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FIRM EXIT DURING ECONOMIC SLOWDOWNS: DOES FOREIGN OWNERSHIP
MATTER?

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Abstract

Do multinationals' activities contribute to the severity of global economic crisis by quickly closing down facilities or otherwise allow to mitigating some of the worst effects, by remaining rooted in the local economy and thus reducing lay-offs and output contraction in the host countries?

The present paper provides an empirical analysis on the link between foreign ownership and firm survival over an almost 20-year period and during two economic downturns in particular, using an extensive firm-level database and applying hazard models. We analyse the determinants of exit of firms and investigate whether there are significant differences in the hazard rates of foreign and domestic firms when controlling for firm and industry specificities. Additionally we assess whether the foreignness effect alters during economic downturns and whether any spillovers arise from the multinationals' presence in the industry.

After controlling for several firm and industry specific characteristics, we find that foreign firms exhibit higher failure rates over the time period as a whole. However, during economic slowdowns domestic and foreign firms do not exhibit different chances of survival and exit. Finally, regarding potential spillovers, our results suggest that foreign presence may impact positively upon local firms' survival.

Keywords: survival; hazard; foreign ownership; economic crisis; manufacturing; Portugal

JEL Codes: D21, F23, L25, L60

FIRM EXIT DURING ECONOMIC SLOWDOWNS: DOES FOREIGN OWNERSHIP MATTER?

1. INTRODUCTION*

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 multinationals in host economies. Do multinationals' activities contribute to the severity of global economic crisis by quickly closing down facilities or, otherwise, are they able to be part of the solution to the problems raised by the crisis, by remaining rooted in the local economy and thus reducing lay-offs and output contraction in the host countries?

There is substantial work on the behaviour, evolution and role of foreign firms in host economies. Although important for explaining the firm demography and employment, the link between foreign presence and firms' failure rates in host economies has been largely neglected, especially under a crisis context. This paper provides a first comparison between the survival and hazard patterns of foreign and domestic firms over a long time period and during economic slowdowns using hazard models. A stream of research that focused on the survival of foreign firms in host economies reveals their high failure rates (e.g. Li, 1995; Delios and Beamish, 2001; Dhanaraj and Beamish, 2004; Chung and Beamish, 2005a, 2005b). However, the few studies that compared how foreign firms perform in comparison to domestic firms obtained ambiguous results (cf. Bernard and Sjöholm, 2003; Kronborg and Thomsen, 2009). Moreover, we know even less about these patterns in face of economic slowdowns (Álvarez and Görg, 2009; Lee and Makhija, 2009).

In this study, we examine the link between multinational enterprises and firm failure in Portuguese manufacturing industry over an almost 20-year period and during economic slowdowns in particular. We address two main questions: first, do foreign MNEs' affiliates have higher failure rates than domestic firms? And second, does the foreignness effect change during economic downturns? Doing so, we also reveal and explore other firm and industry characteristics that may be determinants of firm survival.

We analyze domestic and foreign firms created in Portugal in the period 1988-2005 by following their paths during the whole period and the economic slowdowns of early 1990s

and 2000s. The study is based on firm-level data from *Quadros de Pessoal* database and uses duration models to address the aforementioned research questions.

The paper is structured as follows. Section 2 reviews the most relevant literature on the foreign ownership - firm survival relationship, highlighting as well other firm-level determinants which are likely to affect the exit rates. Section 3 relates to methodological issues, where the data and econometric procedures are outlined. Section 4 presents some descriptive statistics and discusses the results. Section 5 concludes.

2. FOREIGN OWNERSHIP, FIRM SURVIVAL AND EXIT

MNEs are said to possess firm-specific advantages which make them able to surpass the *liability of foreignness* (Zaheer, 1995) and to outperform their domestic counterparts in the host economy (Caves, 1996; Dunning and Lundan, 2008; Hymer, 1976). They may be in better position to compete, and, therefore, they may have longer survival, lower exit rates and higher longevity than domestic firms. The empirical results on this matter are not however unanimous.

From the seminal study of Li and Guisinger (1991) several studies have found MNEs to exhibit higher survival rates than domestic firms. 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.

