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Firm Heterogeneity and Performance in a Turbulent Economic Environment: Evidence from Greece

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Firm Heterogeneity and Performance in a Turbulent Economic Environment: Evidence from Greece

Abstract

We examine the explanatory power of foreign ownership and domestic multinationality on firm performance among three different groups of sample firms over a turbulent economic period drawing on a unique dataset from Greece. Although the performance of each group of firms declines during the economic recession, we find that compared to Greek non-MNEs, foreign-owned firms show a profitability advantage, albeit at a lower profit performance level, and a much higher sales growth performance, considerably smoothing out fluctuations in sales. In turn, over the recession Greek MNEs do not achieve better performance compared to Greek non-MNEs, either in terms of profitability or of sales growth. This finding runs counter to the predominant view that the domestic multinationality factor per se matters, and prompts the need for future research to address particularly the performance impact of new multinationals from small and emerging economies. Hence, we suggest that neither domestic ownership nor domestic multinationality can boost firm performance in turbulent years.

Keywords:

Foreign-owned firms; Domestic multinationals; Domestic non-multinationals; Performance outcomes; Recession effects; Greece

Introduction

A growing stream of international business (IB) and management literature focuses on firm heterogeneity and its impact on performance (e.g., Mata and Portugal, 2002; Bellak and Pfaffmayr, 2002; Bellak, 2004). Firm heterogeneity may arise from factors such as foreign ownership and domestic multinationality, where foreign ownership involves foreign-owned firms in a specific host country, while domestic multinationality concerns indigenous firms with international business operations over different host countries. Such heterogeneous groups of firms might exhibit differing competitive abilities to operate in a particular local market, which can lead to performance asymmetry. Moreover, a drastic deterioration of contextual conditions under which firms operate might cause strong economic recession effects with an imprecise performance outcome.

When making performance comparisons, a typical business differentiation of heterogeneous enterprises is that between foreign-owned and purely domestic-owned firms. A standard perspective is that foreign firms must possess a countervailing advantage (advantages of foreign ownership) over local competitors, which have better information about their own country sufficient to outweigh the liability of foreignness (LOF) (Zaheer, 1995). Hence, ownership and internalization advantages must be balanced against the LOF (Dunning, 2000; Hymer, 1960; Kronborg and Thomsen, 2009). The literature reveals several performance gaps between foreign-owned firms and purely domestic enterprises, for example, in profitability and growth (for a literature review of such gaps see Bellak, 2004), often hypothesizing a systematic superior performance of foreign-owned firms (Bellak and Pfaffmayr, 2002; Chang et al., 2013; Dunning, 1993; Kumar, 1990; Willmore, 1986). We note that prior literature (e.g., Varum and Rocha, 2011; Van Beveren, 2007; Temouri et al., 2008; Bellak, 2004) uses terms such as 'foreign firms/MNEs/plants' when investigating the ownership effect on performance and comparing foreign-owned with domestic companies. In our analysis foreign-owned firms are subsidiaries of foreign MNEs operating in the domestic economy and domestic companies are Greek non-MNEs.

Recently, as domestic enterprises exhibit a growing degree of heterogeneity due to internationalization, a further differentiation within the group of domestic firms has been made, leading to a comparative performance analysis between domestic MNEs and domestic non-MNEs (e.g., Temouri et al., 2008). Some studies give more weight to gains from

multinationality *per se* due to internalization advantages and transfer and organization of firm-specific assets within the intra-firm network (Dunning, 1993; 2000) which can reduce the risk premium of international operations and increase the performance premium correspondingly. However, other studies provide a different picture challenging the general positive effects of multinationality (e.g. Contractor et al., 2003; Verbeke and Brugman, 2009; Powell, 2014).

It is notable that IB research has largely ignored the investigation of the impact of distinct firm characteristics on firm performance under radical external change (Keister, 2002; Perez-Batres and Eden, 2008). However, over time as the different groups of firms compete against each other, the possibility of a radical environmental change within a specific national context substantially increases, undermining firm performance. This phenomenon has been described by Perez-Batres and Eden (2008) as the liability of localness (LOL). In particular, LOL is expressed in external crisis effects that suddenly occur and can challenge the competitive strength of all groups of firms which operate in the same local environment. Based on the LOL approach, we suggest that a change in performance might stem from both the internal firm environment (e.g., ownership structure, multinationality) and the external context as well. Relatively few studies have explored the performance gaps of heterogeneous firms under deteriorating external conditions and especially under the impact of the recent financial crisis. Those that have fall into several types: studies that concentrate on the foreign-owned vs. domestic comparison (e.g., Varum and Rocha, 2011), comparative investigations of survival (Georgopoulos et al., 2014; Godart et al., 2012; Alvarez and Görg, 2009), and studies that investigate heterogeneous responses of several types of foreign ventures to the changing economic environment (Belderbos and Zou, 2007).

Here the central question raised is whether the LOL differentiates further performance and how firms react to environmental deterioration. In this framework, we explore whether firm-specific advantages such as foreign ownership and domestic multinationality can reverse the adverse performance effects of recession. Taking into account the diversity and heterogeneity of performance (Nakano and Kim, 2011; Roper, 1999), we focus on two of its main elements, that is, profitability and growth (dependent variables) and correspondingly develop two separate groups of hypotheses for the two specific performance indices.

