

Georgopoulos, Antonios; Nowak-Lehmann D., Felicitas; Sogiakas, Vasilios

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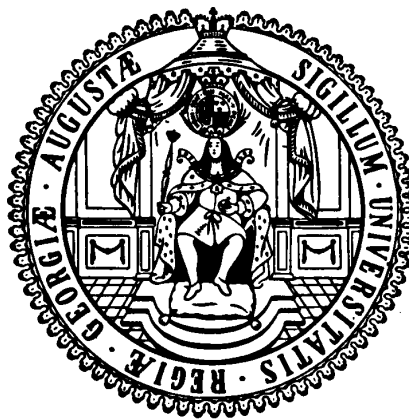
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**Survival Characteristics and Adjustment of MNE
Affiliates in the European Integrated Market**

**Antonios Georgopoulos, Felicitas Nowak-Lehmann D.,
Vasilios Sogiakas**

February 2013

**SURVIVAL CHARACTERISTICS AND ADJUSTMENT OF MNE
AFFILIATES IN THE EUROPEAN INTEGRATED MARKET**

Antonios Georgopoulos

Department of Business Administration, University of Patras (Greece)

Felicitas Nowak-Lehmann D.

Ibero-Amerika Institute for Economic Research and Center for European,
Governance, and Economic Development Research, University of Göttingen
(Germany)

Vasilios Sogiakas

Adam Smith Business School (Economics), University of Glasgow (UK)

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Abstract

This is one of the first studies which systematically investigate whether specific characteristics of foreign affiliates that reflect their MNE investment motivations prolong or undermine affiliate survivorship when the host country becomes member of a regional economic union. Using a unique database of 162 foreign affiliates established in the era of protectionism (1960-1980) in Greece, we explore the survival evolution of these affiliates within the European integration period (1981-2011). The study poses two research objectives: the exploration of the key characteristics per type of affiliate and the analysis of the impact of the specific characteristics on affiliate survival. We hypothesize and find that when the protected Greek economy enters the European market, closure risk is relatively high for those affiliates which exploit traditional location advantages such as tariffs and unskilled-labor cost, whereas it is relatively low for those units that adjust to the new institutional framework by investing in advertising and human capital intensity. The results have important implications for policy makers and managers.

Key Words: Survival of MNE affiliates; Protectionism; Economic Integration; Greece

JEL Classification: F15, F23, C25

1. Introduction

Nowadays MNEs play an important role in regional and global markets. Therefore, it is important to investigate the survival factors of MNE affiliates in a local market¹. Even though foreign survival literature is now well developed, surprisingly little empirical attention has been given to the foreign survival in a dynamic and changing external context². In other words, it has not been extensively examined how existing affiliates react to a new institutional framework that differs from that of their earlier post entry stages, and how their main characteristics affect their survivorship in the new landscape. To the best of our knowledge, only few studies focus on survival under economic crisis conditions exploring either explicitly foreign survival (Chung and Beamish 2005), or comparatively in relation to domestic (Alvarez and Görg 2005; Godart et al. 2011). In turn, other studies (Belderbos 2003) examine MNE closure decisions triggered by the removal of protectionist measures, or compare the evolution of foreign and domestic survivorship in terms of increasing globalization (Kronborg and Thomsen 2009).

Our study attempts to fill this research gap. In order to do this, we overcome the static approach of typical FDI literature, where the outcome of a foreign survival results from a comparative analysis between the benefits of foreignness (Hymer, 1960)³ and costs (liability) of foreignness (LOF) (Zaheer, 1995). Instead, we propose that both foreign affiliates and their local context evolve dynamically over time so that survival risk depends also on the changing external conditions of the local market. An important external change could occur when a country moves from a protectionist regime to more openness and integration. In this case, MNEs normally incur altering

¹ We explicitly focus throughout the paper on the question ‘survival or closure?’ excluding liquidation, bankruptcy, mergers, and acquisitions or other forms of business change.

² A large part of the survival literature has investigated the role of firm-specific characteristics and strategies in survival emphasizing *inter alia* local market experience, type of foreign ownership and mode of market entry (e.g., Mitchell et al. 1994; Li 1995; Shaver et al. 1997, Hennart et al. 1998; Shaver 1998; Mata and Portugal 2000; Delios and Beamish 2001; Dhanaraj and Beamish 2004).

³ Hymer (1960) first of all, argues that parent companies of MNEs possess firm-specific advantages such as proprietary intangible assets (brands, differentiated products, patents, etc.) which are strong enough to cover ‘the costs of doing business abroad’ caused by specific transaction and information costs that arise from the initial lack of understanding the local culture (see also Caves 1971; Caves 1996; Dunning 2000).

trade costs, factor costs, and market potential (Baggs 2005; Baldwin and Yan 2011). Hence they restructure their activities at the regional level with crucial survival effects for MNE affiliates at the local level (Pearce and Papanastasiou 1997; Morgan and Wakelin 1999; Benito et. al. 2003; Montout and Zitouna 2005; Feils and Manzur 2008). It should be mentioned that our interest is not in the integration process *per se*, but in what the specific change implies for local conditions of production.

But which are exactly the changing external conditions and how do they influence foreign survival? The response to this question depends on the kind of location advantages that foreign affiliates exploit. A possible scenario is that in emerging economies MNE may create affiliates in order to take advantage of different factor endowments and exploit unskilled-labor (Culem 1988; Brainard 1997). Nevertheless, integration and regional specialization in more advanced activities make labor-intensive production gradually unattractive so that the hazard rate of corresponding labor- (resource-) seeking affiliates rises substantially. Another realistic scenario is that in a protected, emerging economy in which tariffs are *de facto* high, MNEs may prefer foreign production to exporting to the target country (e.g., Culem 1988; Grubert and Mutti 1991; Morgan and Wakelin 1999). In turn, in an integrated area a removal of tariffs diminishes the tariff-jumping incentive of MNEs to operate more than a few affiliates in the union market, thereby increasing the survival risk of tariff-jumping units.

But, this is not the whole story. Instead of closure, MNEs may have also the alternative strategy to upgrade these non-competitive affiliates in order to adjust to the new ‘rules of the game’ and survive in a specific market. In this case tariff-jumping affiliates can be transformed into new market-seeking units. We could outline their survival outcome using the cost – benefit analysis derived from the proximity-concentration trade-off (Brainard 1997) between economies of scale (export) and proximity advantages to local customers (foreign production). Thus, we could conclude that MNEs will decide to maintain foreign production sites in the local market when the benefits of maintaining capacity in terms of proximity advantages outweigh the trade costs (tariffs and transport costs) of serving the market by exporting and *vice versa* (see Krugman 1991; Brainard 1997; Markusen and Venables 1998; Helpman et al. 2004).

Our paper addresses the survival features of foreign manufacturing affiliates in Greece, a small country which maybe suffers from “the costs of being peripheral”⁴, given that MNEs do not regard all locations as being equivalent. Indeed, the growth of FDI in the total post-war period in Greece has followed a reverse U-curve, which probably implies an increasing survival risk during the integration period. In this country three types of affiliates have been basically created by MNEs; tariff-jumping affiliates -TJ- for the avoidance of protection measures, new market-seeking affiliates -NMS- for the effective supply of the local market via proximity to customers, and resource-seeking affiliates-RS- for the exploitation of cheap resources such as low labor costs.⁵ Our strategic variables correspond to the three basic MNE investment motives, that is, tariffs, market intensity (advertising intensity), and unskilled labor cost. Based on a unique database, we systematically examine the survivorship of 162 MNE affiliates during European integration (1981-2011). For robustness reasons we separately consider the survival phenomenon in the three integration stages which concern the creation of the single market (1981-1991), the Maastricht agreement (1992-2001), and the establishment of the Eurozone (2002-2011). For the purposes of our analysis we use data from all affiliates that were established in the era of protectionism (1960-1980).⁶ The specific methodology guarantees their direct comparability since it enables us to examine how the affiliates which survived in previous environment perform within the single market. In this framework, our analysis highlights the way and the intensity of the impact that affiliate characteristics have on survival risk.

⁴ Those costs mainly face smaller economies, less-developed economies or countries which are spatially or economically in the periphery due to their limited qualitative location advantages (Benito and Narula, 2007).

⁵ In this framework, we elaborate and extend Dunning’s concept (2000) on affiliate types splitting the market seeking units into two categories, i.e., tariff-jumping and new market seeking. It is worth noting that in Greece the market-seeking type is dominant, either in form of tariff-jumping in the period of protection (old market-seeking), or as new market –seeking type in the integration era.