Another set of studies have showed that firms with foreign capital participation bear higher risk of exit. 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, 2003a) or the extensive use by MNEs of the margin available to close plants more often than their domestic equivalents (Bernard and Sjöholm, 2003). Other authors highlight the *liability of foreignness*. Foreign investments may represent high financial and managerial burdens, for example due to the higher tariffs and other taxes that foreign firms must pay (Pérez et al., 2004).

Finally, a third group of studies found no significant differences between foreign-owned and domestic-owned companies in what concerns their survival and/or exit risks. In fact, foreign and domestic enterprises may respond in similar fashions to the survival determinants and thus display identical patterns of exit when accounting for differences in various characteristics of the firm (size, human capital, legal structure, among others) and industry (Kimura and Fujii, 2003, Kimura and Kiyota, 2007, Özler and Taymaz, 2004, Taymaz and Özler, 2007).

From the above we realize that there is no consensus on the effect of foreign ownership *per se* on firm survival. Moreover, it remains also overlooked whether under a crisis' environment MNEs are affected or react differently from domestic firms, and, if that is the case, if their advantages compensate for the disadvantages of doing business abroad (or not) and also make them weather the crisis in a better way (or not).

In the scarce literature that exists we find arguments for a stabilizer or otherwise role of MNEs during crisis. The empirical studies from Blalock et al. (2005), Narjoko and Hill (2007), Chung and Beamish (2005a, 2005b) and Chung et al. (2008) found that being a foreign-owned firm was crucial to succeed in the Asian financial crisis and post-crisis stage. Foreign subsidiaries in MNE networks survive longer in a crisis maybe owing to their higher independence from local markets, better access to resources and the advantages arising from such linkages (e.g. internal capital markets), which provide them greater ability to adapt themselves to the new context (Blalock et al., 2005; Chung and Beamish, 2005a, 2005b; Desai et al., 2004).

Other studies on the link between foreign ownership and firm survival under a crisis context have revealed that foreign firms' reactions may contribute to further instability, to accelerate job losses and the decline in business activities, making more difficult the subsequent recovery process (Álvarez and Görg, 2009; Görg and Strobl, 2003a;). It may be easier for them to transfer production facilities internationally, to readjust their optimal portfolio and, in the limit, to exit the local economy (Flamm, 1984; Lee and Makhija, 2009; Gao and Eshaghoff, 2004) when there are negative changes in the economy.

Based on the scant empirical evidence on these matters, we expect foreign ownership to matter for firm's survival in general and also under a crisis period. However, there is no consensus regarding the direction of the effect. There are also other firm and industry characteristics which are likely to affect the survival of firms. In our analysis we must

properly account for them, in order to investigate if there remain any significant differences in exit that can be attributed to foreignness *per se*.

Firm size is one of the most debated factors in the survival literature and several studies have found that firm size influences positively the probability of survival (Audretsch and Mahmood, 1995; Mata and Portugal, 1994; Agarwal, 1997) and foreign firms are generally found to be larger than domestic plants. Compared to small firms, large firms have more probability of being operating at a minimum efficient scale and may also have better access to capital or labor markets which in turn improve their chances of survival (Pérez et al., 2010). However, the effect may be non-linear (e.g., Disney et al., 2003).

Firm age has been generally acknowledged as one important factor determining survival prospects (Geroski, 1995). With age firms go through a process of learning about efficiency and market competitiveness so that less efficient firms exit the market whereas surviving firms accumulate experience and information reducing the risk of exit (Stinchcombe, 1965; Jovanovic, 1982; Ericson and Pakes, 1995). However, several studies have found a different, non-linear, link between exit risk and firm age (e.g., Fichman and Levinthal, 1991; Audretsch and Mahmood, 1995; Strotmann, 2007; Pérez et al, 2010) .

Firm performance is considered in the literature as an important factor in survival expectancies, and foreign firms are generally found to be more productive than domestic plants (Bernard and Sjöholm, 2003; Görg and Strobl, 2003a). Several studies have been showing that poor performance is strongly associated with higher failure rates (Altman, 1968; Köke, 2002; Heiss and Köke, 2004).