The study contributes to the performance literature in several ways. First, unlike many other prior studies that concentrate either on the ownership or multinationality factors, we integrate both factors in our analysis and explore their relative performance impact. As regards foreign ownership, there is controversy over the relative advantage of foreignness and the liability of foreignness, with a presumed advantage of the former. Also, there is no unambiguous insight of its role during economic recession. Some prior survival studies report a similar pattern of firm reaction to economic crisis effects (e.g., Godart et al., 2012), Alvarez and Görg (2009) find that market-oriented foreign-controlled firms are affected more by a negative shock than indigenous enterprises, whereas Varum and Rocha (2011) support the view that foreign-owned firms are less affected by an economic crisis. Moreover, it is not clear that domestic multinationality improves firm performance since there is a growing body of IB literature that challenges the *a priori* advantages of multinationality with recent research being somewhat ambiguous as regards a linear relationship between multinationality and performance (e.g., Contractor et al., 2003) and the optimal level of multinationality (Powell, 2014). Additionally, such research has tended to focus more on firm survival rather than on profitability and growth (Bandick, 2010; Van Beveren, 2007; Alvarez and Görg, 2009). Furthermore, recent literature presents controversial arguments on the performance role of MNEs in a turbulent environment (for a literature review see Varum and Rocha, 2011).

In general, this study enriches the IB and management literature by investigating how foreign ownership and domestic multinationality affect the performance of foreign-owned firms, domestic MNEs and domestic non-MNEs in the small open Greek economy, comparing the specific groups of firms in pairs. Our empirical analysis reveals the relative performance contribution of foreign ownership and domestic multinationality in the total investigation period (2002-2016). More importantly, this explores systematically the two groups of the study hypotheses and clarifies that in a deleterious economic environment foreign ownership can attenuate the adverse performance recession effects. By contrast, domestic multinationality cannot mitigate the negative effects of recession, contrary to the dominant view in the recent performance literature.

The rest of the paper is set out as follows. The next section provides the theoretical background and develops the hypotheses of the study. The following section sets out the

research method of the study. This is followed by a presentation of findings and discussion. Conclusions are in the final section.

Theoretical background and hypotheses development

Foreign ownership

The key research question on the performance role of ownership encapsulates the contrast between the advantage of foreignness and the liability of foreignness. The standard model of the multinational firm (Caves, 1996; Dunning, 1993; Hymer, 1960) predicts that foreign-owned firms possess unique income-generating assets relative to indigenous enterprises that allows them to penetrate successfully the latter's home market (advantage of foreign ownership). In this case, imitation by domestic competitors is difficult and diffusion therefore is slow. In particular, foreign units in the local market can draw on the expertise, experience and legitimacy of the parent company (Mata and Portugal, 2002). These units might become more productive and profitable if their competitive advantage relative to domestic companies exceeds their added costs of establishing and operating in the foreign country (Dunning, 1993; Caves, 1996). Such superior performance may be strengthened by the overall productivity difference between a developed parent country and a less developed small economy (Davies and Lyons, 1997). Thus, more efficient foreign firms that produce at lower marginal costs may tend to increase their output and profitability at the expense of indigenous enterprises. Additionally, the initial LOF will gradually be overcome through more information about the host country environment, better connection to local business systems and networks (Johanson and Vahlne, 1997), and more effective adjustment to the local environment (Luo and Tan, 1998). Thus, LOF is to a large extent temporary as many sources of this liability can be overcome with time (Mata and Freitas, 2012) including the foreign-owned firm's capability to acquire attractive local enterprises (Chang et al., 2013).

However, the existence of foreign ownership advantages does not necessarily guarantee a superior performance in the host country (Poulis et al., 2012; Dunning, 1993), especially in the case where foreign firms attempt to simply strengthen their market power rather than to improve the efficiency of resource allocation in the host country (Hymer, 1960;

Newfarmer, 1979; Dunning, 1993). Furthermore, positive spillover effects of foreign firms to domestic enterprises operating in the same industry via the adoption of new technologies and improved management practices might decrease the performance superiority of foreign companies. The resulting comparative performance outcome is therefore unpredictable (e.g., Bellak, 2004; Dunning, 1993 and his review of earlier literature; Mataloni, 2000 and his review of earlier literature).

Despite the ambiguous empirical findings, prior research tends to focus on strong foreign ownership-specific advantages leading to competitive supremacy of foreign-owned firms. If this is so, during recession, foreign-owned firms should be in a better position to compete than domestic enterprises and thereby be more resilient in terms of performance. Their performance status will in part depend on their ability to adjust in a deteriorating local environment (Luo and Tan, 1998; Lall, 1987). In this context, based on the strong ownership advantages of the parent company, foreign-owned firms might be able to reorient their operations and achieve a better strategic fit with the new host country environment. However, the nature of the reaction of the foreign firm may be related to its investment motivations (Varum and Rocha, 2011; Alvarez and Görg, 2009). In particular, it is argued that an economic recession would especially hit the performance of market-seeking firms as they are often deeply embedded in the local economy maintaining important linkages and networks with the main local players (Andersson et al., 2001).

