181 ***	(0.0049)
Human Capital	0.2524 ***	(0.0455)	0.2633 ***	(0.0452)	0.2534 ***	(0.0455)	0.5516 **	(0.2496)	0.2548 ***	(0.0456)
<b>Ownership</b>									<b>0.1300 **</b>	(0.0544)
<b>FF_small</b>	<b>0.1640 **</b>	(0.0688)			<b>0.1592 **</b>	(0.0688)				
<b>FF_large</b>			<b>-0.4072</b>	(0.2835)	<b>-0.3813</b>	(0.2837)				
Urban	0.1571 ***	(0.0100)	0.1576 ***	(0.0100)	0.1571 ***	(0.0100)	0.4714 ***	(0.1166)	0.1572 ***	(0.0100)
Large							0.0884	(0.3726)		
Downturn	0.1317 ***	(0.0103)	0.1316 ***	(0.0103)	0.1317 ***	(0.0103)	0.0558	(0.1172)	0.0866 ***	(0.0189)
<b>FF_small*Downturn</b>	<b>0.0061</b>	(0.1115)			<b>0.0063</b>	(0.1115)				
<b>FF_large*Downturn</b>			<b>-0.0170</b>	(0.4495)	<b>-0.0165</b>	(0.4495)				
<b>Size*Downturn</b>									<b>0.0271</b>	(0.0223)
<b>Size squared*Downturn</b>									<b>0.0033</b>	(0.0058)
<b>Large dummy*Downturn</b>							<b>-0.0396</b>	(0.4667)		
MES	-0.0375 ***	(0.0066)	-0.0373 ***	(0.0066)	-0.0375 ***	(0.0066)	-0.1016	(0.0789)	-0.03806 ***	(0.0066)
HH Index	4.8222	(3.5585)	4.7307	(3.5589)	4.8038	(3.5589)	1.4860	(33.4999)	4.9128	(3.5578)
Industry Agglomeration	-0.5696	(0.4100)	-0.5761	(0.4100)	-0.5722	(0.4100)	-5.1041	(4.8781)	-0.5385	(0.4102)
Exports/VAB	0.0869 ***	(0.0213)	0.0869 ***	(0.0213)	0.0870 ***	(0.0213)	-0.1216	(0.2210)	0.0878 ***	(0.0213)
Industry Growth	0.0032	(0.0205)	0.0033	(0.0205)	0.0032	(0.0205)	0.2233	(0.2595)	0.0031	(0.0205)
For. Presence in Industry	-0.5902 *	(0.3305)	-0.5810 *	(0.3306)	-0.5870 *	(0.3305)	-3.8211	(2.9904)	-0.6049 *	(0.3305)
Entry Rate	4.0437 ***	(0.3727)	4.0434 ***	(0.3727)	4.0448 ***	(0.3727)	7.6194 **	(3.7721)	4.0539 ***	(0.3726)
Industry dummies	Yes		Yes		Yes		Yes		Yes	
Time dummies	Yes		Yes		Yes		Yes		Yes	
N	362462		362462		362462		4469		362462	
$\chi^2$	12873.75		12868.87		12877.05		241.39		12888.61	
Log Likelihood	-128335.38		-128337.82		-128333.74		-1155.37		-128327.96	

\*, \*\*, \*\*\* means significant at 10%, 5% and 1% respectively.

<sup>37</sup> Model 9 was estimated only for the sample of foreign-owned firms.

As explained earlier we are also concerned with the possibility that firm size affected exit and moderated the foreignness effect (Models 6 to 10). The results show that the probability of exit is higher among smaller FF. Not only the dummy variable FF\_small is significant, as also size appears negatively related to probability of exit within the group of FF (Model 9). However, the effect of size does not alter the foreignness impact during economic slowdowns. In models 6 to 10 the different interactions variables between downturn and size are not significant. Actually, recessions may act as a mere catalyst to firm death, exerting a detrimental impact upon firms' longevity (Box, 2008; Bhattacharjee et al., 2009).

#### 5.4. CONCLUDING REMARKS

Our results demonstrate that after controlling for firm and industry specificities, foreignness increases the firm exit. FF were found to be more prone to exit than DF with similar observable characteristics. However, the differences were only significant for foreign SMEs, while no difference is found between survival trends of DF and large foreign MNEs. Conversely, during crises, the differences between groups are attenuated and the foreignness effect turns out to be insignificant, which supports the generally accepted idea that recessions act as a vehicle to firm death, with DF being relatively more affected when compared to a normal situation (their hazard rates increase significantly, reducing the difference to FF). Table 16 presents a synopsis of all our empirical assessments of DF's and FF's behaviour during the economic slowdowns experienced by Portuguese economy.

**Table 16.** Summary of all empirical results

	<b>Sample</b>	<i>Employment Growth</i>	<i>Turnover Growth</i>	<i>Hazard Rates</i>
<b>Foreign Ownership</b> effect during crises	All Firms	n.s.	+	n.s.
	SMEs	n.s.	+	n.s.
	LEs	n.s.	n.s.	n.s.
<b>Firm Size</b> effect during crises	All Firms	-	∪	n.s.
	FF	n.s.	n.s.	n.s.

(-): significant negative effect; (+) significant positive effect; n.s.: no significant effect.



## CHAPTER 6

### CONCLUSIONS AND POLICY IMPLICATIONS

This dissertation has addressed an important, timely and still scarcely explored issue – the comparative dynamics and behaviour of foreign-owned and domestic-owned firms during crisis environments, in order to assess whether foreign affiliates behave any different, being able to overcome the adversities and thus act as stabilizer agents in host economies. Moreover, to the best of our knowledge, this is the first in-depth empirical study of this issue using a long time span of micro data for Portugal, a country with great challenges for convergence and with an active policy towards inward foreign direct investment. Accordingly, our approach contributes to the existing literature on foreign MNEs' role during crises by providing as well novel empirical evidence on the Portuguese experience under a crisis context.

Available firm-level empirical studies have hitherto provided mixed and indefinite results. Moreover, the extant evidence has typically been based on the Asian financial crisis of 1997-98, dealing with firms' performance, behaviour and dynamics either during or after crisis. Throughout this study, we have focused on the changes of firm performance and survival prospects during crisis events, given the importance of immediate actions by firms in taking advantage of potential opportunities or reacting to threats.

From our literature review and subsequent analysis of firm-level data, we have concluded that, unconditionally, foreign MNEs' affiliates are larger, relatively more productive, technologically more advanced, richer regarding human capital and also seem to have higher longevity. However, after controlling for several firms' and industries' characteristics, we have concluded that being foreign-owned implies lower sales turnover growth rates and higher hazard rates, despite no significant effect occurs upon firm's employment growth. Accordingly, to answer our first research question "Does foreign ownership helps to differentiate the performance and survival of firms?", our reply is

affirmative for firms' turnover growth and firms' survival, but negative regarding firms' employment growth.

By attending on the economic recessions suffered by Portuguese economy during the early 1990s and early 2000s, we have searched for a potentially different behaviour among foreign and domestic firms at these three variables. Our results demonstrated that both crises' events have impacted negatively on firms' employment growth, turnover growth and survival, thus leading to great increases in job losses, output contractions and business failure, at least in Portuguese manufacturing. However, the foreignness effect during these crises was mixed. When we controlled for firms' and industries' specificities, job losses in foreign firms were not significantly different from those in indigeneous firms. On the other hand, at turnover levels, foreign firms seem to have reacted better, maybe due to their organizational, managerial and technological advantages, adding to the advantages of multinationality, which probably have allowed them to cut operations and to smooth the decline in demand by screening and exploiting markets in a global way. Regarding survival and exit trends, the results show that during economic slowdowns the differences between firms were attenuated, so that the foreignness effect turns out to be insignificant, which supports the generally accepted idea that recessions act as a catalyst to firm death, with domestic firms being relatively more affected when compared to a normal setting. In summary, about the potential MNEs' stabilizer role that we have addressed in our second research question, we conclude that foreign firms acted as neutral elements at employment growth and exit risks, though potential stabilizer agents regarding firms' sales.

Finally, beyond the foreignness effect, we have assessed the importance of firm size to explain firm performance and survival during crises. We conclude that, throughout recessions, firm size exerts significant negative impacts on employment growth trends, significant non-linear effects on turnover growth, but no significant effect upon firm exit. Regarding the possible moderating effect of firm size on the foreignness' impact during slowdowns, our outcomes suggest that the effect of size upon foreign firms' behaviour is irrelevant in what concerns employment growth and exit rates, albeit significant for changes at turnover growth, since foreign SMEs have reacted better than foreign LEs. Table 17 summarizes our final answers to the previously defined research questions.