Human capital stocks may also be a factor associated with firm's competitive advantage and thus with its survival prospects, acting as a specific-asset that can constitute an ownership advantage for firms, since knowledge assets are hard to imitate, by their complex and tacit nature, and also difficult to trade. Foreign firms in general operate in industries with higher human capital intensity (e.g., Mata and Portugal, 2004). However, empirical evidence on the relationship between firm survival and human capital is scarce (Bates, 1990; Teixeira and Vieira, 2005; Acs and Armington, 2009).

Firm location and industry specificities are also thought to matter for survival and exit, so that we must control for these aspects. Geographic location of firms may matter for their survival prospects. *Large urban locations* often contain a wealth of diverse resources but firms at these

locations may also have to face greater competition and higher costs related to diseconomies of agglomeration.

We consider several industry specificities likely to influence survival. Minimum efficient scale, market concentration, industry growth, entry rates, 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.

3. DATA AND METHODOLOGICAL ISSUES

3.1. Data Source and Computation of Duration Data

The data used in this study were obtained from *Quadros de Pessoal* (hereafter QP), a database from GEP of the Ministry of Labour and Social Solidarity based on a compulsory annual survey covering all firms with wage earners in Portugal, conducted since 1982. Owing to the longitudinal dimension of QP database, we were able to follow individual firms over time. By working directly with raw files (from 1985 to 2007), it was possible to compute entry and exit measures by ourselves. The survival analysis will be conducted for the period 1988-2005. 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. The years 2006 and 2007 were only used as a control for the identification of exits. Similar methods were applied in the studies of Mata and Portugal (1999, 2001, 2004) and Geroski et al. (2010). Accordingly, we focus on 1988 cohort and firms born thereafter, 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 corresponding to 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). 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 models will pay particular attention to this fact.

3.2. Statistical Model

For analyzing in detail the time pattern of firms' exit, we rely on econometric models belonging to a class of models known as duration models. 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. Because of this censoring, in our analysis we need to employ a statistical model able of accommodating such incomplete durations.

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, properly accommodated in time duration models (Singer and Willett, 1993). We thus proceed by dividing the time axis into 18 intervals, corresponding to our 18 measured durations, and defining the hazard rate $h(t)$ for the t^{th} interval as the probability of exiting during the t^{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, 2001), we employ a 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. We apply a piecewise constant hazard model. The hazard function in interval t is defined as:

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

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:

$$h(t | X_{t-1}) = e^{\lambda t} e^{(\beta X_{t-1})}, \quad t = 1, \dots, T \quad (2)$$

where β denotes the vector of regression coefficients measuring the impact of a set of explanatory variables included in vector X (namely firm-level and industry-level characteristics, in addition to the macroeconomic control, described in detail in the Appendix). 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, with the model being estimated by maximum likelihood methods:

$$\log h(t | X_{t-1}) = \lambda_t + \beta X_{t-1}, \quad t = 1, \dots, T \quad (3)$$

4. EMPIRICAL RESULTS

4.1. Univariate Analysis and Descriptive Statistics

Survival and Hazard Rates

After applying the procedures previously explained, 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 in 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 1. Hazard rates and cumulative failure rates (corresponding to $1-S(t)$) are reported as well.

*** Insert Table 1 about here ***

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.

Kaplan-Meier survivor function allows the comparison of the estimated survivor functions for different categories of firms. In Figure 1, firms are stratified according to a foreign ownership dummy ($Own = 1$ if the firm is foreign-owned, 0 otherwise). These first results suggest that, unconditionally, foreign-owned firms survive longer than their domestic counterparts (FF and DF respectively, hereafter).

*** *Insert Figure 1 about here* ***

Covariates

Table 2 provides a brief comparison between FF and DF, by presenting the mean values of the independent variables included in our estimations (see Appendix for further details on these variables). At firm-level, differences in size, operational performance (except for 1989 and 1994) and human capital were always significant at 1% level (t-test) and confirmed the differences regarding the industries entered.

*** *Insert Table 2 about here* ***

In the next section, we carry out a multivariate analysis, by estimating a discrete time hazard model controlling for firms' and industry's specificities and searching for a potential different behavior between foreign and domestic firms during economic slowdowns.