In the context of the small Greek economy, domestic non-MNEs normally exhibit a relatively low level of R&D, weak international alliances with foreign firms, and family-owned characteristics that limit their competitive strength. In contrast, foreign-owned firms normally possess strong ownership-specific advantages with positive performance outcomes. With the expected significant competitive edge of foreign-owned companies, we expect that during recession years, foreign-owned firms can absorb more effectively adverse effects and hence they will perform better than the Greek non-MNEs. Thus, we hypothesize that:

Hypothesis 1a: *Over the recession period, the profit performance of foreign-owned firms located in Greece will be better than the profit performance of Greek domestic non-MNEs.*

Hypothesis 1b: *Over the recession period, the sales growth performance of foreign-owned firms located in Greece will be better than the sales growth performance of Greek domestic non-MNEs.*

Domestic multinationality

The superior performance of firms may not be an ownership advantage *per se*, but may simply reflect a multinationality advantage (Dunning, 1993; 2000). This advantage is associated with the MNE's network of affiliates (Mudambi and Navarra, 2004; Yamin and Otto, 2004; Andersson et al., 2002; Globerman et al., 1994), which might enjoy better access to foreign markets through intra-firm trade and network economies (Andersson et al., 2002), a more extensive set of information and experience (Kim et al., 2012), and better capacity for evaluating different situations (Caves, 1996). By operating in different foreign environments MNEs are able to obtain a better match than that of national non-MNEs, which may fail to identify and adopt "best practice technology" or operate at optimum size, with a negative impact on their performance (e.g., Bellak, 2004; Dunning, 1993; Globerman et al., 1994).

Nevertheless, empirical studies have offered a critical perspective on MNE performance (e.g., Contractor et al., 2003; Lu and Beamish, 2004). More specifically, some studies have shown both a U-shaped relationship and an inverted-U-shaped relationship (Ramaswamy, 1995; Gomes and Ramaswamy, 1999). A U-shaped relationship suggests an initially negative effect of international expansion on performance, before the positive returns of internationalization are realized. In turn, an inverted-U-shaped relationship indicates that internationalization beyond an optimal level is again detrimental to performance and results in a negative slope. More recently empirical studies, such as that of Contractor et al. (2003), have postulated a so-called "three-stage" theory based on a sigmoid model that integrates the two aforementioned concepts showing that multinationality and performance have initially a negative, then a positive and finally a negative relationship. To be more precise, early internationalizers (stage 1) might endure large initial learning costs. In mid-stage internationalization (stage 2), further foreign expansion makes possible efficiencies, decreases liability of foreignness and gives the opportunity to spread fixed costs over more host countries. At the late internationalization stage (stage 3), an 'over-internationalization'

reflected in a further expansion into peripheral or small markets causes a net, or incremental, negative effect on performance as coordination and governance costs increase faster than incremental revenues. This becomes more critical especially for MNEs from small or emerging economies as their ability to learn effectively from international operations may be eroded when operating as a newcomer in dissimilar cultures (Zeng et al., 2013). Thus, the sigmoidal relationship between multinationality and performance suggests that both insufficient and excessive levels of multinationality are negatively related to financial performance (Contractor et al, 2003; Ruigrok et al., 2007; Powell, 2014). We explicitly focus on early internationalizers since this reflects the internationalization state of the Greek MNEs.

As regards performance during a recession, internationally engaged firms that are characterized by geographically diversified profiles will have better prospects of withstanding negative economic shocks (Varum and Rocha, 2011) or even expanding in turbulent periods (Chung and Beamish, 2005) as compared to purely indigenous firms that are much more exposed to the home country's adverse conditions. However, it appears inevitable that early internationalizers, especially from smaller economies such as Greece, will face a high administrative overhead fixed cost per host country due to insufficient scale of global operations (only being present in a handful of host countries), and high LOF effects because of unfamiliarity with new foreign markets, cultures and environments resulting in a diminution in performance.

This discussion sets out the framework for understanding some critical points of the competitive strength of Greek MNEs. In the particular Greek context, in recent decades several domestic firms have upgraded their capabilities and accelerated their catch-up attempts (correspondingly for India, see Lamin and Livanis, 2013) to compensate for losses in local market share caused by increased import competition in the integrated European markets. These domestic MNEs, as early internationalizers, originating from a less developed small economy, and mainly possessing relatively weak ownership-specific advantages in an institutionally vulnerable environment, have searched for foreign locations mostly in neighboring countries (e.g. Balkan States). However, these firms have normally faced high initial learning costs and high operational risk due to foreign market inexperience that undermines performance. Although there is no unambiguous insight into the effect of multinationality during recession, in the case of Greek MNEs, their relatively low level of

multinationality provides a strong indication that they will be unable to face adverse crisis effects and therefore they will not perform better than domestic non-MNEs during recession years. Consequently, adopting the above skepticism on the *a priori* benefits of multinationality, especially of firms from small economies, we adopt the premise of the most recent literature as regards multinationality risk at the early internationalization stage of domestic MNEs and hypothesize that:

Hypothesis 2a: *Over the recession period, the profit performance of Greek domestic MNEs will not be better than the profit performance of Greek domestic non-MNEs.*

Hypothesis 2b: *Over the recession period, the sales growth performance of Greek domestic MNEs will not be better than the sales growth performance of Greek domestic non-MNEs.*

Research Methods

Research context

This study focuses on the Greek economy during the 2002-2016 period, a time during which the country was a member of the Eurozone. The Greek economy, as with the other countries of Southern Europe, was badly affected by the economic recession, which began in 2008. In particular, as a result of a drastic reduction in aggregate demand, the Greek Gross Domestic Product (GDP) cumulatively declined by more than 25%, and the deindustrialization process intensified with the share of manufacturing in GDP falling to 15%, the lowest level in the postwar period (UNCTAD statistics). The adverse macroeconomic environment affected several industries. Greater competition from imports, which increased enormously, led to a sharp decline in the market shares of domestic firms and significant reduction in their profit rates, with many firms going out of business. Overall, the central consequence has been a considerable negative impact on the performance of firms. This raises the important question as to whether the adverse recession effects are symmetrical across the three groups of companies that we investigate.