⁶ The vast majority of foreign MNEs has been established in Greece during the protectionist period of the post-war era. Later, especially from the end of the 1990’s some cross-border acquisitions were realized in the national economy (strategic-asset seeking investments in sense of Dunning 2000). However, such investments could not be directly compared with our sample affiliates, because they took place mostly in the second stage of integration where tariffs, labor cost and other parameters of the old environment had lost their attractiveness as investment motives. Thus, these acquired affiliates were second-time FDI just before Greece became member of the Eurozone.

2. Theoretical approach and hypothesis development

2.1. Foreign survival and the liability of localness

We start from the notion that liberalization and integration have not reduced the importance of local factors. Scale economies are no longer expected to rapidly lead to regional and global homogenization. Thus, local environments which vary in particular with institutional frameworks, market potential, and resource endowments (Ghemawat 2007; Meyer et al. 2011), will continue to determine affiliate expansion and survivorship. As local contexts do not remain constant, their benefits and risks for companies vary over time.

From this point of view the first question is what causes changes in a national market. We consider that local transformation may arise *inter alia* from institutional change caused by moving from protectionism to liberalization and integration, technological breakthroughs etc. and has occurred since the 1990s, especially in emerging and other economies with a protected national market (see also Benito et al. 2003; Perez-Batres and Eden 2008).

The next question is how moving from protectionism to economic integration affects local conditions. To answer this question, we adopt the concept of LOL (liability of localness) and look at the costs and benefits of producing locally. This specific concept was introduced by Perez-Batres and Eden (2008). In order to make this concept clear, we distinguish LOL (liability of localness) from LOF (liability of foreignness), the costs and benefits of producing abroad and exporting. While LOF arises from the differences when comparing ‘here’ (domestic market) with ‘there’ (foreign markets), LOL comes from the differences when comparing quite different external contexts within the same country over time (‘then’ with ‘now’). From a punctuated equilibrium model (Haveman et al. 2001), Perez-Batres and Eden (2008) elaborate that LOL results from external shocks and environmental discontinuities which drastically transform the external conditions of local business (Hitt et al. 1998; Neuman, 2000; Haveman et al. 2001). Specifically, such disruptions that are likely to produce radical change could adversely affect domestic firms since they will be unfamiliar with the new ‘rules of the game’ (see also Peng, 2000), and their inefficiencies would be covered by the old, protected environment (Hitt et al. 1998).

We extend Perez-Batres and Eden's study in two important ways. Firstly, we propose that local transformation would also *de facto* increase the closure risk of MNE affiliates. This is because foreign affiliates are in many cases deeply embedded in specific locations.⁷ They often create, develop, and maintain linkages and networks within the same local framework. Such linkages/ networks include among others suppliers, customers, banking institutions, public research institutes, universities, and government. So, they are 'sticky' in the sense that they are locationally immobile reflecting the co-evolution of them and local business and institutional system (Meyer et al. 2011). Thus MNE affiliates directly depend on the local economic evolution and thus become as sensitive to change in location advantages as their domestic counterparts.

Secondly, we consider that the costs and benefits of producing locally must not only be a product of sudden radical changes (see also Jiang and Stening, 2013), but also the outcome of a gradual external transformation,⁸ which can be designed and implemented by economic and political policy makers. Concentrating in regional integration, this is best illustrated by the case of Europe, which has been in the throes of integration for over half a century. Benito et al (2003) suggest that European member countries are not able to 'jump' from non-integration to deep integration automatically. Thus, unlike crisis effects that occur unexpectedly, integration normally takes place gradually. In particular, the European integration process started with shallow integration schemes (e.g., reduction of tariff barriers between member countries), then it proceeded into deeper forms (e.g., common industrial and monetary policy) and eventually reached the stage of the EMU (implementation of the Eurozone), with perspectives of further development. Hence, when integration gradually emerges, MNEs have the time needed to adapt to the new competitive landscape developing innovative survival strategies.

The final question concerns the dynamic effects of local institutional change in the survival characteristics of foreign affiliates. It is expected that at the early integration stage of an protected economy, growth and survival of affiliates are strongly related to

⁷ This is particularly true in the case of market-seeking affiliates, which constitute a very large part of our sample.

⁸ Aulakh and Kotabe (2011) argue that the general approach of gradualist reforms and transformation is seen in the liberalization model followed by China. Spicer et al. (2000), in the case of privatization in Central Europe, suggest that entrepreneurship is well fostered through gradualist policies.

the exploitation of ‘generic’ location advantages such as tariffs, and low wages in terms of tariff-jumping or resource-seeking investment (see Narula and Dunning 2000; Dunning, 2000). Local transformation through integration makes these advantages obsolete. Consequently, as time goes on, and the host country moves to higher development and integration stages, affiliates can substantially decrease survival risk and strengthen their competitiveness in the open landscape through location-bound ‘created’ assets such as high advertising intensities, brand names etc. that are strongly related to new market-seeking FDI (Dunning, 2000; Pennings and Sleuwaegen 2000; Anand and Delios 2002; Chen and Zeng 2004).

2.2. Foreign survival and the proximity concentration trade-off: benefit of localness vs. liability of localness

Generally speaking, integration has significant survival implications especially for local market-seeking affiliates due to the changing patterns of export trade and local production of MNEs. New trade theory (e.g., Brainhard 1997; Markusen and Venables 1998; Markusen 2002) associated with new geography theory (Krugman 1991) and others builds on Dixit-Stiglitz imperfect competition and satisfactorily explains the changing patterns of export trade and foreign production. Thus, in an integrated market, MNEs do not necessarily need to maintain manufacturing affiliates in all national locations any more (i.e., multi-plant firms; see Markusen and Venables 1998) thereby lowering the burden of fixed costs. That way, they replace a multi-domestic strategy applied in the protectionist era by a regional production strategy (Pearce and Papanastasiou 1997) leading to concentration of production sites in core locations that serve other national markets via export trade. At the same time, rationalization does not *a priori* lead to massive closures in local markets. A central element of the new trade theory is the proximity-concentration hypothesis (Brainard 1997; Markusen and Venables 1998; Helpman et al. 2004) which expresses this phenomenon as a trade-off between achieving proximity to customers and concentrating production to achieve economies of scale. Proximity to customers favors localization of foreign production and strengthens survivorship, while economies of scale undermine local production and increase hazard. More precisely, benefits of localness are based on strong market proximity advantages, whereas liability of localness is produced by very low trade

costs and barriers and clear homogenization tendencies of national demand structures due to an intensified integration process. Thus, when the costs of localness outweigh the benefits of localness in a specific location, MNEs will shut down their manufacturing affiliates and replace them via export trade units. Reversely, when the benefits of localness outperform the costs of localness, horizontal market-seeking investment will dominate at the detriment of export. Thus, at a more dynamic level, the consequent exploitation of the changing production conditions by MNEs leads to an array of new concentration and de-concentration moves of manufacturing affiliates with substantial space effects (Krugman 1991) and changing survival characteristics. Inevitably, this process may have crucial implications for national locations and specific types of affiliates.

Next, we deal with the question what kind of competencies foreign affiliates are able to locally develop in order to decrease hazard rate.

2.3. Survival and competencies of affiliates

The development of specific competencies by affiliates is shaped by conditions in the affiliate's local environment and by the affiliate's relationship with other capital-related units (Frost et al. 2002). Corresponding literature (see Birkinshaw et al. 1998; Rugman and Verbecke 2001; Frost et al. 2002; Meyer et al. 2011) suggests that affiliates can form new competences in diverse ways, and thus they are becoming heterogeneous. Taking into account the perspective of affiliate heterogeneity, we can conclude that the competitiveness of MNEs primarily depends a) either on developing competences at the various units to sustain local survivorship and/ or b) transferring competences among the affiliates to guarantee global survival. The former is a traditional model that views affiliates as 'market access' providers and/ or as recipients of the parent company's technology transfers. Such affiliates may integrate technical MNE knowledge with local marketing know-how to implement a market-seeking strategy. Thus, affiliates can embody a set of specific capabilities which are an important source of value creation that can be exploited within the whole MNE network. Such units may represent 'centers of excellence' (Frost et al. 2002), efficient

export-oriented platforms (Girma et al. 2005; Hogenbirk et al. 2006), or sources of ‘reverse’ knowledge flows to other parts of the corporate group (Meyer et al. 2011),

We concentrate in the first model due to its practical importance for peripheral countries and because the largest part of FDI is market-seeking in nature. Also in the European unified area localization tendencies are relatively strong, and national markets remain fragmented to a high degree through differences in demand (e.g., taste differences). Hence, new market-seeking affiliates created via horizontal-FDI dominate. These affiliates primarily adapt products and services supplied by their parent company in order to increase their ability to meet the taste characteristics of local customers. Hence, their assets are bound to location-specific conditions of the host country, exhibit a limited international applicability (Delios and Beamish, 2001), and encourage localization of activities (Morgan and Wakelin, 1999). The specific assets are downstream specific capabilities in the marketing field such as high advertising intensities, idiosyncratic advertising systems, brand names, distribution systems, and specific logistics, and are considered to be strong exit barriers that substantially decrease survival risk (Pennings and Sleuwaegen 2000; Anand and Delios 2002; Chen and Zeng 2004).