Our results have implications both for managers and policy-makers, being much more than a topic of academic interest. For managers, namely those of foreign firms, our

outcomes suggest that they should not rely on the observable advantages (size, human capital and productivity) as their failure risk is high, both under stable and unstable economic conditions. For policy, on the one hand, our results do not contest the option for active FDI attraction policies.

**Table 17.** Summary of responses to the research questions

Research Questions	Final response to the research questions by firm-level measure		
	<i>Firms' Employment Growth</i>	<i>Firms' Turnover Growth</i>	<i>Firm Survival</i>
<i>Does foreign ownership help to differentiate the performance and survival of firms?</i>	<b>No</b> – foreign ownership has a neutral impact on employment growth	<b>Yes</b> – foreign ownership has a significant negative impact on sales turnover growth.	<b>Yes</b> – foreign ownership has a significant positive impact on hazard rates (thus a negative impact on firm survival).
<i>Does the foreignness effect change during crises? i. e. Can foreign firms act, in some extent, as stabilizers during economic slowdowns?</i>	<b>No</b> – during economic slowdowns, job losses in foreign firms were not significantly different from those in domestic firms. Foreign firms acted as neutral elements.	<b>Yes</b> – during economic slowdowns, foreign firms were able to increase their sales turnover growth rates. Foreign firms acted as potential stabilizer elements.	<b>No</b> – during economic slowdowns, exit rates in foreign firms were not significantly different from those in domestic firms. Foreign firms acted as neutral elements.
<i>How firm size interferes with the 'foreign ownership effect' during economic slowdowns?</i>	Firm size has a negative impact on employment growth during economic slowdowns, but it does not moderate the foreign ownership effect.	Firm size interferes with the foreign ownership effect during economic slowdowns – only foreign SMEs have reacted better than DF; large FF did not behave differently than DF.	Firm size seems to have a neutral effect on firm exit during economic slowdowns and it does not interfere with the foreign ownership effect.

On the other hand, the conclusions are not supportive of a discriminatory policy in favour of foreign firms. As regards the evaluation of the potential advantages arising from MNEs' presence during recessions, the results indicate that MNEs do not exert a disturbing effect on host economy employment and that may even contribute to smooth the declines in sales turnover. As regards their survival dynamics, the outcomes show that there is no need to fear that foreign firms destabilize the host economy more than usual by immediately closing down operations during slowdowns. Accordingly, what seems crucial is the role of host governments in restoring foreign investors' confidence about the future and showing that the crisis may also be an opportunity to reorganize themselves and become more efficient, rather than just a threat. However, there are no strong reasons to expect positive gains from FDI in what concerns their potential recovery-enhancer role. There are certainly other arguments that justify the FDI attraction policies by an economy such as the Portuguese one (e.g., knowledge transfers or structural change), but they should not be mainly based on the expectations about MNEs' greater abilities to thrive a crisis.





## REFERENCES

- Acs, Z., Armington, C. (2009), "New firm survival and human capital", in Karlsson, C., Johansson, B., Stough, R. (Eds.), *Entrepreneurship and Dynamics in the Knowledge Economy*, 125-148, UK: Routledge.
- Agarwal, R. (1997), "Survival of firms over the product life cycle", *Southern Economic Journal*, 63, 3, 571-584.
- Almeida, R. (2003), "The effects of foreign owned firms on the labor market", *IZA Discussion Papers*, IZA Discussion Paper No. 785.
- Altman, E. (1968), "Financial ratios, discriminant analysis, and the prediction of corporate bankruptcy", *Journal of Finance*, 23, 580-609.
- Álvarez, R., Görg, H. (2007), "Multinationals as stabilizers?: economic crisis and plant employment growth", *Central Bank of Chile*, Working Paper No. 412.
- Álvarez, R., Görg, H. (2009), "Multinationals and plant exit: evidence from Chile", *International Review of Economics and Finance*, 18, 45-51.
- Anastassopoulos, G. (2003), "MNE subsidiaries versus domestic enterprises: an analysis of their ownership and location-specific advantages", *Applied Economics*, 35, 13, 1405-1514.
- Andersson, U., Forsgren, M., Pederson, T. (2001), "Subsidiary performance in multinational corporations: the importance of technology embeddedness", *International Business Review*, 10, 3-23.
- Athukorala, P. (2003), "FDI in crisis and recovery: lessons from the 1997-1998 Asian crisis", *Australian Economic Review*, 43, 197-213.
- Audretsch, D. (1995), "Innovation, growth and survival", *International Journal of Industrial Organization*, 13, 441-457.
- Audretsch, D., Acs, Z. (1994), "New-firm startups, technology and macroeconomic fluctuations", *Small Business Economics*, 6, 439-449.
- Audretsch, D., Mahmood, T. (1994), "The rate of hazard confronting new firms and plants in U.S. manufacturing", *Review of Industrial Organization*, 9, 41-56.
- Audretsch, D., Mahmood, T. (1995), "New firm survival: new results using a hazard function", *Review of Economics and Statistics*, 77, 97-103.
- Aw, B. (2002), "Accumulating technology and location spillovers among firms in Taiwan's electronics industry", *The Journal of Development Studies*, 39, 1, 94-117.
- Aydin, N., Sayim, M., Yalama, A. (2007), "Foreign ownership and firm performance: evidence from Turkey", *International Research Journal of Finance and Economics*, 11, 103-111.

Baldwin, J., Gu, W. (2004), "Innovation, survival and performance of Canadian manufacturing plants", *Economic Analysis Research Paper Series*, Working Paper No. 022.

Bamiatzi, V., Bozos, K., Nikolopoulos, K. (2010), "On the predictability of firm performance via simple time-series and econometric models: evidence from UK SMEs", *Applied Economic Letters*, 17, 3, 279-282.

Bandick, R., Görg, H. (2009), "Foreign acquisition, plant survival, and employment growth", *Kiel Institute for the World Economy*, Kiel Working Paper 1525.

Bank of Portugal (2009a), "A Economia Portuguesa em 2008", *Economic Bulletin*, Spring.

Bank of Portugal (2009b), "Perspectivas para a Economia Portuguesa: 2009-2011", *Economic Bulletin*, Winter.

Barbosa, N., Louri, H. (2005), "Corporate performance: does ownership matter? A comparison of foreign- and domestic-owned firms in Greece and Portugal", *Review of Industrial Organization*, 27, 1, 73-102.

Barbosa, N., Guimarães, P., Woodward, D. (2004), "Foreign entry in an open economy: the case of Portugal", *Applied Economics*, 36, 5, 465 – 472.

Bates, T. (1990), "Entrepreneur human capital inputs and small business longevity", *Review of Economics and Statistics*, 62, 4, 551-559.

Beck, T., Demirgüç-Kunt, A., Maksimovic, V. (2005), "Financial and legal constraints to growth: does firm size matter?", *The Journal of Finance*, 60, 1, 137-177.

Behrman, J., Deolalikar, A. (1989), "...Of the fittest? Duration of survival of manufacturing establishments in a developing country", *The Journal of Industrial Economics*, 38, 2, 215-226.

Belderbos, R., Zou, J. (2007), "On the growth of foreign affiliates: multinational plant networks, joint ventures and flexibility", *Journal of International Business Studies*, 38, 7, 1095-1112.

Bellak, C. (2004a), "How performance gaps between domestic firms and foreign affiliates matter for economic policy?", *Transnational Corporations*, 13, 2, 29-55.

Bellak, C. (2004b), "How domestic and foreign firms differ and why does it matter?", *Journal of Economics Surveys*, 18, 4, 483-514.

Benfratello, L., Sembenelli, A. (2006), "Foreign ownership and productivity: is the direction of causality so obvious?", *International Journal of Industrial Organization*, 24, 733-751.

Bernard, A., Jensen, B. (2007), "Firm structure, multinationals and manufacturing plant deaths", *The Review of Economics and Statistics*, 89, 2, 193-204.