An examination of the study's research questions in the context of Greece experiencing extremely adverse conditions in its real economy is most appropriate for our research purposes, not least, as we can follow the performance evolution of different groups of enterprises in the same setting. Our data enable us to compare two contrasting periods, the first period (2002-2007) is a growth period, while the second period (2008-2016) includes the beginning and the escalation of the economic recession.

Data

The data used in this study is drawn from the comprehensive database of ICAP Hellas, which includes systematic financial and non-financial information on all manufacturing companies operating in Greece. We use a matched sample methodology (see Kronborg and Thomsen, 2009; Mata and Portugal, 2002; Dunning, 1993). More specifically, we match foreign-owned enterprises with domestic non-MNEs (H1a and H1b) and domestic non-MNEs with domestic MNEs (H2a and H2b) respectively, that exhibit as much as possible similar characteristics with the foreign units. The sampling design is as follows. First, we identified all foreign-owned companies in the database of ICAP Hellas. Second, we explicitly focused on those companies with a minimum labour force of 50 (according to the 2003/361 size-based classification of the European Commission, thus excluding very small and small companies) and a foreign participation in their share capital of over 50% unchanged over time. In this way, we concentrated on the critical mass of foreign units operating in the country during the total investigation period. Third, from the domestic population we randomly selected Greek firms according to the aforementioned firm size criterion in order to form the two corresponding control subsamples of Greek non-MNEs and Greek MNEs that were as similar as possible to the group of foreign-owned companies. Also, to avoid performance differences because of differentiated industry effects, we selected Greek firms with very comparable industry features. Thus, we ensured the same industry representation for each group of firms, since foreign-owned firms may be attracted to more productive industries characterized by economies of scale and scope (Kronborg and Thomsen, 2009; Temouri et al., 2008; Caves, 1996). The sampling outcome was that the Greek sample firms (both MNEs and non-MNEs) came closest to the foreign company by industry. Hence, we identified 80 triads of firms, i.e.

240 firms in total and 3600 observations (15 years x 240 firms = 3600 observations), classified into the following categories:

- 80 foreign-owned firms in which foreign owners possess more than 50% of the shares,
- 80 domestic MNEs, which are domestically owned but are part of an enterprise group with affiliates abroad,
- 80 domestic non-MNEs (national firms), which are domestically owned with no foreign affiliates.

Given the small scale of the Greek economy and its structural peculiarity these 240 sample firms constitute the core of the domestic manufacturing sector (very small and small enterprises represent about 99% of the total manufacturing population, according to the Hellenic Statistical Authority, which is an autonomous legal entity under public law, independent from the Greek Government, and used by Eurostat and other international organizations).

Table 1 presents a breakdown of the sample firms by industry. Chemical products and machinery/electrical appliances manufacturers are the most numerous. The number of transportation/shipping firms is minimal. This is because Greek shipping firms have a dominant position in the transportation services sector (mainly overseas activities) and not in the shipbuilding industry. Generally, the sample firms reveal a relatively high concentration, at a level of about 80%, in eight industry groups, that is, foods, beverages, textiles, clothing/leather, chemical products, rubber products and plastics, primary metals/metal products, and machinery/electrical appliances. Their industrial concentration pattern is very similar to that of the total manufacturing sector (according to the Hellenic Statistical Authority) since the same industries tend to reach the same level of concentration (almost 80%) within the whole of manufacturing. Finally, it is worth noting that the origin of the foreign-owned sample firms lies primarily in Central and Northern Europe. In addition, the selected domestic MNEs are well-established in at least three foreign markets, whereas all total assets of the Greek non-MNEs are inevitably focused on the local market and their activity explicitly has national features.

The processing of the data took place with the statistical package EViews.

[Insert Table 1 here]

Dependent variables

We use financial indicators as dependent variables to show whether and to what degree the recession period has affected relative firm performance. Many prior studies have utilized financial variables as the main measure of firm performance (for example, Kotabe et al., 2002; Contractor et al., 2003; Powell, 2014) since they are reasonably sensitive to economic change and capture the impact of change during a relatively short period of time as in the case of this study. Two profitability indices and a sales growth index are explored as dependent variables in order to draw conclusions about the evolution of business performance over a fifteen-year period. More specifically, the dependent variables are return on equity (ROE), measured as the share (%) of net income before taxes to equity; return on assets (ROA) calculated as the share (%) of net income before interest and taxes to total capital employed; and sales growth (SALESGROW), which refers to the annual increase in sales, captured through $(S_{t+1} - S_t) / S_t$, where S_{t+1} is the sales of the observation year and S_t the sales of the previous year. We used standardized measures for the three dependent variables (subtracting the mean value and dividing by the standard deviation).

Explanatory variables

The variable OWNER distinguishes between foreign-owned and domestic non-MNEs, and takes the value of one for foreign-owned firms and zero for domestic non-MNEs. In the related literature, it is common to capture foreign ownership through a binary variable (e.g., Alvarez and Görg, 2009; Varum and Rocha, 2011; Godart et al., 2012). The overall effect of foreign ownership on performance is expected to be positive (positive sign).