2.4. Testable hypotheses

Changing institutional, regulatory and economic contexts could cause shifts in the national location advantages, leading to another mixture of locational resources such as natural and new created assets (e.g. Dunning 2000; Narula and Dunning 2000), that form a different basis for the survivorship of MNE affiliates. The new type of landscaping begins to fit even more the dynamic world which encompasses imperfect competition, increasing returns, decreasing trade costs, high product differentiation, and human capital.

Based on the above framework, the objective of the paper is twofold; the identification of the characteristics of affiliates according to their types and the investigation of the impact of these (identified) characteristics on the survival risk of affiliates within the integration period. The later research aim which is the main objective of the paper is examined through three research hypotheses:

Hypothesis 1: In the context of integration the removal of tariffs is likely to increase the survival risk of foreign affiliates (positive sign)

Hypothesis 2: In the context of integration the advertising intensity is likely to reduce the survival risk of foreign affiliates (negative sign)

Hypothesis 3: In the context of integration unskilled-labor cost is likely to increase the survival risk of foreign affiliates (positive sign)

3. Data description, methodology, and main results

3.1. Data and variables

We identify foreign affiliates in the official lists provided by all Foreign Chambers of Industry and Commerce based in Greece. The lists contain all foreign manufacturing and trade units that operate in the country, with full data such as address, location, year of establishment, management, product groups, and industrial sector. In order to avoid any statistical bias due to the cross sectional heterogeneity we filter our dataset, as follows:

Firstly, we choose relatively mature affiliates in order to guarantee that a potential high survival risk is not the outcome of liability of foreignness or the liability of newness which primarily occur in the early post-entry stages. Secondly, we choose the affiliates that exhibit a stable ownership structure in terms of a relatively constant foreign participation in their equity capital and a low dispersion of it, nullifying the probability of a high hazard due to internal management failure. Finally, we set a minimum threshold for the labor force of affiliates (30 individuals) in order to eliminate the high survival risk due to the liability of smallness. Thus, we create a relative homogeneous and unique longitudinal dataset that systematically captures 162 manufacturing affiliates.

The set of the explanatory variables consists of the exogenous variables and the instrumental variables, resulting in a set of strategic variables and a set of control variables which contains the affiliate- and the industry-specific variables. In the first category, three variables are under investigation, *tariffs*, *market* and *labor*. The

variable *tariffs* is defined as the nominal protection rate across time with a 4-digit level, NACE industrial classification. That is, the share in percentage of tariffs applied on industrial imports (Culem, 1988). The specific share is weighted by the percentile share of local sales to total sales of the examined affiliates because a purely export-oriented affiliate in a protected branch would have no benefits from tariff protection. The variable *labor* is defined as the labor cost unit for each industry, at 4-digit level, over time (see also Culem 1988; Morgan and Wakelin, 1999; Mold 2003). These costs are weighted by the percentile share of labor costs in total operating costs of the examined affiliates since the importance of the variable rises as an affiliate intensifies the relative use of the specific production factor. The variable *market* is defined as the share of advertising costs in turnover. This indicator is suggested by several scholars such as Morgan and Wakelin (1999), Pennings and Sleuwaegen (2000), Anand and Delios (2002), Chen and Zeng (2004), and Taymaz and Özler (2007) and is, also, used in international trade and FDI studies for product differentiation measurements, which are directly related to horizontal market-seeking FDI (Caves, 1991). In addition, this index is appropriate for consumer products such as food, drinks, cosmetics, electrical goods etc. where market-seeking plants dominate (as in the Greek case). Moreover, the above indicator reflects a consistent advertising policy which aims to demonstrate the utility of these products to the specific local consumer in accordance with his specific tastes and needs (Morgan and Wakelin, 1999).

The affiliate specific control variables consist of the *t_event*, *current size*, *human*, and *expo*. In particular, *t_event* is defined as the time period between the time of establishment and the time of closure or the current year of observation (for the survivors) and examines whether the length of tenure in a specific national market matters. The accumulation of host country experience (learning curve) may decrease the operational and survival risk (Mudambi 1998; Mitchell et. al. 1994; Shaver et. al. 1997). *Size* expresses the current size based on labor force (ln) and indicates if economies of scale may influence survival risk. *Human capital* measures the share of degree holders of university and technical education (post-secondary education) in total labor force and reveals the impact of skill intensity on the survival outcome (Bernard and Jensen 2007; Bandick 2010). *Expo* captures the share of export sales in total sales and indicates the impact of export status on affiliate survivorship (Alvarez

and Görg 2005; Bernard and Jensen 2007; Colantone and Sleuwaegen 2010; Bandick 2010; Gelübcke and Wagner 2012).

Finally, the last category consists of three industry-specific control variables; *tech* (technology-intensity), *open* (openness) and *indu* (type of industry) of the industry in which the affiliate operates. The variable *tech* is a dummy variable which takes the value of 1 if the industry is technology intensive and 0 otherwise (Pennings and Sleuwaegen 2000). The creation of *tech* takes into account the evidence on the European industry. The variable *open* expresses the sum of the import penetration and export orientation ratio for each industry, showing whether global competition matters (Colantone and Sleuwaegen 2010). Gelübcke and Wagner (2012) suggest that openness on the import and export side decreases the probability of exit. *Indu* (NACE industrial classification 4-digit level) classifies 17 industries into 5 categories moving from traditional to non-traditional industries. In particular, category 1 contains foods, beverages and tobacco, category 2 captures garments, textiles, leather, and paper, category 3 comprises chemicals, petroleum, and plastics, category 4 contains non-metallic minerals, primary metals, and metal products, and category 5 includes electrical products, machines, means of transportation, and other industries.

3.2. Methodology

For the investigation of the research aim we develop a stringent methodology to examine empirically the hypotheses formulated above. The first part of our analysis focuses on the identification of the specific characteristics per affiliate type and furthermore, investigates the changing features moving from TJ to NMS. For the analysis we apply logistic regression models. The second part, aims at determining the features that affect the affiliate survivorship, using complementary log-log models.

Within the first part of the analysis, the first step is the identification of main characteristics of affiliate type. We use four model specifications for each affiliate type: $type_j = f(\text{strategic variables}, \text{affiliate specific}, \text{industry specific})$, where j stands for TJ, NMS and RS affiliate types. The dependent variable for each of the three regressions ' $type_j$ ' is a dummy variable which takes the value of one if the

affiliate under examination is j and zero otherwise. In order to increase the reliability of our analysis we apply a stepwise approach as follows:

model 1: $type_j = f(\textit{strategic variables})$

model 2: $type_j = f(\textit{strategic variables, affiliate specific})$

model 3: $type_j = f(\textit{strategic variables, industry specific})$

model 4: $type_j = f(\textit{strategic variables, affiliate specific, industry specific})$

Thus, the first model considers only the strategic variables (tariff, market, labor) as the basic characteristics of the three affiliate types. The second and the third model capture the affiliate- (size, human, expo, t_event) and the industry-specific variables (tech, open, industry), respectively. Finally, the fourth model incorporates all these variables in an integrated construct. It is worth mentioning that we apply the above methodology for the whole investigation period (1960-2011) and for the European integration period (1981-2011).

The second step of our logistic regression analysis explicitly focuses on the TJ and NMS sample affiliates, in order to show the changing importance of affiliate characteristics when moving from TJ to NMS. As before, we apply the stepwise four-model procedure:

model 1: $type_{TJ=0, NMS=1} = f(\textit{strategic variables})$

model 2: $type_{TJ=0, NMS=1} = f(\textit{strategic variables, affiliate specific})$

model 3: $type_{TJ=0, NMS=1} = f(\textit{strategic variables, industry specific})$

model 4: $type_{TJ=0, NMS=1} = f(\textit{strategic variables, affiliate specific, industry specific})$,

where the dependent variable is a dummy which takes the value of one for NMS and zero for TJ affiliates. This analysis is performed for the whole time period (1960-2011) and for the first and second integration periods, (1981-1991 and 1992-2001, respectively) where most of the TJ affiliates were transformed into NMS.