- Bernard, A., Sjöholm, F. (2003), “Foreign owners and plant survival”, *National Bureau of Economic Research*, NBER Working Paper No. 10039.
- Berry, A., Rodriguez, E., Sandee, H. (2001), “Small and medium enterprise dynamics in Indonesia”, *Bulletin of Indonesian Economic Studies*, 37, 3, 363–8.
- Bhattacharjee, A., Higson, C., Holly, S., Kattuman, P. (2009), “Macroeconomic instability and business exit: determinants of failures and acquisitions of UK firms”, *Economica*, 76, 108-131.
- Blalock, G., Gertler, P., Levine, D. (2005), “Investment following a financial crisis: does foreign ownership matter?”, Mimeo, Cornell University.
- Blomström, M., Sjöholm, F. (1999), “Foreign direct investment, technology transfer and spillovers: does local participation with multinationals matter?”, *European Economic Review*, 43, 915-923.
- Blomström, M., Kokko, A. (1998), “Multinational corporations and spillovers”, *Journal of Economic Surveys*, 12, 247-277.
- Boeri, T., Bellman, L. (1995), “Post-entry behaviour and the cycle: evidence from Germany”, *International Journal of Industrial Organization*, 13, 483-500.
- Bonn, I. (2000), “Staying on top: characteristics of long-term survival”, *Journal of Organizational Change Management*, 13, 1, 32-48.
- Box, M. (2008), “The deaths of firms: exploring the effects of environment and birth cohort of firm survival in Sweden”, *Small Business Economics*, 31, 379-393.
- Bridges, S., Guariglia, A. (2008), “Financial constraints, global engagement and firm survival in the United Kingdom: evidence from micro data”, *Scottish Journal of Political Economy*, 55,4, 444-464.
- Butler, J., Sullivan, J. (2005), “Crisis response tactics: U.S. SMEs’ responses to the Asian financial crisis”, *Journal of Business and Entrepreneurship*, 17, 2.
- Cabral, S. (1996), “Comparative export behaviour of foreign and domestic firms in Portugal”, *Bank of Portugal*, Working Paper No. 8/96.
- Cardoso, V. (2008), *Foreign multinationals and domestic companies in Portugal: are there significant performance gaps?*, Master Thesis presented to Faculty of Economics, University of Porto: Portugal.
- Caves, R. (1974), “Multinational firms, competition and productivity in host-country markets”, *Economica*, 41, 176-193.
- Caves, R. (1996), *Multinational enterprise and economic analysis* (2<sup>nd</sup> Ed.), Cambridge: Cambridge University Press.

- Chen, C., So, R. (2002), "Exchange rate variability and the riskiness of US multinational firms: evidence from the Asian financial turmoil", *Journal of Multinational Financial Management*, 12, 411-428.
- Chhibber, P., Majumdar, S. (1999), "Foreign ownership and profitability: property rights, strategic control and corporate performance in Indian industry", *The William Davidson Institute*, Working Paper No. 64.
- Chung, C., Beamish, P. (2005a), "The impact of institutional reforms on characteristics and survival of foreign subsidiaries in emerging economies", *Journal of Management Studies*, 42, 1, 35-62.
- Chung, C., Beamish, P. (2005b), "Investment mode strategy and expatriate strategy during times of economic crisis", *Journal of International Management*, 11, 331-355.
- Chung, C., Lu, J., Beamish, P. (2008), "Multinational networks during times of economic crisis versus stability", *Management International Review*, 48, 3, 279-296.
- Claessens, S., Djankov, S., Xu, L. (2000), "Corporate performance in the East Asian financial crisis", *The World Bank Research Observer*, 15, 1, 23-46.
- Coad, A. (2009), *The growth of firms: a survey of theories and empirical evidence (New perspectives on the modern corporation)*, Cheltenham: Edward Elgar Publishing.
- Cox, D. (1972), "Regression models and life tables", *Journal of the Royal Statistical Society*, Series B34, 187-220.
- Criscuolo, C. (2005), "Foreign affiliates in OECD economies: presence, performance and contribution to host countries' growth", *OECD Economic Studies No. 41*, 109-137, 2005/2.
- Das, K., Pradhan, J. (2009), "Externally-oriented small and medium enterprises: predicament and possibilities", *Munich Personal RePEc Archive*, MPRA Paper No. 15522.
- Delios, A., Beamish, P. (2001), "Survival and profitability: the roles of experience and intangible assets in foreign subsidiary performance", *Academy of Management Journal*, 44, 5, 1028-1038.
- Desai, M., Foley, C., Forbes, K. (2004), "Financial constraints and growth: multinational and local firm responses to currency crises", *National Bureau of Economic Research*, NBER Working Paper No. 10545.
- Dhanaraj, C., Beamish, P. (2004), "Effect of equity ownership on the survival of international joint ventures", *Strategic Management Journal*, 25, 295-305.
- Disney, R., Haskel, J., Heden, Y. (2003), "Entry, exit and establishment survival in UK manufacturing", *Journal of Industrial Economics*, 51, 91-122.
- Domaç, I., Ferri, G. (1999), "Did the East Asian crisis disproportionately hit small business in Korea?", *Economic Notes*, 28, 3, 403-429.

- Doms, M., Jensen, J. (1998), "Comparing wages, skills, and productivity between domestically and foreign-owned manufacturing establishments in the United States", in: Baldwin, R.E., R.E. Lipsey, and J.D. Richardson (Eds.), *Geography and Ownership as Bases for Economic Accounting, Studies in Income and Wealth*, 235-255, NBER Book Series Studies in Income and Wealth, Volume 59.
- Dunne, P., Hughes, A. (1994), "Age, size, growth and survival: UK companies in the 1980s", *Journal of Industrial Economics*, 42, 2, 115-140.
- Dunning, J. (1981), *International Production and Multinational Enterprise*, London: George Allen and Unwin.
- Dunning, J. (1988), "The eclectic paradigm of international production: A restatement and some possible extensions", *Journal of International Business Studies*, Spring: 1-31.
- Dunning, J. (1993), *Multinational enterprises and the global economy*, New York: Addison-Wesley.
- Dunning, J., Lundan, S. (2008), *Multinational enterprises and the global economy* (2<sup>nd</sup> ed.), Cheltenham: Edward Elgar.
- Edgington, D., Hayter, R. (2001), "Japanese direct foreign investment and the Asian financial crisis", *Geoforum*, 32, 103-120.
- Ericson, R., Pakes, A. (1995), "Markov-perfect industry dynamics: a framework for empirical work", *Review of Economic Studies*, 62, 53–82.
- Ernst, C. (2005), "The FDI-employment link in a globalizing world: the case of Argentina, Brazil and Mexico", *Employment Strategy Papers*, Employment Strategy Department.
- Evans, D. (1987), "The relationship between firm growth, size and age: estimates for 100 manufacturing industries", *Journal of Industrial Economics*, 35, 4, 567-581.
- Farinha, L., Mata, J. (1996), "The impact of foreign direct investment in the Portuguese economy", *Bank of Portugal*, Working Paper No. 16/96.
- Feliciano, Z., Lipsey, R. (1999), "Foreign ownership and wages in the United States, 1987 – 1992", *National Bureau of Economic Research*, NBER Working Paper No. 6923.
- Fertala, N. (2008), "The shadow of death: do regional differences matter for firm survival across native and immigrant entrepreneurs?", *Empirica*, 35, 59-80.
- Fichman, M., Levinthal, D. (1991), "Honeymoons and the liability of adolescence: a new perspective on duration dependence in social and organizational relationships", *Academic Management Review*, 16, 442–468.
- Flamm, K. (1984), "The volatility of offshore investment", *Journal of Development Economics*, 16, 231–248.

- Forbes, K. (2002), "How do large depreciations affect firm performance?", *National Bureau of Economic Research*, NBER Working Paper No. 9095.
- Forsgren, M., Pedersen, T., Foss, N. (1999), "Accounting for the strengths of MNC subsidiaries: the case of foreign-owned firms in Denmark", *International Business Review*, 8, 2, 181-196.
- Fotopoulos, G., Louri, H. (2000), "Location and survival of new entry", *Small Business Economics*, 14, 311-321.
- Freitas, M. L., Paes Mamede, R. (2008), "Structural transformations and the role of foreign direct investment in Portugal: a descriptive analysis for the period 1990-2005", *GEE Papers*, Working Paper No. 9.
- Fukao, K. (2001), "How Japanese subsidiaries in Asia responded to the regional crisis - an empirical analysis based on the MITI survey", in Ito, T., Krueger, A. (Eds.), *Regional and global capital flows: macroeconomics causes and consequences*, 267-310, NBER-EASE Volume 10, NBER Books.
- Gao, T., Eshaghoff, T. (2004), "MNCs' preferred responses to the Argentine financial crisis: a classification and empirical investigation", *Latin American Business Review*, 5, 1, 23-44.
- Geishecker, I., Görg, H., Taglioni, D. (2008), "Characterizing Euro area multinationals", *Kiel Institute for the World Economy*, Kiel Working Paper No. 1413.
- Geroski, P. (1995), "What do we know about entry?", *International Journal of Industrial Organization*, 13, 421-440.
- Geroski, P., Mata, J., Portugal, P. (2010), "Founding conditions and the survival of new firms", *Strategic Management Journal*, 31, 510-529.
- Gertler, M., Gilchrist, S. (1994), "Monetary policy, business cycles and the behavior of small manufacturing firms", *The Quarterly Journal of Economics*, 109, 2, 309-340.
- Girma, S., Gong, Y. (2008), "Putting people first? Chinese state-owned enterprises' adjustment to globalization", *International Journal of Industrial Organization*, 26, 573-585.
- Globerman, S., Ries, J., Vertinsky, I. (1994), "The economic performance of foreign affiliates in Canada", *Canadian Journal of Economics*, Canadian Economics Association, 27, 1, 143-156.
- Gonçalves, O., Guimarães, P. (1997), "O investimento directo estrangeiro na indústria transformadora portuguesa: uma abordagem sectorial e regional através do emprego para o período 1982-1992", *Estudos de Economia*, 16-17, 3, 333-358.
- Görg, H., Greenaway, D. (2003), "Much ado about nothing? Do domestic firms really benefit from foreign direct investment?", *IZA Discussion Papers*, IZA Discussion Paper No. 944.