The variable MULTI captures foreign operations of Greek firms and takes the value of one for domestic MNEs and zero for domestic non-MNEs. Some prior studies (e.g., Kotabe et al., 2002; Contractor et al., 2003) have used a continuous variable such as foreign sales to total sales, foreign income to total income, etc., as they focus only on multinationality. However, when comparing different business groups, a binary variable offers an effective way to distinguish them clearly (see also Temouri et al., 2008; Bandick,

2010). The total performance impact of multinationality is expected to be negative (negative sign) or statistically insignificant.

We capture recession effects through the binary variable CRISIS (see Varumand Rocha, 2011), which takes the value of 1 for the period of recession (2008-2016) and zero for the growth period (2002-2007). The overall performance effect of the recession is expected to be negative (negative sign) (e.g., Varum and Rocha, 2011; Godart et al., 2012). However, as the CRISIS dummy may be considered too crude a measurement, we also use the continuous variable GDPC, which measures the annual percentage change of real GDP per capita in U.S. \$ (source: UNCTAD, statistics). It should be noted that GDP is the monetary value of all the finished goods and services produced within the country's borders in a year. GDP per capita is calculated by dividing GDP by the number of the population. The data were transformed into constant values using 2010 as the base year. We expect a linear relationship between GDPC and firm performance, that is, a positive trend of GDPC (expansion period) favours performance, whereas a negative trend (recession period) undermines performance. Thus, we expect that the coefficient will be positive and significant.

We evaluate the performance impact of foreign ownership and domestic multinationality in the recession period and test our two groups of research hypotheses as follows. We utilize the main variables of interest in terms of the interaction terms OWNER X CRISIS (Varum and Rocha, 2011; Godart et al., 2012) and OWNER x GDPC, testing for hypotheses 1a and 1b, as well as MULTI X CRISIS and MULTI x GDPC, testing for hypotheses 2a and 2b.

Control variables

We introduce five control variables, including four firm-specific control variables. The variable AGE measured from the difference between the 'last year of observation (2016) minus the year of establishment', indicates firm age and acts as a proxy for the experience of the firm in the local market (e.g. Varum and Rocha, 2011; Godart et al., 2012; Alvarez and Görg, 2009; Demirbag et al., 2008; Dunne and Hughes, 1994). We expect AGE to be positively related to firm performance. When first entering a foreign market a firm may have high start-up costs due to a number of uncertainties or inefficiencies, for example, problems in organizing factor inputs and in obtaining material inputs, operating with a small plant size,

low capital intensity, etc., while well-established firms are unlikely to suffer such problems and so may achieve a greater profit level (Bloningen and Tomin, 2001). The variable LABOR is an indicator of labour productivity (e.g., Varum and Rocha, 2011; Bandick, 2010) measured as the ratio of turnover/employment (Varum and Rocha, 2011). Turnover refers to annual sales and employment measures the average number of employees in the respective year. The data were transformed into constant values using 2010 as the base year. Labour productivity normally increases when firms substitute capital for labour by using more capital intensive methods (Varum and Rocha, 2011; Alvarez and Görg, 2009). This has been the case in Greece in recent years as labour costs rose substantially, especially before the recession. The variable is expected to have a positive impact on performance. The variable EXPO, as an indicator for export orientation, is a continuous variable that captures the share (%) of export sales in total sales of a firm and examines whether performance differences depend on export tendency. It is likely that exporters have a more diversified sales profile and hence may be more resilient to external shocks (Varum and Rocha, 2011; Bandick, 2010; Alvarez and Görg, 2009). There are various options as regards the measurement of firm SIZE, such as total assets and number of employees. The use of total assets is likely to favour capital-intensive firms and might discriminate against labour-intensive units and *vice versa*. In recent decades, as the Greek economy lost its international competitive advantage in labour-intensive industries, local firms replaced unskilled labour with capital and became much more capital intensive in nature. We therefore capture firm size through the number of employees (average of each year), similar to other relevant performance studies (e.g., Bandick, 2010; Varum and Rocha, 2011; Georgopoulos et al., 2014). The variable SIZE is measured as the log of the number of employees and tests the impact of economies of scale on performance, which frequently has an ambiguous impact on firm performance (Varum and Rocha, 2011; Godart et al., 2012; Alvarez and Görg, 2009; Dunne and Hughes, 1994). The industry-specific variable OPEN is defined as the sum of the import penetration ratio (%), $(\text{Imports} / \text{Domestic Production} + \text{Imports} - \text{Exports})$, and the export orientation ratio (%), $(\text{Exports} / \text{Domestic Production})$, for each industry. The data are derived from the Hellenic Statistical Authority. OPEN as a continuous variable varies from year to year, but is the same for those firms included in the same industry. The variable captures the increase of international competition in the domestic market, which has increased substantially in the Greek economy during the European integration era, especially in the Euro membership

period. Intensified competition might increase the likelihood of a deterioration of performance of the least efficient firms (Colantone and Sleuwaegen, 2010). However, Wagner and Gelübcke (2012) suggest that openness might increase firm survival and probably performance due to efficiency considerations. Thus, this variable may have an ambiguous impact on firm performance.