The last part of our methodology deals with the survival analysis. By application of the complementary log-log model which could be considered as the discrete time specification of the Cox proportional hazard model we explore the statistical and economic significance of the strategic and control variables on the likelihood of affiliate survivorship, according to the following equations: $P(\text{survival}) = F(\text{explanatory variables})$, where the dependent variable is a dummy variable which takes the value of one in the case of closure and zero otherwise, $F(\cdot)$ is a non-linear function of the form: $F(z) = 1 - e^{-e^z}$ and the set of explanatory variables consists of the abovementioned four-model approach:

$$\text{model 1: } P(\text{survival}|x) = f(\text{strategic variables})$$

$$\text{model 2: } P(\text{survival}|x) = f(\text{strategic variables, affiliate specific})$$

$$\text{model 3: } P(\text{survival}|x) = f(\text{strategic variables, industry specific})$$

$$\text{model 4: } P(\text{survival}|x) = f(\text{strategic variables, affiliate specific, industry specific})$$

In order to estimate the coefficients of the model we use the MLE methodology as follows:

$$P(\text{survival}_j|x_j) = 1 - e^{(-e^{x_j b})} \quad \text{and} \quad \ln L = \sum_j^n w_j \ln(F(x_j b)) + \sum_{j'}^{n'} w_{j'} \ln(1 - F(x_{j'} b))$$

The estimation of the coefficient in all these model specifications enables us to make inferences regarding the significance and the sign of the effects that the explanatory variables exercise on the survivorship. The application of the aforementioned stepwise procedure to the three integration stages attempts to increase the reliability and robustness of our empirical findings. However, for parsimonious reasons we present only the integrated models (model (4)) since the results of all model specifications do not change qualitatively, while the analytical stepwise results are available upon request.

3.3. Main results

3.3.1. Descriptive statistics

Table 1 shows that all sample affiliates (162) were created in the protectionist era, i.e. 70 units in the 1960's and 92 in the 1970's. At the end of a long integration process, 78 affiliates survived and the other 84 shut down. Closures were mainly observed in TJ- and RS- affiliates which at the end of the second integration stage disappeared (either totally or partially). As regards TJ-affiliates (137), 56 closed down and the others (81) transformed to NMS-affiliates (Table 1). Furthermore, from out of a total of 25 RS-affiliates, 22 shut down and the other 3 survived due to the exploitation of agricultural resources (Table 1). By contrast, NMS-affiliates emerged and expanded in the 1980's (stage I), developed further in the 1990's (stage II), and stabilized their presence in the 2000's with a small number of closures (stage III) (Table 1). Consequently, NMS-affiliates dominated in the third integration stage. Table 2 and Figure 1 present the chronological evolution (closures vs. survivors) of all examined affiliates clearly arranged, from year to year. Overall, the major adjustments of the MNE affiliates took place between the mid of the 1980's and the mid of the 1990's.

Table 1 & 2, & Figure 1 about here

As shown in Table 3, each affiliate type is associated with specific characteristics. This is consistent for either the whole time period (panel A: 1960-2011) or for the integration period (panel B: 1981-2011). These statistics shed much light on the differentiation among the mean values of the strategic variables for the three affiliate types. So, there is evidence that for the TJ-affiliates, *tariffs* have a greater mean than for NMS- and RS-units. The specific difference was reduced to half during the integration period. Moreover, market (advertising) and human capital intensity by NMS-affiliates was dominant in both examined periods. Additionally, labor costs seem to be higher in the case of RS-affiliates as compared to other two types. The difference became larger in the integration period. Export orientation by RS *de facto* outperformed the corresponding trend of the other types which were *by definition* oriented to local market. RS- and NMS-units were operated in relatively open industries. As regards the variable *size*, all affiliates tend to have similar mean values.

A more systematic picture of temporal changes in the explanatory variables is given by graphs. Figure 2 shows that tariff protection eliminated totally at the beginning of the 1990's with negative survival implications mostly in the tariff-jumping units. Figure 3 indicates that a substantial rise of market (advertising) intensity was observed since the mid of the 1980's and was closely associated with the occurrence and development of the NMS-affiliates. Figure 4 reveals that unskilled labor costs for all affiliates increased steadily by the mid 1990's. Afterwards they followed a declining trend due to the massive closures of the RS-affiliates and the rationalization procedures of the NMS-affiliates. Figure 5 illustrates that human capital intensity rose remarkably during the whole integration period and was an important characteristic for survival especially for the NMS-affiliates. In total, the MNE affiliates substituted massively unskilled labor through human capital during the integration process with positive survival results. Figure 6 shows that the export orientation for all affiliates was reduced drastically since the mid of the 1990's mainly due to the massive closures of the RS-units and the important increase in the NMS-affiliates which have strong inward-looking characteristics. At the same time, all MNE affiliates located in industries with on average increasing openness (Fig. 7). Hence the affiliates were exposed to intensified global competition. Finally, the average size of all affiliates increased over time to a specific degree (Fig. 8).

Figure 2 to Figure 8 about here

Moreover Table 4 reports Pearson correlations between the independent variables for the whole sample and for the integration period separately. For all affiliates, market intensity is positively connected with human capital intensity. Also, market intensity is negatively associated with tariffs. Moreover, a positive relationship between labor and expo and between labor and open exists.

Table 4 about here

3.3.2. Econometric results

In the following we capture the main distinct characteristics of each affiliate type applying logistic regression models (Table 5). We conclude that the most important

characteristic for the TJ-affiliates is tariffs both in the overall period and the period of integration. Indeed, the importance of the variable seems to become statistically more important during the integration process. Another important strategic variable is unskilled labor cost but with decreasing importance in the integration period as the specific production factor became relatively expensive. In any case, it seems that the TJ-affiliates, apart from their main investment motive (tariff), had also other secondary motives. Moreover, using unskilled labor to a high degree, they demonstrated low human capital intensity. Furthermore, the specific units exhibited a relatively low advertising intensity (market), a low export orientation, and they were large, mature (t_event) located in relatively closed industries which could be characterized as high-tech. The production of high tech goods was possible due to high protection.

The most important characteristic for the NMS-affiliates seems to be market intensity with an increasing tendency in the integration era. In addition, the specific affiliates show strong human capital intensity, exploiting unskilled labor to a very low degree. Furthermore, they were relatively young (as they have emerged since the mid of the 1980's), of relatively smaller size, and *per definition* inward-looking. They operated in relatively opened industries because they were competitive due to market proximity and location advantages in traditional industries in which Greece had comparative advantages at that time.

The main characteristic for RS-affiliates appears to be the exploitation of unskilled labor. Inevitably, they exhibit low human capital intensity. At the same time, as expected, in the specific category, the variables tariff, and market are statistically significant with a negative sign. These affiliates were *a priori* export-oriented (therefore we excluded the variable expo from the analysis), relatively mature, operating in open, traditional industries such as textiles and clothing. Probably because of their high export orientation, they could achieve economies of scale, though their big size (measured by the number of employees) is the outcome of their labor-intensive nature.

Table 5 about here

Subsequently, we concentrate further in the characteristics of the NMS-affiliates. We deepen the analysis of these units since they play a strategic role in our sample (and in the Greek economy by extension) and are the product of adjustment dynamics. The two types of affiliates comprise 85% of our sample. The specific logistic regression results are given in Table 6. The Table focuses on the affiliate characteristics which influence the passage from TJ- to NMS-affiliates, either positively or negatively. The results indicate that the variables labor, tariff, size, expo, t_event, and tech play a negative role in this adjustment. In the second integration period the negative influence of tariffs disappear due to the total elimination of protectionism measures. By contrast, the variables market, human capital, and open facilitate the transformation of TJ into NMS. In particular, in the second integration stage, the positive role of the variables market and human intensity seems to have gained importance.

Table 6 about here

We proceed with the survival analysis. Figure 9 displays the Kaplan-Meier survivor curves for all foreign affiliates and for each affiliate type by investment motive (motive 1 = tariff-jumping; motive 2 = new market-seeking; motive 3 = resource-seeking). It is shown that NMS affiliates have a stronger ability to survive as compared to the other two types that almost disappeared during the first two integration decades as indicated by the sharp downward trends of the curves. These findings are further supported by the surviving curves which show the proportion of surviving firms at each point in time, thus confirming our research hypothesis.