- Görg, H., Strobl, E. (2000), “Multinational companies, technology spillovers and firm survival: evidence from Irish manufacturing”, *Centre for Research on Globalisation and Labour Markets*, Working Paper No. 12.
- Görg, H., Strobl, E. (2003a), “Footloose’ multinationals?”, *The Manchester School*, 71, 1, 1-19.
- Görg, H., Strobl, E. (2003b), “Multinational companies, technology spillovers and plant survival”, *Scandinavian Journal of Economics*, 105, 4, 581-595.
- Greene, W. (2008), *Econometric Analysis* (6<sup>th</sup> Ed.), New York: Prentice Hall.
- Gregory, G., Harvie, C., Lee, H. (2002), “Korean SMEs in the wake of the financial crisis: strategies, constraints and performance in a global economy”, mimeo, University of Wollongong.
- Griffith, R., Simpson, H. (2001), “Characteristics of foreign-owned firms in British manufacturing”, *Institute for Fiscal Studies*, Working Paper No. 01/10.
- Gugler, K. (1998), “Corporate ownership structure in Austria”, *Empirica*, 25, 3, 285-307.
- Guimarães, P., Figueiredo, O., Woodward, D. (2000), “Agglomeration and the location of foreign direct investment in Portugal”, *Journal of Urban Economics*, 47, 115-135.
- Hall, C., Harvie, C. (2003), “A comparison of the performance of SMEs in Korea and Taiwan: policy implications for turbulent times”, mimeo, University of Wollongong.
- Hallward-Driemeier, M., Wallsten, S., Xu, L. (2006), “Ownership, investment climate and firm performance – evidence from Chinese firms”, *Economics of Transition*, 14, 4, 629-647.
- Hamilton, L. (2006), *Statistics with Stata*, USA: Thompson Books/Cole.
- Hanson, G. (2001), “Should countries promote foreign direct investment?”, *G24 Discussion Paper Series No. 9*, New York and Geneva: United Nations.
- Harvie, C. (2003), “The contribution of micro-enterprises to economic recovery and poverty alleviation in East Asia”, mimeo, University of Wollongong.
- Heiss, F., Köke, J. (2004), “Dynamics in ownership and firm survival: evidence from corporate Germany”, *European Financial Management*, 10, 167–195.
- Helmets, C., Rogers, M. (2008), “Innovation and the survival of new firms across British regions”, *Discussion Paper Series - University of Oxford*, Working Paper No.416.
- Hennart, J. (1982), *A theory of multinational enterprise*, University of Michigan Press: Ann Arbor.
- Higson, C., Holly, S., Kattuman, P. (2002), “The cross-sectional dynamics of the US business cycle: 1950–1999”, *Journal of Economic Dynamics & Control*, 26, 1539-1555.

- Higson, C., Holly, S., Kattuman, P., Platis, S. (2004), "The business cycle, macroeconomic shocks and the cross-section: the growth of UK quoted companies", *Economica*, 71, 299-318.
- Hill, J., Nancarrow, C., Wright, L. (2002), "Lifecycles and crisis points in SMEs: a case approach", *Marketing Intelligence & Planning*, 20, 6, 361-369.
- Hodorogel, R. (2009), "The economic crisis and its effects on SMEs", *Theoretical and Applied Economics*, 5, 5, 79-88.
- Holmes, P., Hunt, A., Stone, I. (2010), "An analysis of new firm survival using a hazard function", *Applied Economics*, 42, 2, 185-195.
- Hosmer, D., Lemeshow, S., May, S. (2008), *Applied survival analysis – Regression modeling of time-to-event data*, Hoboken, New Jersey: Wiley-Interscience, John Wiley & Sons, Inc.
- Howenstine, N., Zeile, W. (1992), "Foreign direct investment in the United States: establishment data for 1987", *Survey of Current Business*, October, 44-58.
- Hult, G., Ketchen Jr., D., Griffith, D., Chabowski, B., Hamman, M., Dykes, B., Pollitte, W., Cavusgil, S. (2008), "An assessment of the measurement of performance in International Business research", *Journal of International Business Studies*, 39, 1064-1080.
- Hymer, S. (1976), *The international operations of national firms: a study on direct foreign investment*, Cambridge (MA): MIT Press.
- Ihrig, J., Prior, D. (2005), "The effect of exchange rate fluctuations on multinationals' returns", *Journal of Multinational Financial Management*, 15, 273-286.
- Iimakunnas, P., Topi, J. (1999), "Microeconomic and macroeconomic influences on entry and exits of firms", *Review of Industrial Organization*, 15, 3, 283-301.
- Jimeno, J., Cantó, O., Cardoso, A., Izquierdo, M., Rodrigues, C. (2000), "Integration and inequality: lessons from the accessions of Portugal and Spain to the EU", *FEDEA*, Working Paper No. 2000-10.
- Jovanovic, B. (1982), "Selection and the evolution of industry", *Econometrica*, 50, 649–670.
- Kalbfleisch, J., Prentice, R. (1980), *The statistical analysis of failure data*, New York: Wiley.
- Karlsson, S., Lundin, N., Sjöholm, F., He, P. (2009), "Foreign firms and Chinese employment", *The World Economy*, 31, 1, 178-201.
- Kim, W., Lyn, E. (1990), "FDI theories and the performance of foreign multinationals operating in the U.S.", *Journal of International Business Studies*, 21, 1, 41-54.



- Kimura, F., Fujii, T. (2003), “Globalizing activities and the rate of survival: panel data analysis on Japanese firms”, *Journal of the Japanese and International Economies*, 17, 538-560.
- Kimura, F., Kiyota, K. (2006), “Exports, FDI and productivity: dynamic evidence from Japanese firms”, *Review of World Economics*, 142, 4, 695-719.
- Kimura, F., Kiyota, K. (2007), “Foreign-owned versus domestically-owned firms: economic performance in Japan”, *Review of Development Economics*, 11, 1, 31-48.
- Köke, J. (2002), “Determinants of acquisition and failure: evidence from corporate Germany”, *Structural Change and Economic Dynamics*, 13, 4, 457–484.
- Kronborg, D., Thomsen, S. (2009), “Foreign ownership and long-term survival”, *Strategic Management Journal*, 30, 207-219.
- Kuemmerle, W. (1999), “The drivers of foreign direct investment into research and development – an empirical investigation”, *Journal of International Business Studies*, 30, 1, 1-24.
- Kumar, M. (1984), “Comparative analysis of UK domestic and international firms”, *Journal of Economic Studies*, 11, 3, 26-42.
- Kumar, N. (1990), “Mobility barriers and profitability of multinational and local enterprises in Indian manufacturing”, *The Journal of Industrial Economics*, 38, 4, 449-463.
- Larsen, K., Bjerkeland, K. (2005), “Are unexpected loan losses lower for small enterprises than for large enterprises?”, *Norges Bank, Economic Bulletin Q3*, 126-132.
- Lee, S., Makhija, M. (2009), “Flexibility in internationalization: is it valuable during an economic crisis?”, *Strategic Management Journal*, 30, 537-555.
- Legewie, J. (1999), “Manufacturing strategies for Southeast Asia after the crisis: European, US and Japanese firms”, *Business Strategy Review*, 10, 4, 55-64.
- Li, J. (1995), “Foreign entry and survival: effects of strategies on performance in international markets”, *Strategic Management Journal*, 16, 5, 333-351.
- Li, J., Guisinger, S. (1991), “Comparative business failures of foreign-controlled firms in the United States”, *Journal of International Business Studies*, 22, 2, 209-224.
- Lin, P., Huang, D. (2008), “Technological regimes and firm survival: evidence across sectors and over time”, *Small Business Economics*, 30, 175-186.
- Lipsey, R. (2001), “Foreign investment in three financial crisis”, *National Bureau of Economic Research*, NBER Working Paper No. 8084.
- Littunen, H. (2000), “Networks and local environmental characteristics in the survival of new firms.”, *Small Business Economics*, 15, 59-71.