4.2. Econometric Analysis

We control for heterogeneity among firms by including in our estimations those firm-level and industry-level variables described above and that are expected to affect firm exit and moderate the ownership effect upon firm dynamics. Among those, a dummy variable - *Ownership* - allows 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 an interaction term - $Own * Downturn$. We expect economic downturns to affect survival, but we do not know if the effect is generalized (Bhattacharjee et al., 2009) or if (and

how much) it differs accordingly to firm specificities. Over the time period under scrutiny, it was possible to identify two downturn periods in the Portuguese economy: the early 1990s (1991-1993) and 2000s (2001-2003), which were characterized by declines in GDP, in private consumption and investment (Bank of Portugal, 2009) and a raise in unemployment.

Table 3 reports our results.

*** *Insert Table 3 about here* ***

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.

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 (e.g. Acs and Armington, 2009) also for Portugal using QP database (Teixeira and Vieira, 2004). This pattern may be due to the high wage levels that these workers demand, turning firms unprofitable. This is a result that needs further exploration.

Accordingly with our results, even when accounting for firm and industry specificities, foreignness does matter in what concerns probability of exit. FF are found to have about 13% higher hazards than DF.

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 the share of foreign presence is negative and significant indicating that there are positive spillover effects from operating in an industry with strong presence of foreign firms.

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 lower survival prospects of the firms.

5. CONCLUSION

This paper examines the link between multinational enterprises and firm failure in Portuguese manufacturing industry over an 18-year period and during economic slowdowns in particular. We investigated if foreign MNEs' affiliates have higher failure rates than domestic firms if the foreignness effect alters during economic downturns.

We analyzed the survival patterns of foreign and domestic firms during the period 1988-2005 and observed that, unconditionally, foreign firms survive longer than their domestic counterparts. However as the two groups differ significantly in a number of aspects themselves important for survival, we have to account for them. After controlling for firm and industry specificities, foreignness increases firms' probability of exit. Foreign-owned firms were found to be about 13% more prone to exit than domestic firms with similar observable characteristics.

Conversely, during economic recessions both groups of firms were severely affected, suffering higher risks of failure. That is, during periods of economic slowdown 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 catalyst to firm death, being domestic firms relatively more affected when compared to a normal situation (their hazard rates increases significantly reducing the difference to foreign-owned firms).

The results suggest that managers should not rely on the observable advantages of foreign firms (size, human capital and performance) because their failure risk is high in general. Care is also required when deriving strong implications from our study. This is the first study to systematically compare the patterns of exit by foreign and domestic firms during such a long-time period. Further studies are needed also in other economies. Nonetheless, a careful investigation of the causes behind the observed differences seems to be in order for a deepening of our understanding on the prospects of survival in international markets.

For the policy-maker concerned with FDI, our results on survival dynamics are not supportive of a discriminatory policy in favor of foreign firms. Also, during crisis, if, in the one hand, there is no need to fear that foreign firms destabilize more than usual the host economy by

immediately closing down operations, on the other hand there is no reason to expect positive gains from FDI in what concerns their potential recovery-enhancer role.

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APPENDIX

Variable Definitions

VARIABLES		DESCRIPTION
<i>Main Variables of Interest</i>	Ownership	Dummy = 1 if, at least, 50% of the capital is held by foreign investors, 0 otherwise
	Own*Downturn	Interaction variable measuring the effect of being a FF during downturns
<i>Firm-Level</i>	Age ¹	Number of years since the entry of the firm ¹
	Age squared	Squared number of years since the entry of the firm
	Size	Ln (number of employees)
	Size squared	Squared value of Ln (number of employees)
	Firm Performance	Operational Performance measured through the log of the ratio Turnover/Employment
	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
<i>Industry-Level</i>	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
	Foreign Share	Share of FF's employment in total 2-digit industry's employment
	Export Intensity ²	Ratio 2-digit industry Exports/2-digit industry VAB
	Industry Growth	$\ln(2\text{-digit industry Employment}_t) - \ln(2\text{-digit industry Employment}_{t-1})$
	Entry Rate	Ratio (Entrants' employment in year t/2-digit industry total employment in year t)
	Industry Dummies	Dummy = 1 for each 2-digit industry where the firm operates, 0 otherwise
<i>Macro-Level</i>	Downturn	Dummy = 1 for the years 1991, 1992, 1993, 2001, 2002, 2003 and 0 otherwise

¹ No data for the foundation year was available before 1994. As a result, for the computation of Firm Age, we proxied the foundation year through the year of admission of the former worker for each firm.