Figure 9 about here

In the following, we exhibit the econometric complementary log-log findings. For the better understanding of the econometric results, we note that a positive sign of an estimated coefficient implies a higher survival risk (i.e. closure) and *vice versa*. The regression results are presented in Table 7. We follow a stepwise approach considering separately the exogenous factors and the instrumental variables. Furthermore, as shown in Table 7 we estimate the models for the whole integration period and for each integration stage to check for robustness.

The research hypotheses concerning the three strategic variables are confirmed through all different periods and all models. More specifically, *tariffs* and *labor* increase the survival risk, in contrast to *market* that reduces the survival risk (it strengthens survival). The strategic variables are statistically significant at 1% level even when we incorporate the control variables in our models.

Concerning the affiliate-specific variables (model 2, 4), we found also interesting and relatively robust results. Specifically, the variable *size* has a positive sign in all models, thus rising current size increases survival risk, indicating that flexibility advantages due to smaller size are more important for survival than economies of scale . Moreover, the variable *expo* has mostly a positive impact on closure (apart from the findings in the second integration stage), potentially because the expo-oriented, labor-seeking affiliates lost their competitiveness in the international markets. Furthermore, the variable *human* considerably decreases survival risk in all periods and models. Human capital intensity seems to be of crucial importance for productivity and quality. The findings are statistically significant at 1% level. Additionally, *t_event* has mostly a significant and negative influence in hazard rate. This survival effect of *t_event* indicates that more experienced units exhibit more chances to survive over time.

As regards the industry-specific variables (model 3, 4), we found that the impact of *tech* on survival risk across models and different periods appears to be positive. This means that operation in high-tech industries significantly increases hazard of all affiliates. Obviously, the Greek economy possesses comparative disadvantages in such industries. At the same time, location in relatively *open* industries mostly dampens foreign survival risk. Probably operation in an open environment may contribute to more efficiency and rationalization, and finally produce positive effects in the affiliate survivorship.

Table 7 about here

The empirical findings are consistent with our conceptual framework and support strongly our hypotheses, with interesting policy implications and venues for future research, which are discussed next.

4. Discussion and policy implications

We investigated 162 mature MNE affiliates in Greece that struggled to survive in a quite new institutional context. Specifically, these affiliates were created in the era of protectionism (1960-1980) and continued to operate at least up to the beginning of the European integration process (1981-2011). Within the integration period, several units closed down and the others survived after adjustment until the end of the investigation.

Using a unique database covering the post-War II period, our empirical analysis distinguished three affiliate types according to their investment motives, highlighting their main corresponding characteristics. Moreover, it clearly demonstrated which of these identified characteristics undermined or favored survival during integration. We hypothesized and found that in the single market survival risk was relatively high for those affiliates based on the exploitation of traditional advantages such as tariffs and unskilled-labor and relatively low for those investing in specific assets such as product differentiation through higher advertising and human capital intensity.

The findings are robust both for the overall integration era and for its individual stages. In this way, our study offered some new insights in the survival phenomenon highlighting the differential effects of the main affiliate features on hazard rate. In particular, our analysis demonstrated that external dynamic changes caused by integration and the specific development path of the Greek economy, led to a removal of tariffs and a substantial rise of labor cost. So, half of the tariff-jumping-affiliates were transformed to new market-seeking units and the others were forced to shut down as in the case of almost all resource-seeking units. Thus at the end of the examined period all surviving affiliates in Greece were *de facto* market-seeking in nature with only few exceptions. These findings underline the importance of market proximity and product differentiation to prolong foreign survivorship. However, it is clear that this specific type of investment has its own development constraints due to the smaller size of the Greek economy and the current deep stagnation of the local market, given that such investment represents *by definition* inward-looking activity.

Our conclusions have several implications for policy-makers and researchers. Policy makers should take into account that long-term internal learning effects (as suggested

by an organizational learning perspective, e.g., Delios & Beamish, 2001; Mitchell et al. 1994; Shaver et al, 1997) of vulnerable labor-intensive and tariff-jumping units are expected to be relatively limited in a changing framework (Narula and Dunning 2000; Belderbos, 2003). Therefore, policy makers, especially in small peripheral countries should search for and offer high quality locational assets (e.g., agglomeration economies, clusters, human capital) to attract new FDI seeking not only for market proximity but also for more efficiency in higher value-added and export-oriented operations (e.g., Dunning, 2000). This policy is of crucial importance especially for Greece given the massive closures of the earlier ventures which created a substantial FDI gap caused by the export trade of MNEs that replaced FDI.

Given that survival prospects depend on the external context, future research could address the evolution of survivorship of FDI affiliates in a comparative multicultural framework.

A limitation of our research is that by studying a small, peripheral country in Europe it cannot be excluded that doing business in the periphery may undermine survival to a greater extent than being active in the European core. Another probable limitation stems from the non-exploration of efficiency-seeking affiliates due to their complete absence in the economy. Despite the aforementioned limitations, our empirical study contributes to the extant literature by highlighting the diverse importance of exogenous and instrumental variables on the survival risk of mature MNE affiliates within a changing, more integrated economic environment.

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TABLES

Table 1: Evolution of the survivorship of the 162 foreign affiliates

Affiliates	Protectionism		Integration						total
	1960-1980		Stage I: 1981-1991		Stage II: 1992-2001		Stage III: 2002-2011		
	1960-70'	1971-80'	1981-85'	1986-91'	1992-96'	1997-01'	2002-06'	2007-11'	
Total									
Establishments	70	92	0	0	0	0	0	0	162
Closures	0	0	0	13	43	21	5	2	84
Survivors(3)	70	162	162	149	106	85	80	78	78
TJ									
Establishments	64	73	0	0	0	0	0	0	137
Closures	0	0	0	12	33	11	0	0	56
Transformed(1)	0	0	2	53	21	5	0	0	81
Survivors(4)	64	137	135	70	16	0	0	0	0
NMS									
Establishments(2)	0	0	2	53	21	5	0	0	81(5)
Closures	0	0	0	0	0	0	4	2	6
Survivors(3)	0	0	2	55	76	81	77	75	75
RS									
Establishments	6	19	0	0	0	0	0	0	25
Closures	0	0	0	1	10	10	1	0	22
Survivors(3)	6	25	25	24	14	4	3	3	3

TJ= tariff-jumping; NMS = market-seeking; RS = resource- (labor-) seeking

(1)= transformed to NMS; (2) = stemmed from TJ; (3) = cumulative values (establishments – closures);

(4) = cumulative values (establishments - closures - transformed)

(5) = this expresses the number of TJ transformation to NMS and consequently it is not considered in the calculation of the total number of establishments

Table 2: Survivors and closures of the 162 foreign affiliates

Year	CLOSURES				SURVIVORS			
	Total	TJ	NMS	RS	Total	TJ(1)	NMS(1,2)	RS(1)
Integration stage I (1981-1991)								
1981	0	0	0	0	162	137	0	25
1982	0	0	0	0	162	136	1	25
1983	0	0	0	0	162	135	2	25
1984	0	0	0	0	162	135	2	25
1985	0	0	0	0	162	135	2	25
1986	0	0	0	0	162	133	4	25
1987	1	1	0	0	161	126	10	25
1988	2	1	0	1	161	115	22	24
1989	4	4	0	0	155	97	34	24
1990	0	0	0	0	155	86	45	24
1991	6	6	0	0	149	70	55	24
Integration stage II (1992-2001)								
1992	7	6	0	1	142	58	61	23
1993	11	10	0	1	131	43	66	22
1994	6	4	0	2	125	36	69	20
1995	9	6	0	3	116	28	71	17
1996	10	7	0	3	106	16	76	14
1997	8	3	0	5	98	10	79	9
1998	4	3	0	1	94	6	80	8
1999	2	1	0	1	92	4	81	7
2000	2	2	0	0	90	2	81	7
2001	5	2	0	3	85	0	81	4
Integration stage III (2002-2011)								
2002	1	0	0	1	84	0	81	3
2003	0	0	0	0	84	0	81	3
2004	1	0	1	0	83	0	80	3
2005	1	0	1	0	82	0	79	3
2006	2	0	2	0	80	0	77	3
2007	1	0	1	0	79	0	76	3
2008	0	0	0	0	79	0	76	3
2009	1	0	1	0	78	0	75	3
2010	0	0	0	0	78	0	75	3
2011	0	0	0	0	78	0	75	3
Total								
	84	56	6	22				