- Liu, J. (2004), “Macroeconomic determinants of corporate failures: evidence from the UK”, *Applied Economics*, 36, 939-945.
- Luo, Y., Tan, J. (1998), “A comparison of multinational and domestic firms in an emerging market: a strategic perspective”, *Journal of International Management*, 4, 1, 21-40.
- Magalhães, M., Africano, A. (2007), “A panel analysis of the FDI impact on international trade”, *NIPE Working Papers – University of Minho*, Working Paper No.6.
- Mahmood, T. (1992), “Does the hazard rate for new plants vary between low- and high-tech industries?”, *Small Business Economics*, 4, 201-209.
- Manjón-Antolín, M., Arauzo-Carod, J. (2008), “Firm survival: methods and evidence”, *Empirica*, 35, 1-24.
- Marino, L., Lohrke, F., Hill, J., Weaver, K., Tambunan, T. (2008), “Environmental shocks and SME alliance formation intentions in an emerging economy: evidence from the Asian financial crisis in Indonesia”, *Entrepreneurship Theory and Practice*, 32, 1, 157-183.
- Markusen, A., Nesse, K. (2007), “Institutional and political determinants of incentive competition: reassessing causes, outcomes, remedies”, in Markusen, A. (Ed.), *Reining in the Competition for Capital: International Perspective*, 1-41, W. E. Upjohn Institute for Employment Research: Kalamizoo Michigan.
- Markusen, J. R. (1995), “The boundaries of multinational enterprises and the theory of international trade”, *Journal of Economic Perspectives*, 9, 2, 169-189.
- Martins, P. (2008), “Paying more to hire the best?”, *IZA Discussion Papers*, IZA Discussion Paper No. 3607.
- Mata, J., Portugal, P. (1994), “Life duration of new firms”, *Journal of Industrial Economics*, 42, 3, 227-245.
- Mata, J., Portugal, P. (1999), “Closure and divestiture by foreign entrants: the impact of entry and post-entry strategies”, *Bank of Portugal*, Working Paper No. 6/99.
- Mata, J., Portugal, P. (2002), “The survival of new domestic and foreign-owned firms”, *Strategic Management Journal*, 23, 323–562.
- Mata, J., Portugal, P. (2004), “Patterns of entry, post-entry growth and survival”, *Small Business Economics*, 22, 283-298.
- Mata, J., Portugal, P., Guimarães, P. (1995), “The survival of new plants: start-up conditions and post-entry evolution”, *International Journal of Industrial Organization*, 13, 459–481.
- Matalony, R. (2000), “An examination of the low rates of return of foreign-owned U.S. companies”, *Survey of Current Business*, March, 55-73.

- McAleese, D., Counahan, M. (1979), “Stickers or snatchers? Employment in multinational corporations during recessions”, *Oxford Bulletin of Economics and Statistics*, 41, 345-358.
- Min, B., Rhim, J., Friesner, D., Cashel-Cordo, P. (2007), “On the behavior of global multinational enterprises during the 1997 Asian financial crisis”, *The Journal of Economic Development and Business Policy*, 1, 52-89.
- Móden, K., Norbäck, P., Persson, L. (2007), “Efficiency and ownership structure – the case of Poland”, *Research Institute of Industrial Economics*, IFN Working Paper No. 703.
- Mulhern, A. (1996), “Venezuelan small businesses and the economic crisis: reflections from Europe”, *International Journal of Entrepreneurial Behaviour & Research*, 2, 2, 69-81.
- Narjoko, D., Hill, H. (2007), “Winners and losers during a deep economic crisis: firm-level evidence from Indonesian manufacturing”, *Asian Economic Journal*, 21,4, 343-368.
- Nugent, J., Yhee, S. (2002), “Small and medium enterprises in Korea: achievements, constraints and policy issues”, *Small Business Economics*, 18, 85-119.
- OECD (1994), “OECD reviews on foreign direct investment – Portugal”, *OECD Reviews on Foreign Direct Investment*, April.
- OECD (2009), “The impact of the global crisis on SME and entrepreneurship financing and policy responses”, *Centre for Entrepreneurship, SMEs and Local Development, Organization for Economic Cooperation and Development*.
- Ortega-Argilés, R., Moreno, R. (2005), “Firm competitive strategies and the likelihood of survival: the Spanish case”, *Paper presented at 45<sup>th</sup> Congress of the European Regional Science Association*, Amsterdam, August.
- Oulton, N. (1998a), “Investment, capital and foreign ownership in UK manufacturing”, *NIESR Discussion Papers*, Discussion Paper No. 141, August.
- Oulton, N. (1998b), “Labour productivity and foreign ownership”, *NIESR Discussion Papers*, Discussion Paper No. 143, September.
- Oxelheim, L., Ghauri, P. (2004), *European Union and the Race for Foreign Direct Investment in Europe*, Oxford UK: Elsevier.
- Özar, S., Özertan, G., Irfanoglu, Z. (2008), “Micro and small enterprise growth in Turkey: under the shadow of financial crisis”, *The Developing Economies*, 46, 4, 331-362.
- Özler, S., Taymaz, E. (2004), “Does foreign ownership matter for survival and growth? Dynamics of competition and foreign direct investment”, *Economic Research Center*, Working Paper No. 04/06.
- Pananond, P. (2007), “The changing dynamics of Thai multinationals after the Asian economic crisis”, *Journal of International Management*, 13, 3, 356-375.

- Pérez, S., Llopis, A., Llopis, J. (2004), “The determinants of survival of Spanish manufacturing firms”, *Review of Industrial Organization*, 25, 251-273.
- Pérez, S., Llopis, A., Llopis, J. (2010), “A competing risks analysis of firms’ exit”, *Empirical Economics*, 38, 281-304.
- Pfaffermayr, M., Bellak, C. (2002), “Why foreign-owned firms are different: a conceptual framework and empirical evidence for Austria”, *Hamburg Institute of International Economics*, HWWA Discussion Paper No. 115.
- Poon, J., Thompson, E. (2001), “Effects of the Asian financial crisis on transnational capital”, *Geoforum*, 32, 121-131.
- Ramstetter, E. (1999), “Comparisons of foreign multinationals and local firms in Asian manufacturing over time”, *Asian economic Journal*, 12, 2, 163-203.
- Régnier, P. (2005), “The East Asian financial crisis in Thailand: distress and resilience of local SMEs”, in Harvie, C., Lee, B. (Eds.), *Sustaining growth and performance in East Asia – The role of small and medium-sized enterprises*, 148-160, USA: Edward Elgar Publishing, Inc..
- Sato, Y. (2000), “How did the crisis affect small and medium-sized enterprises? From a field study of the metal-working industry in Java”, *The Developing Economies*, XXXVIII, 4, 572–95.
- Singer, J., Willett, J. (1993), “It’s about time: using discrete-time survival analysis to study duration and the timing of events”, *Journal of Educational Statistics*, 18, 2, 155-195.
- Sleuwaegen, L., De Backer, K. (2003a), “Foreign ownership and productivity dynamics?”, *Economic Letters*, 79, 2, 177-183.
- Sleuwaegen, L., De Backer, K. (2003b), “Does foreign direct investment crowd out domestic entrepreneurship?”, *Review of Industrial Organization*, 22, 67-24.
- Stearns, T., Carter, N., Reynolds, P., Williams, M. (1995), “New firm survival: industry, strategy and location”, *Journal of Business Venturing*, 10, 23-42.
- Strotmann, H. (2007), “Entrepreneurial survival”, *Small Business Economics*, 28, 87–104.
- Takii, S., Ramstetter, E. (2005), “Multinational presence and labour productivity differentials in Indonesian manufacturing, 1975-2001”, *Bulletin of Indonesian Economic Studies*, 41, 2, 221-242.
- Tan, H., See, H. (2004), “Strategic reorientation and responses to the Asian financial crisis: the case of the manufacturing industry in Singapore”, *Asia Pacific Journal of Management*, 21, 189–211.
- Tavares, A. T. (2002), “Multinational subsidiary evolution and public policy: two tales from the European periphery”, *Journal of Industry, Competition and Trade*, 2, 3, 195-213.