Models

In order to investigate the study's hypotheses, we develop four models:

Model 1 (Table 4 and Table 6, column 1) consists of the explanatory variables OWNER, CRISIS, and GDPC, the five control variables EXPO, AGE, LABOR, SIZE, and OPEN, as well as the interaction term OWNER x CRISIS, for testing the first group of hypotheses regarding foreign ownership. The specific model is as follows:

$$Y = \alpha_i + X'_{it}\gamma + \beta_1\text{OWNER}_{it} + \beta_2\text{CRISIS}_{it} + \beta_3\text{GDPC}_{it} + \beta_4(\text{OWNER} \times \text{CRISIS})_{it} + \varepsilon_{it} \quad (1)$$

where Y is the proxy for performance of firm i in each time period, corresponding to ROE in a first specification, to ROA in a second specification, and to sales growth in a third specification. X is a vector of firm- and industry specific characteristics. The equation evaluates the performance impact of being foreign owned during recession years through an interaction term OWNER x CRISIS. If foreign-owned firms are more able to handle recession effects, their performance (i.e., profitability and sales growth) should be higher than for domestic non-MNEs in the recession period, and in that case, the coefficient β_4 will be positive and significant (see also Varum and Rocha, 2011). This means that Hypotheses 1a and 1b will be supported. If β_4 is negative and significant, then foreign-owned firms would exhibit a performance disadvantage as compared to domestic non-MNEs, whereas if β_4 is zero or non-significant, this indicates a similar performance outcome as regards the two groups of firms under investigation.

Model 2 (Table 4 and Table 6, column 2) contains the explanatory variables MULTI, CRISIS, and GDPC, the five control variables EXPO, AGE, LABOR, SIZE, and OPEN, as well as the interaction term MULTI x CRISIS, for testing the second group of hypotheses concerning domestic multinationality. The specific model is as follows:

$$Y = \alpha_i + X'_{it}\gamma + \beta_1\text{MULTI}_{it} + \beta_2\text{CRISIS}_{it} + \beta_3\text{GDPC}_{it} + \beta_4(\text{MULTI} \times \text{CRISIS})_{it} + \varepsilon_{it} \quad (2)$$

where Y is the proxy for performance of firm i in each time period, corresponding to ROE in a first specification, to ROA in a second specification, and to sales growth in a third specification. X is a vector of firm- and industry specific characteristics. The equation assesses the performance impact of domestic multinationality during recession via an interaction term $\text{MULTI} \times \text{CRISIS}$. Hypotheses 2a and 2b will be supported if either the coefficient β_4 of $\text{MULTI} \times \text{CRISIS}$ is negative and significant (i.e., Greek MNEs perform worse than Greek non-MNEs), or the coefficient β_4 is not significant (i.e., there is no statistically significant performance difference between the two groups of firms). Hypotheses 2a and 2b will not be supported if the coefficient β_4 is positive and significant, as this would indicate Greek MNEs perform better than Greek non-MNEs during the recession.

Model 3 (Table 4 and Table 6, column 3) includes the explanatory variables OWNER , MULTI , CRISIS , and GDPC , the five control variables EXPO , AGE , LABOR , SIZE , and OPEN , as well as the interaction terms $\text{OWNER} \times \text{CRISIS}$ and $\text{MULTI} \times \text{CRISIS}$, in order to test both groups of hypotheses. More specifically, we extend our model, integrating both interaction terms in the same estimation in order to obtain the full picture as regards the impact of the two explanatory variables on performance during the recession. The specific model is as follows:

$$Y = \alpha_i + X'_{it}\gamma + \beta_1\text{OWNER}_{it} + \beta_2\text{MULTI}_{it} + \beta_3\text{CRISIS}_{it} + \beta_4\text{GDPC}_{it} + \beta_5(\text{OWNER} \times \text{CRISIS})_{it} + \beta_6(\text{MULTI} \times \text{CRISIS})_{it} + \varepsilon_{it} \quad (3)$$

where Y is the proxy for performance of firm i in each time period, corresponding to ROE in a first specification, to ROA in a second specification, and to sales growth in a third specification. X is a vector of firm- and industry specific characteristics.

Model 4 (Table 5 and Table 7) includes the three explanatory variables OWNER , MULTI , and GDPC , the control variables, as well as the interaction terms $\text{OWNER} \times \text{GDPC}$ and $\text{MULTI} \times \text{GDPC}$. In particular, we incorporate the variable GDPC , instead of CRISIS , in the interaction terms. GDPC is a continuous variable, whereas CRISIS is a binary variable, and this provides a different way of capturing recession effects. The specific model is as follows:

$$Y = \alpha_i + X'_{it}\gamma + \beta_1 \text{OWNER}_{it} + \beta_2 \text{MULTI}_{it} + \beta_3 \text{GDPC}_{it} + \beta_4 (\text{OWNER} \times \text{GDPC})_{it} + \beta_5 (\text{MULTI} \times \text{GDPC})_{it} + \varepsilon_{it} \quad (4)$$

where Y is the proxy for performance of firm i in each time period, corresponding to ROE in a first specification, to ROA in a second specification, and to sales growth in a third specification. X is a vector of firm- and industry specific characteristics. The overall effect of the GDPC is given by β_3 which is expected to be positive indicating a linear relationship between growth of GDPC and firm performance, i.e., a positive trend of GDPC favors performance (expansion period), whereas a negative trend undermines performance (recession period). Further, the equation evaluates the impact of being-foreign owned on GDPC through an interaction term OWNER x GDPC in the expansion period and the recession period respectively. Similarly, the regression equation evaluates the impact of being domestic multinational via an interaction term MULTI x GDPC in both periods. In the expansion period, we expect that the coefficient β_4 of the term OWNER x GDPC will be positive and statistically significant, whereas in the recession period this will become negative due to potential positive effect of foreign ownership on performance. In turn, the coefficient β_5 of the term MULTI x GDPC will be statistically insignificant in the expansion period, and positive and statistically significant during the recession period because of the weak performance effect of domestic multinationality. Hence, we expect that domestic multinationality will not compensate the negative performance effects of recession.