TJ= tariff-jumping; NMS = market-seeking; RS = resource- (labor-) seeking
(1)= cumulative values (establishments – closures); (2)= stemmed from TJ

Table 3. Descriptive Statistics of the explanatory variables

Panel A

Variable	descriptives - whole period							
	all affiliates		TJ		NMS		RS	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
labor	8.896	14.219	4.755	9.517	9.572	2.454	24.835	31.176
tariff	15.810	22.843	30.160	24.241	0.399	1.460	1.360	3.097
market	23.455	27.198	12.189	12.844	45.404	31.490	4.061	5.193
size	16.617	12.070	14.287	10.031	19.865	13.892	16.636	11.761
expo	14.978	29.135	4.819	7.345	4.770	7.677	91.089	14.425
human	18.672	12.857	11.629	6.457	30.691	11.960	11.857	7.764
open	58.833	28.299	47.978	17.314	69.135	27.873	73.998	44.590

Panel B

Variable	descriptives - integration period: 1981-2011							
	all affiliates		TJ		NMS		RS	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
labor	12.079	15.884	8.438	12.259	9.572	2.454	37.074	33.465
tariff	6.048	10.603	15.727	12.335	0.399	1.460	0.225	0.901
market	29.550	29.674	14.287	14.092	45.404	31.490	4.551	5.693
size	17.676	12.607	14.604	10.080	19.865	13.892	17.582	11.606
expo	14.521	28.233	5.986	8.735	4.770	7.677	92.155	13.591
human	23.117	12.708	15.145	6.334	30.691	11.960	13.533	8.900
open	65.266	29.467	52.204	16.898	69.135	27.873	91.615	44.584

Table 4. Correlation Coefficient of the explanatory variables

all affiliates - whole period: 1960-2011							
Variable	labor	tariff	market	size	expo	human	open
labor	1						
tariff	-0.334 <i>0.000</i>	1					
market	-0.046 <i>0.001</i>	-0.350 <i>0.000</i>	1				
size	0.015 <i>0.264</i>	-0.173 <i>0.000</i>	0.334 <i>0.000</i>	1			
expo	0.435 <i>0.000</i>	-0.232 <i>0.000</i>	-0.265 <i>0.000</i>	0.017 <i>0.225</i>	1		
human	0.078 <i>0.000</i>	-0.494 <i>0.000</i>	0.609 <i>0.000</i>	0.334 <i>0.000</i>	-0.165 <i>0.000</i>	1	
open	0.541 <i>0.000</i>	-0.363 <i>0.000</i>	0.126 <i>0.000</i>	0.127 <i>0.000</i>	0.211 <i>0.000</i>	0.289 <i>0.000</i>	1

the numbers below the estimated parameters represent the p-values

all affiliates - integration period: 1981-2011							
Variable	labor	tariff	market	size	expo	human	open
labor	1						
tariff	-0.168 <i>0.000</i>	1					
market	-0.191 <i>0.000</i>	-0.378 <i>0.000</i>	1				
size	-0.034 <i>0.037</i>	-0.173 <i>0.000</i>	0.361 <i>0.000</i>	1			
expo	0.555 <i>0.000</i>	0.194 <i>0.000</i>	-0.305 <i>0.000</i>	0.042 <i>0.010</i>	1		
human	-0.140 <i>0.000</i>	-0.477 <i>0.000</i>	0.558 <i>0.000</i>	0.361 <i>0.000</i>	-0.240 <i>0.000</i>	1	
open	0.517 <i>0.000</i>	-0.269 <i>0.000</i>	0.002 <i>0.926</i>	0.089 <i>0.000</i>	0.316 <i>0.000</i>	0.145 <i>0.000</i>	1

the numbers below the estimated parameters represent the p-values

Table 5. Characteristics of the affiliate types

Variable	logistic regression for each type of affiliates					
	protectionsim period			integration period		
	1960-1980			1981-2011		
	TJ	NMS	RS	TJ	NMS	RS
c	0.270 <i>0.497</i>	2.319 *** <i>0.000</i>	-4.567 *** <i>0.000</i>	0.752 * <i>0.070</i>	2.314 *** <i>0.000</i>	-7.250 *** <i>0.000</i>
labor	0.105 *** <i>0.000</i>	-0.130 *** <i>0.000</i>	0.032 *** <i>0.000</i>	0.081 *** <i>0.000</i>	-0.127 *** <i>0.000</i>	0.071 *** <i>0.000</i>
tariff	0.500 *** <i>0.000</i>	-0.657 *** <i>0.000</i>	-0.237 *** <i>0.000</i>	0.613 *** <i>0.000</i>	-0.655 *** <i>0.000</i>	-0.316 *** <i>0.000</i>
market	-0.062 *** <i>0.000</i>	0.073 *** <i>0.000</i>	-0.125 *** <i>0.000</i>	-0.078 *** <i>0.000</i>	0.081 *** <i>0.000</i>	-0.091 *** <i>0.000</i>
size	0.025 *** <i>0.001</i>	-0.044 *** <i>0.000</i>	0.058 *** <i>0.000</i>	0.046 *** <i>0.000</i>	-0.046 *** <i>0.000</i>	0.050 ** <i>0.002</i>
expo	-0.079 *** <i>0.000</i>	-0.056 *** <i>0.000</i>		-0.048 *** <i>0.000</i>	-0.052 *** <i>0.000</i>	
human	-0.085 *** <i>0.000</i>	0.130 *** <i>0.000</i>	-0.204 *** <i>0.000</i>	-0.106 *** <i>0.000</i>	0.126 *** <i>0.000</i>	-0.184 *** <i>0.000</i>
t_event	0.027 * <i>0.061</i>	-0.104 *** <i>0.000</i>	0.319 *** <i>0.000</i>	0.061 *** <i>0.000</i>	-0.106 *** <i>0.000</i>	0.336 *** <i>0.000</i>
tech	1.644 *** <i>0.000</i>	-1.654 *** <i>0.000</i>	- <i>-</i>	1.906 *** <i>0.000</i>	-1.682 *** <i>0.000</i>	
open	-0.033 *** <i>0.000</i>	0.033 *** <i>0.000</i>	0.004 <i>0.353</i>	-0.051 *** <i>0.000</i>	0.033 *** <i>0.000</i>	0.013 ** <i>0.002</i>
ind1	0.947 *** <i>0.000</i>	-1.805 *** <i>0.000</i>			-1.884 *** <i>0.000</i>	
ind2	-2.746 *** <i>0.000</i>	-2.036 ** <i>0.002</i>		-1.580 ** <i>0.007</i>	-2.007 ** <i>0.003</i>	
ind3		-0.666 ** <i>0.006</i>			-0.652 ** <i>0.007</i>	
ind4						
ind5						
# of obs	5348	5348	2476	3757	3757	1788
LR chi2	6183	6126	2108	3926	4299	1482
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000
Log likelihood	-613	-455	-351	-512	-450	-209
Pseudo R2	0.835	0.871	0.750	0.793	0.827	0.780

(*),(**) and (***) denote significance at 10%, 5% and 1% respectively
the numbers below the estimated parameters represent the t-statistics

Table 6. Tariff Jumping move to New Market Seeking (TJ → NMS)

Variable	Logistic regression for TJ and NMS (TJ:0, NMS:1)		
	whole period 1960-2011	Integration Stage I 1981-1991	Integration Stage II 1992-2001
c	1.990 *** <i>0.001</i>	0.988 * <i>0.065</i>	4.797 *** <i>0.000</i>
labor	-0.130 *** <i>0.000</i>	-0.159 *** <i>0.000</i>	-0.144 *** <i>0.000</i>
tariff	-0.660 *** <i>0.000</i>	-0.497 *** <i>0.000</i>	- -
market	0.074 *** <i>0.000</i>	0.051 *** <i>0.000</i>	0.331 *** <i>0.000</i>
size	-0.049 *** <i>0.000</i>	-0.036 *** <i>0.000</i>	- -
expo	-0.027 ** <i>0.017</i>		-0.063 * <i>0.075</i>
human	0.128 *** <i>0.000</i>		0.266 *** <i>0.000</i>
t-event	-0.097 *** <i>0.000</i>		-0.422 *** <i>0.000</i>
tech	-1.656 *** <i>0.000</i>	-0.930 ** <i>0.004</i>	-5.362 *** <i>0.000</i>
open	0.034 *** <i>0.000</i>	0.035 *** <i>0.000</i>	0.047 ** <i>0.011</i>
ind1	-1.554 *** <i>0.000</i>		-6.654 *** <i>0.000</i>
ind2			- -
ind3	-0.509 ** <i>0.041</i>	-0.517 * <i>0.057</i>	- -
ind4			- -
ind5			- -
# of obs	4717	1518	990
LR chi2	5520	885	738.9
Prob > chi2	0.000	0.000	0.000
Log likelihood	-445	-301	-68
Pseudo R2	0.861	0.596	0.844