- Tavares, A. T., Young, S. (2006), “Sourcing patterns of foreign-owned multinational subsidiaries in Europe”, *Regional Studies*, 40, 583-599.
- Taylor, K., Driffield, N. (2004), “Wage inequality and the role of multinationals. Evidence from UK panel data”, *Labour Economics*, 12, 2, 223-249.
- Taymaz, E., Özler, S. (2007), “Foreign ownership, competition and survival dynamics”, *Review of Industrial Organization*, 31, 23-42.
- Teixeira, A. (2002), “On the link between human capital and firm performance”, *FEP Working Papers – University of Porto*, Working Paper No. 121.
- Teixeira, A., Vieira, P. (2004a), “Quando a contratação de trabalhadores com elevada escolaridade aumenta o risco de falência”, *XIV Jornadas Luso-Espanholas de Gestão Científica*, Ponta Delgada, Açores, Fevereiro.
- Teixeira, A., Vieira, P. (2004b), “Why do firms hire so few top skilled workers? A model of knowledge transfer within firms”, *International Conference on Policy Modeling*, Paris, France, June.
- Teixeira, A., Tavares-Lehmann, A. T. (2007), *Investimento Directo Estrangeiro, Capital Humano e Inovação. Uma Aplicação ao Caso Português*, Porto: Vida Económica.
- Teixeira, A., Vieira, P. (2005), “Capital humano, falências empresariais e produtividade. Uma análise empírica das regiões Portuguesas”, *Estudos Regionais*, 7, 5-18.
- ter Wengel, J., Rodriguez, E. (2006), “SME export performance in Indonesia after the crisis”, *Small Business Economics*, 26, 25–37.
- Thompson, E. (2001), “Multinational firm responses to an Asian crisis comeback: evidence from European transnationals”, *The Pacific Review*, 14, 2, 269-287.
- Thompson, E., Poon, J. (2000), “ASEAN after the financial crisis: links between foreign direct investment and regulatory change”, *ASEAN Economic Bulletin*, 17, 1, 1-14.
- Ushijima, T. (2005), “Internal capital market and the growth and survival of Japanese plants in the United States”, *Journal of the Japanese and International Economies*, 19, 366-385.
- Van Beveren, I. (2007), “Footloose multinationals in Belgium?”, *Review of World Economics*, 143, 3, 483-507.
- Van Geenhuizen, M., Nijkamp, P. (1994), “A demographic approach: formation of new firms and survival of old ones”, *Faculteit der Economische Wetenschappen en Econometrie*, Working Paper No. 25.
- Vernon, R. (1966), “International investment and international trade in the product cycle”, *Quarterly Journal of Economics*, LXXX, 190-207.

Wagner, J. (1994), "The post-entry performance of new firms in German manufacturing industries", *Journal of Industrial Economics*, 42, 141–154.

Wang, H., Huang, H., Bansal, P. (2005), "What determined success during the Asian economic crisis? – The importance of experiential knowledge and group affiliation", *Asia Pacific Journal of Management*, 22, 89-106.

Willmore, L. (1992), "Transnationals and foreign trade: evidence from Brazil", *Journal of Development Studies*, 28, 2, 314-335.

Xu, D., Lu, J. (2007), "Technological knowledge, product relatedness and parent control: the effect on IJV survival", *Journal of Business Research*, 60, 1166-1176.

Xu, D., Pan, Y., Wu, C., Yim, B. (2006), "Performance of domestic and foreign-invested enterprises in China", *Journal of World Business*, 41, 261-274.

Zaheer, S. (1995), "Overcoming the liability of foreignness", *The Academy of Management Journal*, 38, 2, 341-363.

Zaheer, S., Mosakowski, E. (1997), "The dynamics of the liability of foreignness: a global study of survival in financial services", *Strategic Management Journal*, 18, 6, 439-464.

## APPENDIX

### A. Empirical Results – Employment and Turnover Growth by Technological Complexity of PMI

	Firm's EMPLOYMENT GROWTH			Firm's TURNOVER GROWTH		
	Low-Tech Manufacturing Industries	Medium-Low Tech Manufacturing Industries	Medium- High/High Tech Manufacturing Industries	Low-Tech Manufacturing Industries	Medium-Low Tech Manufacturing Industries	Medium- High/High Tech Manufacturing Industries
Constant	0.4689 *** (0.0356)	0.6009 *** (0.0441)	0.7205 *** (0.0391)	-7.2558 *** (0.0763)	-8.1595 *** (0.0951)	-4.6054 *** (0.0776)
Age	0.0002 ** (0.0001)	0.0002 (0.0002)	-0.0005 *** (0.0002)	-0.0087 *** (0.0002)	-0.0058 *** (0.0005)	-0.0013 *** (0.0004)
Age squared	-1.03e-07 ** (4.68e-08)	-1.18e-07 (1.08e-07)	2.53e-07 *** (9.66e-08)	4.30e-06 *** (9.77e-08)	2.84e-06 *** (2.28e-07)	6.39e-07 *** (1.90e-07)
Size	0.4695 *** (0.0025)	0.4462 *** (0.0055)	0.4451 *** (0.0041)	0.5303 *** (0.0053)	0.4720 *** (0.0119)	0.4722 *** (0.0081)
Size squared	-0.0366 *** (0.0005)	-0.0330 *** (0.0011)	-0.0342 *** (0.0008)	-0.0475 *** (0.0011)	-0.0347 *** (0.0023)	-0.0376 *** (0.0017)
Firm Performance	-0.1288 *** (0.0008)	-0.1313 *** (0.0018)	-0.1522 *** (0.0015)	0.5929 *** (0.0019)	0.5936 *** (0.0041)	0.6272 *** (0.0031)
Human Capital	-0.1356 *** (0.0113)	-0.1927 *** (0.0201)	-0.1498 *** (0.0159)	-0.3178 *** (0.0242)	-0.2296 *** (0.0432)	-0.2301 *** (0.0319)
Ownership	-0.0138 (0.0095)	-0.0145 (0.0128)	0.0260 ** (0.0129)	-0.1733 *** (0.0201)	-0.1619 *** (0.0274)	-0.0970 *** (0.0257)
Urban	0.0009 (0.0102)	0.0478 ** (0.0188)	-0.0182 (0.0151)	0.0068 (0.0217)	0.0475 (0.0408)	0.0791 *** (0.0304)
Downturn	-0.0042 *** (0.0010)	-0.0025 (0.0023)	0.0053 *** (0.0020)	-0.0522 *** (0.0021)	-0.1208 *** (0.0049)	-0.0602 *** (0.0040)
<b>Own*Downturn</b>	<b>-0.0129</b> (0.0093)	<b>0.0056</b> (0.0124)	<b>-0.0074</b> (0.0112)	<b>0.0826</b> *** (0.0195)	<b>0.0661</b> ** (0.0264)	<b>-0.0114</b> (0.0221)
MES	0.0050 *** (0.0007)	-0.0153 *** (0.0022)	-0.0138 *** (0.0027)	0.0996 *** (0.0014)	0.2219 *** (0.0047)	0.0210 *** (0.0052)
HH Index	-5.4324 *** (0.5876)	-0.2434 (0.3368)	25.7911 *** (1.8257)	41.6005 *** (1.2291)	-3.7666 *** (0.7148)	73.1326 *** (3.6088)
Industry Agglomeration	0.0939 ** (0.0391)	0.8592 ** (0.4239)	0.8278 *** (0.1383)	1.3588 *** (0.0825)	-9.7048 *** (0.9022)	-9.6546 *** (0.2733)
Exports/VAB	0.0423 *** (0.0028)	-0.0067 (0.0058)	0.0246 *** (0.0030)	-0.1543 *** (0.0058)	0.0588 *** (0.0123)	-0.0685 *** (0.0059)
Industry Growth	-0.0001 (0.0017)	0.0020 (0.0073)	0.0017 (0.0131)	0.0253 *** (0.0036)	0.0108 (0.0155)	0.1389 *** (0.0258)
For. Presence in Industry	0.0322 (0.0453)	0.0728 (0.0474)	-0.2739 *** (0.0497)	-1.3086 *** (0.0952)	-1.6213 *** (0.1009)	-1.7549 *** (0.0981)
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	428692	80053	151712	399757	75800	142833
R <sup>2</sup>	0.2806	0.2722	0.2743	0.2484	0.2633	0.2691

\*\*\*, \*\*, \* means significant at 1%, 5% and 10% level, respectively.