² Data at 2-digit industry level (ISIC rev. 2) on exports and on Gross Value Added is from the National Institute of Statistics and the Bank of Portugal, respectively.

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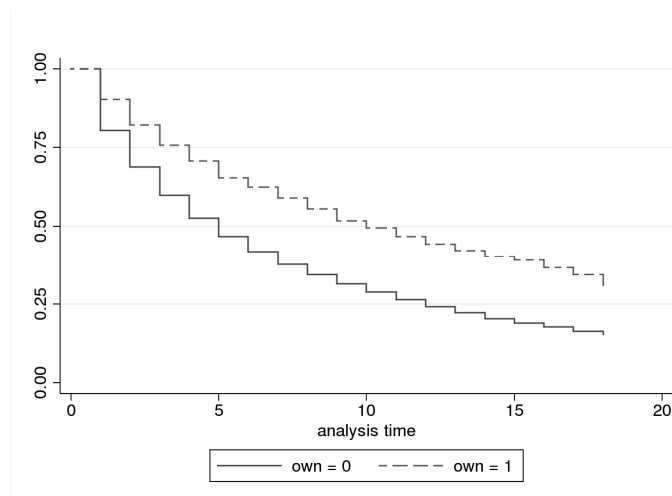
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FIGURES

Figure 1. Kaplan-Meier estimates of survivor functions by foreign ownership



TABLES

Table 1. Survival Rates and Hazard Rates (selective time intervals)

Time Interval	Nr. firms at risk	Nr. failures	Net Lost*	Survival	Std. Error	Hazard	Std. Error	Cumulative Failure
[1-2[	87027	16890	3350	0.8059	0.0013	0.1941	0.0015	0.1941
[..[...
[5-6[	35424	3953	3466	0.4688	0.0018	0.1116	0.0018	0.5312
[..[...
[18-19[	859	53	806	0.1557	0.0025	0.0617	0.0085	0.8443

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

Table 2. Comparison of samples of FF and DF

	All Firms	
	DF	FF
Age	21.025	33.755
Size	1.929	3.967
Firm Performance	9.961	11.032
Human Capital	0.018	0.098
Urban	0.389	0.511
MES	6.696	7.308
HH Index	0.003	0.004
Industry Agglomeration	0.177	0.181
Exports/VAB	1.151	1.325
Industry Growth	-0.003	-0.014
For. Presence in Industry	0.106	0.146

Table 3. Estimation results

	Variable	B	s.d.	Sig.
	Constant	-1.1332	(0.0747)	***
Firm level characteristics	Age	0.0117	(0.0004)	***
	Age squared	-5.83e-06	(2.07e-07)	***
	Size	-0.5479	(0.0113)	***
	Size squared	0.0486	(0.0029)	***
	Firm Performance	-0.0180	(0.0049)	***
	Human Capital	0.2546	(0.0455)	***
	Ownership	0.1276	(0.0675)	*
	Urban	0.1572	(0.0100)	***
Industry level characteristics	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		
Macro level	Time dummies	Yes		
	Downturn	0.1317	(0.0103)	***
Interaction	Own*Downturn	0.0021	(0.1083)	
	N		362462	
	χ^2		12870.46	
	Log Likelihood		-128337.03	

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

Additionally, we estimated model 5 separately for manufacturing industries according to different levels of technological complexity. For Low-Technology and Medium-Low Technology manufacturing industries, no difference was found between FF's and DF's exit during economic slowdowns. Only for Medium-High/High-Technology industries FF were found to survive longer during crisis, presenting 16% lower exit rates than DF. 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. 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 from the authors.