(*), (**) and (***)

the numbers below the estimated parameters represent the t-statistics

Table 7. Survival analysis for all affiliates

Variable	complementary log-log regression for all affiliates and for each affiliate type															
	integration period: 1981-2011				integration stage I: 1981-1991				integration stage II: 1992-2001				integration stage III: 2002-2011			
	model 1	model 2	model 3	model 4	model 1	model 2	model 3	model 4	model 1	model 2	model 3	model 4	model 1	model 2	model 3	model 4
c	-0.591 *** 0.000	3.005 *** 0.000	-0.440 *** 0.089	3.791 *** 0.000	-0.758 *** 0.000	1.465 *** 0.000	-0.462 *** 0.07	2.118 *** 0.000	0.339 * 0.097	4.931 *** 0.000	-0.939 *** 0.295	6.879 *** 0.016	-21.08 0.81			-23.89 * 0.060
labor	0.068 *** 0.000	0.069 *** 0.000	0.071 *** 0.000	0.086 *** 0.000	0.107 *** 0.000	0.080 *** 0.000	0.098 *** 0.000	0.088 *** 0.000	0.047 *** 0.001	0.135 *** 0.000	0.088 *** 0.000	0.205 *** 0.000	2.216 0.95			2.272 ** 0.043
tariff	0.278 *** 0.000	0.279 *** 0.000	0.285 *** 0.000	0.291 *** 0.000	0.198 *** 0.000	0.226 *** 0.000	0.210 *** 0.000	0.238 *** 0.000	-	-	-	-	-			
market	-0.069 *** 0.000	-0.049 *** 0.000	-0.071 *** 0.000	-0.052 *** 0.041 *** 0.000	-0.031 *** 0.000	-0.028 *** 0.017 *** 0.001	-0.036 *** 0.000	-0.032 *** 0.025 *** 0.000	-0.134 *** 0.000	-0.230 *** 0.107 *** 0.000	-0.155 *** 0.000	-0.280 *** 0.000	-0.454 * 0.057			-0.720 * 0.060
size		0.032 *** 0.000		0.041 *** 0.000		0.017 *** 0.001		0.025 *** 0.000		0.107 *** 0.000		0.034 0.342				
expo		0.010 *** 0.000		0.008 *** 0.000		0.013 *** 0.000		0.014 *** 0.000		-0.029 ** 0.007		-0.066 *** 0.000				
human		-0.143 *** 0.000		-0.147 *** 0.000		-0.069 *** 0.000		-0.071 *** 0.000		-0.387 *** 0.000		-0.395 *** 0.000				
t_event		-0.081 *** 0.000		-0.085 *** 0.000		-0.065 *** 0.000		-0.071 *** 0.000		0.061 0.78		0.090 * 0.082				
tech			0.321 ** 0.026								1.157 *** 0.000	1.750 ** 0.029				-4.042 0.747
open			-0.017 *** 0.000	-0.021 *** 0.000		0.010 *** 0.001		-0.016 *** 0.000		-0.021 ** 0.002		-0.048 ** 0.037				0.085 0.106
ind1			1.030 *** 0.000			0.665 *** 0.000				2.160 *** 0.001		2.693 0.117				
ind2			1.680 *** 0.000	2.166 *** 0.000		0.737 *** 0.001	0.974 ** 0.02			3.385 *** 0.000		6.989 ** 0.006				-6.252 0.25
ind3			0.768 *** 0.000	0.675 *** 0.000		0.443 *** 0.000	0.511 *** 0.000			1.945 *** 0.001		0.692 0.627				
ind4			0.572 ** 0.004							2.013 *** 0.001		-0.240 0.866				
ind5																
# of obs	3759	3758	3758	3758	1764	1763	1764	1763	1154	1154	1154	1154	837			836
zero outcomes	1912	1912	1911	1912	292	292	292	292	810	810	810	810	810			809
nonzero outcomes	1847	1846	1847	1846	1472	1471	1472	1471	344	344	344	344	27			27
LR chi2	3476	4187	3640	4272	793	937	843	970	870	1266	946	1306	222			225
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			0.000
Log likelihood	-867	-511	-784	-468	-395	-323	-370	-306	-268	-70	-230	-50	-8			-7

(*), (**), (***) denote significance at 10%, 5% and 1% respectively
the numbers below the estimated parameters represent the t-statistics