## B. Empirical Results – Firms' Hazard Rates by Technological Complexity of PMI

	Low-Tech Manufacturing Industries		Medium-Low Tech Manufacturing Industries		Medium-High/High Tech Manufacturing Industries
Constant	-1.0936 *** (0.0959)		-0.2818 (0.5897)		-6.4570 *** (0.6055)
Age	0.0121 *** (0.0007)		0.0171 *** (0.0018)		0.0113 *** (0.0006)
Age squared	-6.03e-06 *** (3.51e-07)		-8.47e-06 *** (8.90e-07)		-5.57e-06 *** (3.15e-07)
Size	-0.5156 *** (0.0140)		-0.7110 *** (0.0365)		-0.5701 *** (0.0231)
Size squared	0.0423 *** (0.0037)		0.0770 *** (0.0085)		0.0506 *** (0.0061)
Firm Performance	-0.0232 *** (0.0057)		-0.0676 *** (0.0163)		0.0245 ** (0.0120)
Human Capital	0.1849 *** (0.0604)		0.4480 *** (0.1339)		0.3047 *** (0.0822)
Ownership	0.0349 (0.0977)		0.1821 (0.1561)		0.2908 ** (0.1190)
Urban	0.1650 *** (0.0121)		0.0010 (0.0345)		0.2063 *** (0.0212)
Downturn	0.1032 *** (0.0126)		0.2198 *** (0.0321)		0.0736 *** (0.0276)
<b>Own*Downturn</b>	<b>0.1618</b> (0.1519)		<b>-0.2663</b> (0.2596)		<b>-0.1777</b> *** (0.1940)
MES	-0.0428 *** (0.0083)		-0.0521 (0.0323)		0.1870 *** (0.0412)
HH Index	17.2676 ** (8.4980)		4.3666 (6.2929)		-76.0279 *** (22.9364)
Industry Agglomeration	-0.1389 (0.4841)		-0.0082 (7.5542)		18.0945 *** (2.7608)
Exports/VAB	0.2309 *** (0.0351)		-0.1656 * (0.1001)		-0.3502 *** (0.0924)
Industry Growth	0.0517 ** (0.0215)		0.0009 (0.1217)		-0.1344 (0.1775)
For. Presence in Industry	-1.3974 ** (0.5676)		1.8668 *** (0.6770)		1.7676 * (0.9367)
Entry Rate	3.3725 *** (0.4560)		1.0476 (1.2826)		4.4959 *** (1.2069)
Industry dummies	Yes		Yes		Yes
Time dummies	Yes		Yes		Yes
N	239821		38422		84219
$\chi^2$	8447.20		1389.35		2998.10
Log Likelihood	-88385.42		-11817.18		-27950.56

\*\*\*, \*\*, \* means significant at 1%, 5% and 10% level, respectively.



### C. Empirical Results – The effect of firm size on firms’ employment growth

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	-0.8427 *** (0.0104)	-0.8650 *** (0.0106)	0.5771 *** (0.0128)	0.5785 *** (0.0128)	0.5864 *** (0.0139)	0.5794 *** (0.0139)
Age			0.0007 *** (0.0001)	0.0007 *** (0.0001)	0.0002 ** (0.0001)	0.0002 ** (0.0001)
Age <sup>2</sup>			-3.29e-07 *** (3.32e-08)	-3.34e-07 *** (3.32e-08)	-7.29e-08 * (3.83e-08)	-9.45e-08 ** (3.84e-08)
Size	0.5326 *** (0.0019)	0.5456 *** (0.0019)	0.4603 *** (0.0020)	0.4604 *** (0.0020)	0.4594 *** (0.0020)	0.4614 *** (0.0020)
Size <sup>2</sup>	-0.0419 *** (0.0004)	-0.0424 *** (0.0004)	-0.0359 *** (0.0004)	-0.0359 *** (0.0004)	-0.0358 *** (0.0004)	-0.0358 *** (0.0004)
Firm Performance			-0.1310 *** (0.0007)	-0.1308 *** (0.0007)	-0.1334 *** (0.0007)	-0.1333 *** (0.0007)
Human Capital			-0.1379 *** (0.0082)	-0.1360 *** (0.0082)	-0.1483 *** (0.0083)	-0.1469 *** (0.0083)
Ownership		-0.0445 *** (0.0063)	-0.0041 (0.0062)	-0.0043 (0.0062)	-0.0070 (0.0062)	-0.0073 (0.0062)
Urban			0.0030 (0.0076)	0.0029 (0.0076)	0.0050 (0.0076)	0.0049 (0.0076)
Downturn				-0.0045 *** (0.0008)	-0.0045 *** (0.0008)	-0.0067 *** (0.0015)
<b>Size*Downturn</b>						<b>-0.0052 ***</b> (0.0006)
MES					-0.0002 (0.0005)	-0.0001 (0.0005)
HH Index					-1.4665 *** (0.2105)	-1.4978 *** (0.2105)
Industry Agglomeration					0.1768 *** (0.0320)	0.1743 *** (0.0320)
Export Intensity					0.0166 *** (0.0014)	0.0163 *** (0.0014)
Industry Growth					-0.0023 (0.0016)	-0.0023 (0.0016)
Foreign Share					0.0530 ** (0.0228)	0.0525 ** (0.0228)
Industry Dummies	YES	YES	YES	YES	YES	YES
N	719217	693780	660461	660461	660457	660457
R <sup>2</sup>	0.2031	0.2139	0.2752	0.2752	0.2758	0.2759

\*\*\*, \*\*, \* means significant at 1%, 5% and 10% level, respectively.

#### D. Empirical Results – The effect of firm size on firms' turnover growth

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Constant	-0.2020 ***		-0.1989 ***		-5.5369 ***		-5.5278 ***		-7.0909 ***		-7.0912 ***	
	(0.0240)		(0.0245)		(0.0281)		(0.0281)		(0.0296)		(0.0296)	
Age					-0.0228 ***		-0.0227 ***		-0.0086 ***		-0.0086 ***	
					(0.0001)		(0.0001)		(0.0002)		(0.0002)	
Age <sup>2</sup>					1.13e-05 ***		1.13e-05 ***		4.25e-06 ***		4.25e-06 ***	
					(7.07e-08)		(7.07e-08)		(7.93e-08)		(7.94e-08)	
Size	0.1288 ***		0.1304 ***		0.4643 ***		0.4652 ***		0.5016 ***		0.5016 ***	
	(0.0045)		(0.0046)		(0.0043)		(0.0043)		(0.0041)		(0.0042)	
Size <sup>2</sup>	-0.0086 ***		-0.0085 ***		-0.0344 ***		-0.0342 ***		-0.0426 ***		-0.0426 ***	
	(0.0010)		(0.0010)		(0.0009)		(0.0009)		(0.0009)		(0.0009)	
Firm Performance					0.5132 ***		0.5151 ***		0.5872 ***		0.5872 ***	
					(0.0015)		(0.0015)		(0.0015)		(0.0015)	
Human Capital					-0.5270 ***		-0.5105 ***		-0.3042 ***		-0.3041 ***	
					(0.0179)		(0.0179)		(0.0175)		(0.0175)	
Ownership			-0.0837 ***		-0.1733 ***		-0.1757 ***		-0.1337 ***		-0.1337 ***	
			(0.0148)		(0.0133)		(0.0133)		(0.0129)		(0.0129)	
Urban					0.0960 ***		0.0950 ***		0.0434 ***		0.0434 ***	
					(0.0166)		(0.0166)		(0.0161)		(0.0161)	
Downturn							-0.0373 ***		-0.0646 ***		-0.0641 ***	
							(0.0017)		(0.0016)		(0.0031)	
<b>Size*Downturn</b>											<b>-0.0002</b>	
											(0.0012)	
MES									0.1260 ***		0.1260 ***	
									(0.0011)		(0.0011)	
HH Index									7.4546 ***		7.4534 ***	
									(0.4352)		(0.4352)	
Industry Agglomeration									-0.4020 ***		-0.4021 ***	
									(0.0668)		(0.0668)	
Export Intensity									-0.1449 ***		-0.1449 ***	
									(0.0030)		(0.0030)	
Industry Growth									0.0212 ***		0.0212 ***	
									(0.0034)		(0.0034)	
Foreign Share									-1.0320 ***		-1.0320 ***	
									(0.0475)		(0.0475)	
Industry Dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	646448	623746	618394	618394	618394	618394	618394	618390	618390	618390	618390	618390
R <sup>2</sup>	0.0048	0.0050	0.2011	0.2011	0.2019	0.2019	0.2019	0.2472	0.2472	0.2472	0.2472	0.2472

\*\*\*, \*\*, \* means significant at 1%, 5% and 10% level, respectively.