We apply panel data models to estimate all the above equations. In order to choose between random and fixed effects we conducted a Hausman test. For all of the estimations the Hausman test accepts the hypothesis of null covariance between the regressors and the individual effects. Thus, random effect estimators are the most appropriate, being unbiased and consistent (see the opposite situation in the study of Varum and Rocha, 2011, p. 53).

Empirical analysis

Descriptive statistics

Descriptive statistics are shown in Tables 2 and 3. Table 2 concerns the independent variables (no dummies) and indicates an average GDPC of \$25285, a relatively low export orientation

(mean 28%), a relatively high firm maturity (average age 38 years), labour productivity of over €50000 turnover per employee, an average firm size of 197 employees, and an average openness almost at the 80% level. Table 2 shows that the correlation coefficients are very low, with no Pearson coefficients greater than 0.23, indicating that multicollinearity is not a problem.

Table 3 is based on paired samples-t-test (two-tailed) and exhibits significant differences in many dependent and independent variables between the following groups of enterprises: foreign-owned firms vs. Greek MNEs (column 1), foreign-owned firms vs. Greek non-MNEs (column 2), Greek MNEs vs. Greek non-MNEs (column 3). As regards the dependent variables, the most important differences refer to ROE and ROA in columns 1 and 2, showing that the foreign-owned firms substantially outperform the other two groups respectively. However, there are no significant differences in the performance between Greek MNEs and Greek non-MNEs except for the variable ROA (column 3). Concerning the independent variables, the most notable differences between the foreign-owned firms and the other two groups are in the variables AGE and OPEN, showing that foreign enterprises are on average older with a lesser degree of openness than the others.

[Insert Table 2 here]

[Insert Table 3 here]

The evolution of each performance index, comparing the three types of firms, is shown in Figures 1 to 3. Figure 1 indicates that ROE of all sample firms declined over the recession years and that foreign-owned enterprises enjoyed a profitability advantage. Figure 2 shows that the performance variable ROA has behaved in a similar manner to the ROE variable. The aforementioned figures indicate that the impact of domestic multinationality on firm performance in terms of profitability is low. Figure 3 presents the annual turnover percentage change by firm group and indicates a more stable turnover evolution of the foreign-owned firms, with a slight superiority in the recession period, as compared to others, especially for Greek non-MNEs that are characterized by volatility. In summary, it appears that the main portion of the performance gap across the different firm groups can be explained by the foreign ownership effect, but not by the domestic multinationality effect. In addition, the findings indicate a much greater performance similarity between Greek MNEs and Greek non-MNEs than to foreign-owned firms. To sum up, there is an indication that the

foreign-owned firms have been able to attenuate the negative performance effects of recession more than the two categories of the Greek firms.

[Insert Figures 1, 2, 3 here]

Regression results

The econometric findings of the first three models are shown in Table 4, with the p-values in parentheses. We present the results for each dependent variable in three columns as follows. Column 1 (Model 1) contains the performance effect of the explanatory variables OWNER, CRISIS, and GDPC, the five control variables EXPO, AGE, LABOR, SIZE, and OPEN, and the interaction term OWNER x CRISIS, testing H1a and H1b. Column 2 (Model 2) includes the explanatory variables MULTI, CRISIS, and GDPC, the same control variables and the interaction term MULTI x CRISIS, testing test for H2a and H2b. Column 3 (Model 3) comprises the explanatory variables OWNER, MULTI, CRISIS, and GDPC, the five control variables and both interaction terms, that is OWNER x CRISIS and MULTI x CRISIS, testing for both groups of hypotheses.

The findings show that recession (CRISIS) has negatively affected the profitability and sales growth performance; this finding is statistically significant at the 1% level with a negative sign in all models. At the same time, the change of the GDP growth rate (GDPC) has a similar performance impact (significance of 1% in all models with a positive sign) indicating a linear relationship between GDPC and firm performance reflected in a positive performance effect in the expansion and a respective negative effect in the recession. The overall effect of foreign ownership (OWNER) on profitability (ROE and ROA) is positive and statistically significant ($p < 0.01$), as it is on sales growth ($p < 0.05$, Models 1 and 3). In line with the suggestion in the literature of an ambiguous relationship between domestic multinationality and performance, we find that domestic multinationality in terms of early internationalization does not exercise any noteworthy influence on performance in all models (Model 2 and 3).