Figure 1. Evolution and closures – overall and for each affiliate type

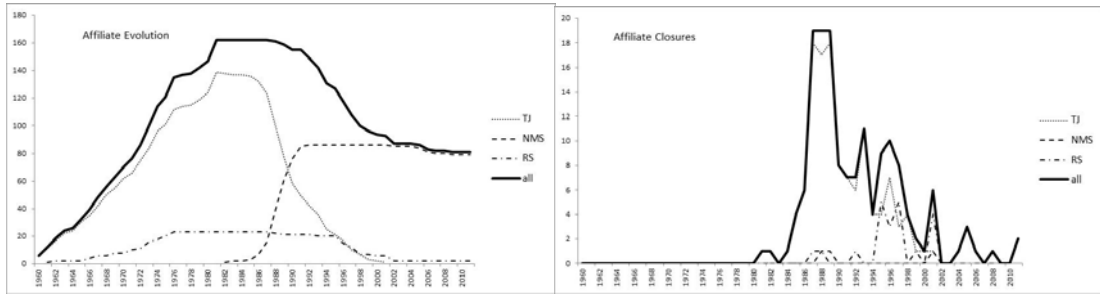


Figure 2. Mean value of Tariff – for all affiliates and affiliate type

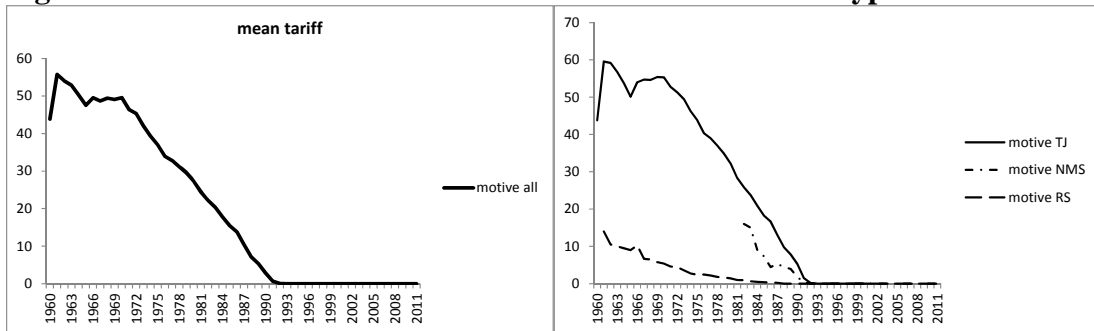


Figure 3. Mean value of Market – for all affiliates and affiliate type

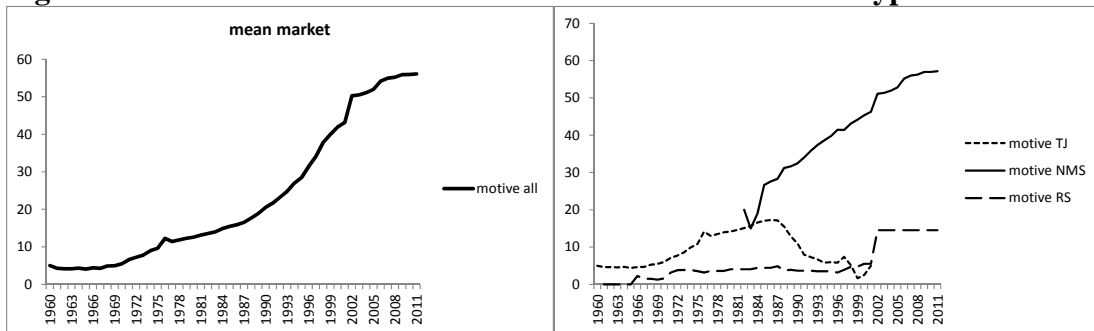


Figure 4. Mean value of Labor – for all affiliates and affiliate type

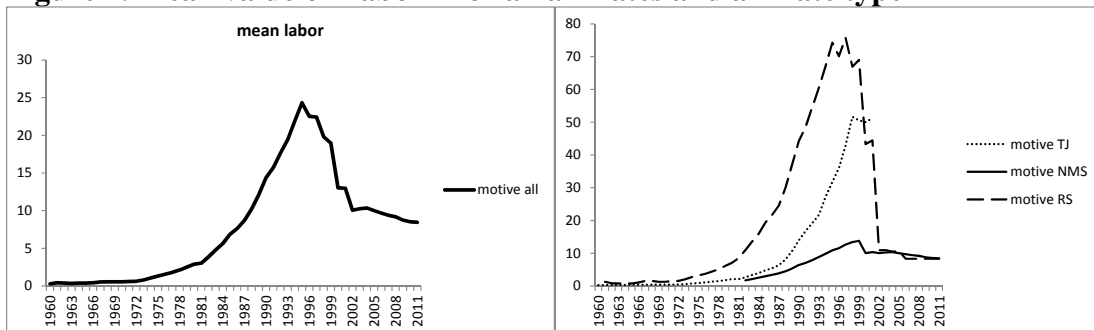


Figure 5. Mean value of Human – for all affiliates and affiliate type

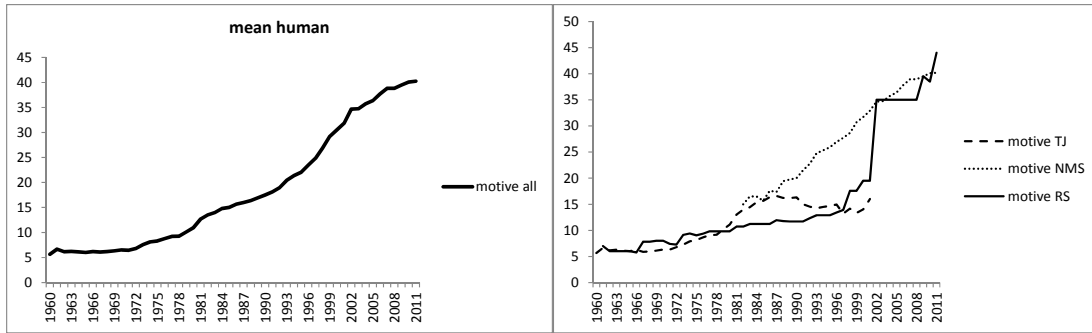


Figure 6. Mean value of Expo – for all affiliates and affiliate type

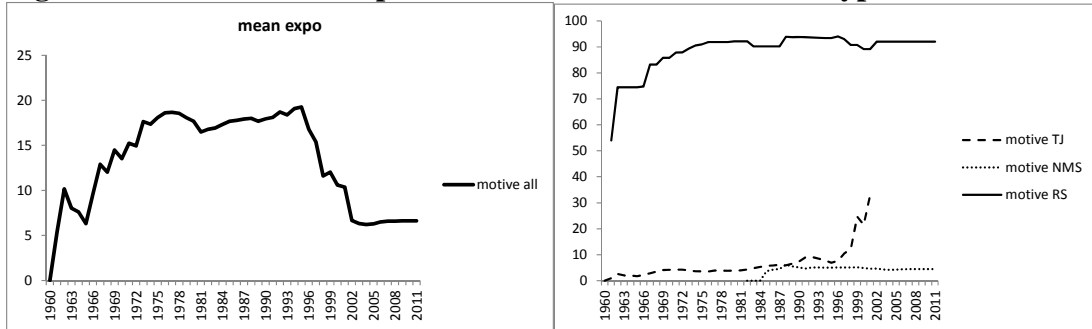


Figure 7. Mean value of Open – for all affiliates and affiliate type

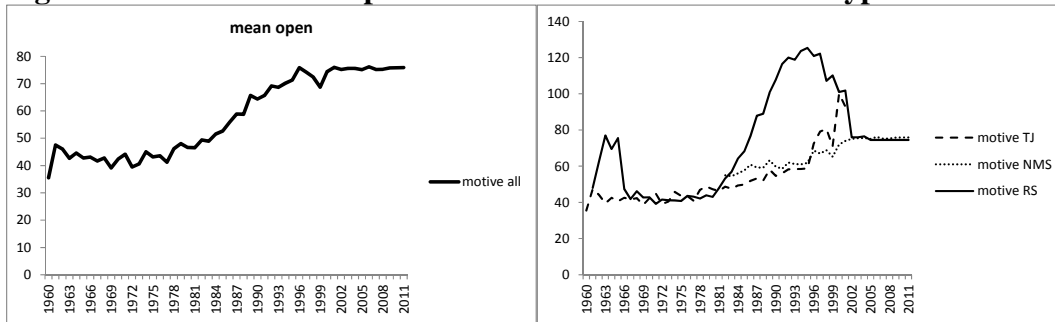


Figure 8. Mean value of Size – for all affiliates and affiliate type

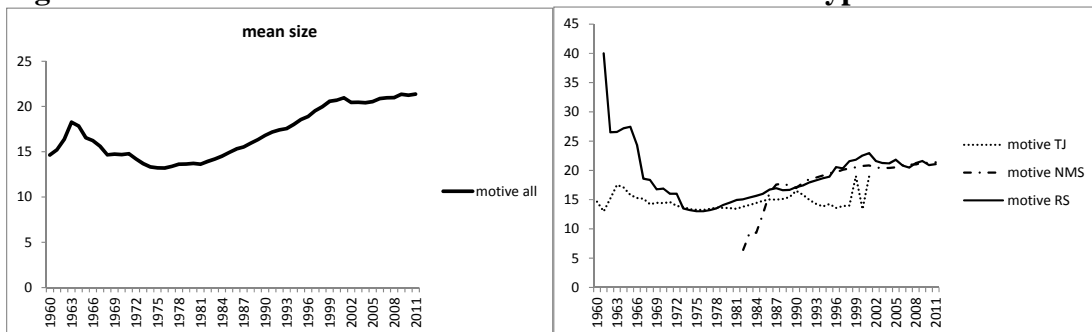
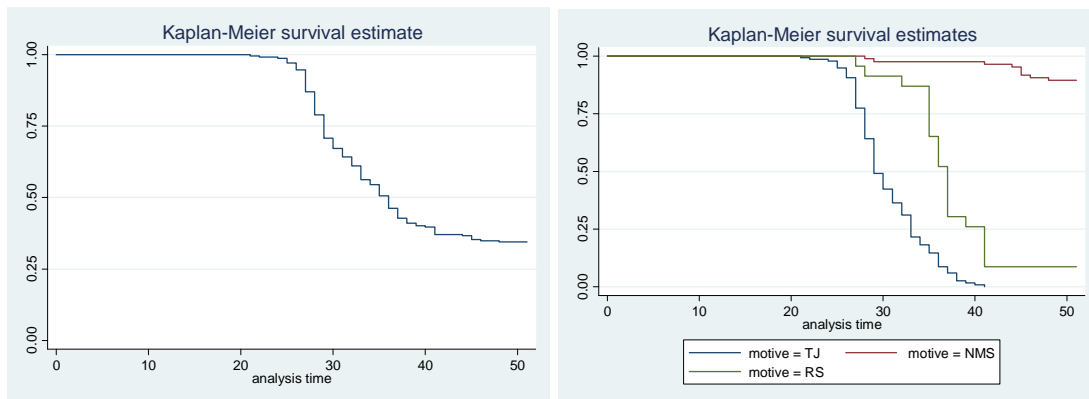
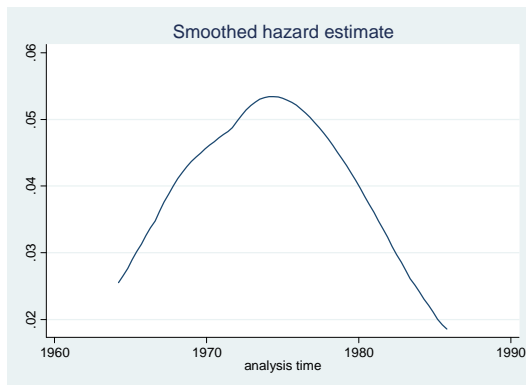


Figure 9 Survival Analysis

Panel A



Panel B: Smoothed hazard estimate



Panel C: Proportion of firms surviving