### E. Empirical Results – The effect of firm size on firms' hazard rates

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	-1.1298 *** (0.0163)	-1.1267 *** (0.0163)	-1.2525 *** (0.0517)	-1.3000 *** (0.0519)	-1.1332 *** (0.0747)	-1.1129 *** (0.0749)
Age			0.0117 *** (0.0004)	0.0119 *** (0.0004)	0.0117 *** (0.0004)	0.0117 *** (0.0004)
Age squared			-5.82e-06 *** (2.04e-07)	-5.91e-06 *** (2.02e-07)	-5.83e-06 *** (2.07e-07)	-5.83e-06 *** (2.08e-07)
Size	-0.5768 *** (0.0097)	-0.5812 *** (0.0098)	-0.5523 *** (0.0113)	-0.5524 *** (0.0113)	-0.5479 *** (0.0113)	-0.5619 *** (0.0029)
Size squared	0.0590 *** (0.0026)	0.0591 *** (0.0026)	0.0485 *** (0.0029)	0.0483 *** (0.0029)	0.0486 *** (0.0029)	0.0483 *** (0.0029)
Firm Performance			-0.0074 (0.0048)	-0.0079 * (0.0048)	-0.0180 *** (0.0049)	-0.0182 *** (0.0049)
Human Capital			0.2851 *** (0.0452)	0.2696 *** (0.0452)	0.2546 *** (0.0455)	0.2551 *** (0.0456)
Ownership		0.1207 ** (0.0485)	0.1164 ** (0.0543)	0.1216 ** (0.0543)	0.1284 ** (0.0544)	0.1299 ** (0.0544)
Urban			0.1540 *** (0.0100)	0.1531 *** (0.0100)	0.1572 *** (0.0100)	0.1572 *** (0.0100)
Downturn				0.1477 *** (0.0099)	0.1318 *** (0.0103)	0.0807 *** (0.0159)
<b>Size*Downturn</b>						<b>0.0388 ***</b> (0.0092)
MES					-0.0375 *** (0.0066)	-0.0380 *** (0.0092)
HH Index					4.8112 (3.5584)	4.9031 (3.5581)
Industry Agglomeration					-0.5696 (0.4100)	-0.5396 (0.4102)
Exports/VAB					0.0869 *** (0.0213)	0.0880 *** (0.0213)
Industry Growth					0.0032 (0.0205)	0.0032 (0.0205)
Foreign Presence					-0.5900 * (0.3305)	-0.6063 * (0.3305)
Entry Rate					4.0428 *** (0.3727)	4.0568 *** (0.3725)
Time Dummies	YES	YES	YES	YES	YES	YES
Industry Dummies	YES	YES	YES	YES	YES	YES
N	431218	417786	362463	363463	363462	362462
$\chi^2$	15053.31	14884.14	12402.20	12619.98	12870.46	12888.27
Log Likelihood	-158259	-156457	-128571	-128462	-128337	-128328

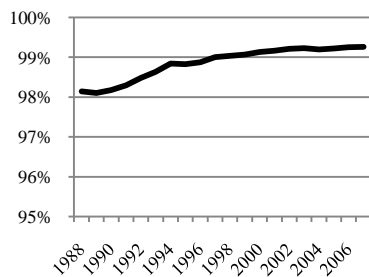
\*\*\*, \*\*, \* means significant at 1%, 5% and 10% level, respectively.

## F. Comparison of samples – Small-Medium Enterprises and Large-Enterprises

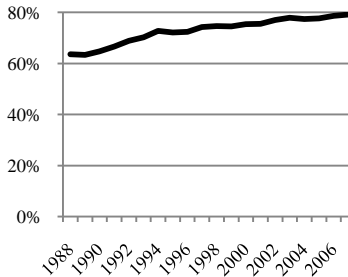
		Mean Values			Correlation Matrix													
		All Firms	SMEs	LEs	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)			
Age	(1)	24.066	19.986	35.637														
Size	(2)	1.957	1.913	6.030	-0,07													
Firm Performance	(3)	9.977	9.968	10.768	0,00	0,07												
Human Capital	(4)	0.019	0.019	0.048	-0,02	0,03	0,19											
Ownership	(5)	0.014	0.012	0.246	-0,11	0,33	0,08	0,03										
Urban	(6)	0.392	0.389	0.462	0,01	0,02	-0,03	0,05	-0,55									
MÊS	(7)	6.708	6.691	8.258	-0,04	0,24	-0,23	-0,05	0,06	-0,03								
HH Índice	(8)	0.001	0.003	1.7e-05	-0,01	0,04	0,05	0,04	-0,50	0,31	0,12							
Industry Agglomeration	(9)	0.056	0.177	0.001	-0,02	0,13	-0,17	-0,05	-0,78	0,40	0,56	0,23						
Exports/VAB	(10)	1.151	1.152	1.109	-0,01	-0,05	0,13	0,05	-0,01	-0,04	-0,12	-0,08	0,48					
Industry Growth	(11)	-0.003	-0.003	0.026	-0,01	0,03	-0,12	-0,02	0,01	0,05	0,13	-0,03	0,09	-0,17				
For. Presence in Industry	(12)	0.107	0.106	0.117	-0,02	-0,01	0,20	0,09	0,01	-0,01	0,12	0,13	0,30	0,66	-0,02			

## G. Relative importance of SMEs in Manufacturing (SMEs as percentage of the total)

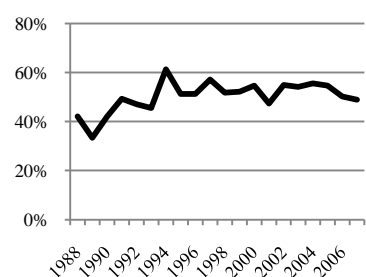
**Number of Firms**



**Employment**



**Sales turnover**



## H. Survival Rates and Hazard Rates of Small-Medium Enterprises and Large Enterprises

Time Interval	SMEs				LEs			
	Nr. firms at risk	Nr. failures	Survival	Hazard	Nr. firms at risk	Nr. failures	Survival	Hazard
[1-2[	86912	16868	<b>0.8059</b>	<b>0.1941</b>	115	22	<b>0.8087</b>	<b>0.1913</b>
[2-3[	66700	9625	<b>0.6898</b>	<b>0.1443</b>	87	6	<b>0.7529</b>	<b>0.0690</b>
[3-4[	54259	7054	<b>0.6000</b>	<b>0.1300</b>	77	4	<b>0.7138</b>	<b>0.0519</b>
[4-5[	44066	5324	<b>0.5275</b>	<b>0.1208</b>	67	4	<b>0.6712</b>	<b>0.0597</b>
[5-6[	35370	3950	<b>0.4686</b>	<b>0.1117</b>	54	3	<b>0.6339</b>	<b>0.0556</b>
[6-7[	27960	2869	<b>0.4205</b>	<b>0.1026</b>	45	3	<b>0.5916</b>	<b>0.0667</b>
[7-8[	23119	2276	<b>0.3791</b>	<b>0.0984</b>	39	1	<b>0.5765</b>	<b>0.0256</b>
[8-9[	19302	1703	<b>0.3456</b>	<b>0.0882</b>	35	1	<b>0.5600</b>	<b>0.0286</b>
[9-10[	16267	1385	<b>0.3161</b>	<b>0.0851</b>	31	2	<b>0.5239</b>	<b>0.0645</b>
[10-11[	13597	1123	<b>0.2901</b>	<b>0.0826</b>	24	2	<b>0.4802</b>	<b>0.0833</b>
[11-12[	11416	929	<b>0.2665</b>	<b>0.0814</b>	20	0	<b>0.4802</b>	<b>0.0000</b>
[12-13[	9215	787	<b>0.2437</b>	<b>0.0854</b>	19	0	<b>0.4802</b>	<b>0.0000</b>
[13-14[	6944	547	<b>0.2245</b>	<b>0.0788</b>	12	0	<b>0.4802</b>	<b>0.0000</b>
[14-15[	5504	446	<b>0.2063</b>	<b>0.0810</b>	9	1	<b>0.4269</b>	<b>0.1111</b>
[15-16[	4205	303	<b>0.1915</b>	<b>0.0721</b>	7	0	<b>0.4269</b>	<b>0.0000</b>
[16-17[	2955	181	<b>0.1797</b>	<b>0.0613</b>	4	0	<b>0.4269</b>	<b>0.0000</b>
[17-18[	1920	150	<b>0.1657</b>	<b>0.0781</b>	3	0	<b>0.4269</b>	<b>0.0000</b>
[18-19[	858	53	<b>0.1555</b>	<b>0.0618</b>	1	0	<b>0.4269</b>	<b>0.0000</b>