Next, we focus on the hypotheses of the study. The interaction term OWNER x CRISIS (Models 1 and 3) is positive and significant ($p < 0.05$ and $p < 0.10$) in terms of ROE and ROA. This finding supports H1a and indicates that during the recession foreign-owned firms

exhibit a higher profit performance than domestic non-MNEs. In the same models (1 and 3) the interaction term OWNER x CRISIS is positive and significant ($p < 0.01$) in the case of sales growth. This finding clearly supports hypothesis H1b, denoting that the sales growth performance of foreign-owned firms located in Greece is much better than the sales growth performance of Greek domestic non-MNEs. This indicates that foreign ownership has acted as a stabilizing effect as regards sales evolution, considerably serving to decrease the volatility of sales in the recession years. Comparing the performance outcomes of foreign ownership, we conclude that foreign ownership exercises a more positive influence on sales growth than profitability during the recession. In turn, the interaction term MULTI x CRISIS (Models 2 and 3) is statistically significant ($p < 0.01$) with a negative sign in all three dependent variables. This indicates that over the recession domestic MNEs do not exhibit a performance advantage in relation to domestic non-MNEs, regardless of the performance measure (i.e., either profit performance or sales growth performance). These findings strongly support H2a and H2b.

With regard to the control variables, we observe that almost all of them play an insignificant role in firm profitability (ROE, ROA) although EXPO is significant in the case of ROA, Model 1 ($p < 0.10$). In all models the specific variable has a negative sign indicating that a high export trend is negatively correlated with performance, and suggesting that export-oriented firms may face serious competition problems in foreign markets. As regards SALESGROWTH, three control variables, AGE, LABOR, and SIZE, are statistically significant, thus revealing an increasing impact of the variables on sales growth as compared to profitability. In particular, AGE is significant ($p < 0.01$) with a positive sign of the coefficients revealing that relatively mature firms outperform others. Labour productivity (LABOR) is statistically significant with a positive sign ($p < 0.01$) showing that highly productive firms perform better in terms of sales growth than others. In turn, firm size (SIZE) is significant with a positive sign ($p < 0.05$) suggesting that larger firms might exhibit a more positive trend in their sales evolution as compared to others. Finally, OPEN is statistically not significant in all cases.

[Insert Table 4 here]

Next, we proceed with the findings of Model 4, shown in Table 5, with p-values in parentheses. The results demonstrate that in both economic periods ownership by foreigners (OWNER) exercises a positive and statistically significant impact ($p < 0.1$) on the three performance variables. The variable of GDP per capita (GDPC), in the expansion period, does not influence profitability but clearly strengthens sales growth. In turn, in the recession, GDPC negatively affects all performance indices (statistically significant with a positive sign). From the interaction term OWNER x GDPC we obtain two important findings. In the expansion period foreign ownership enables the corresponding companies to capitalize more profitability gains in relation to domestic enterprises ($p < 0.05$); the same applies to a lesser extent for the sales growth parameter ($p < 0.10$). In turn, in the period of downturn foreign ownership clearly contributes to a more smooth evolution of sales growth ($p < 0.01$) and to a certain reversal of adverse recession effects on profitability ($p < 0.10$). The findings support Hypotheses 1a and 1b. The variable MULTI has no influence on the profitability variables in both economic periods, while this parameter negatively influences SALESGROW in the recession. Moreover, based on the interaction term MULTI x GDPC we cannot conclude any positive effect in the performance variables either in the expansion or in the recession. On the whole, these results strongly support Hypothesis 2a and 2b.

As regards the control variables there are many similarities between Model 4 and the first three models (Table 5). The variable LABOR productivity exercises a positive effect on the indicator of SALESGROW in both of the economic periods we examine ($p < 0.01$ and $p < 0.10$ respectively). Larger firms (SIZE) demonstrate a higher sales rate in the recession years ($p < 0.05$). In addition, more mature firms (AGE) clearly exhibit higher growth rates both in the expansion and the recession years ($p < 0.01$ and $p < 0.05$). The impact of export orientation (EXPO) and openness (OPEN) on performance is not significant and with a negative sign in almost all cases, indicating that international competition seems not to favour performance.

[Insert Table 5 here]

Robustness test

In order to increase the reliability of the econometric findings, we extended our sample and tested the models again. We removed the two data limitations on the foreign-owned firms

(see data section) and incorporated in the sample foreign units with a labour force less than 50 (smaller firms) and minority joint-ventures with a minimum participation of foreign capital of 30%. We identified 48 of these units that were operating during the whole investigation period in Greece, hence the sample of the foreign-owned companies increased from 80 to 128 units. Subsequently, we followed exactly the same sampling process and selected randomly 48 new Greek non-MNEs and 48 new Greek MNEs according to the aforementioned firm size criterion (smaller firms) and with the same industry representation. Hence, we created 128 triads of firms, that is 384 firms in total and 5760 observations (15 years x 384 firms = 5760 observations).

The econometric findings of Models 1 to 3 are shown in Table 6 (with the p-values in parentheses) in the same way as in Table 4. We conclude that the new findings are qualitatively similar to the previous results. In particular, we find that foreign ownership generally strengthens performance both in terms of profitability ($p < 0.01$) and sales growth ($p < 0.10$). The overall performance effect of the domestic multinationality factor is either insignificant and negative (profitability) or significant ($p < 0.10$) but with a negative sign in the case of sales growth. Recession (CRISIS and GDPC variables) has an adverse performance impact in all models ($p < 0.01$) as expected. The interaction terms confirm our respective hypotheses. In particular, the coefficient of OWNER x CRISIS is statistically significant and positive ($p < 0.01$ in the case of sales growth, and in the case of profitability $p < 0.05$ and $p < 0.10$). This means that during recession years foreign-owned firms show a performance advantage as compared to Greek non-MNEs. By contrast, the coefficient of MULTI x CRISIS is statistically significant ($p < 0.01$), with a negative sign in all cases. The finding indicates that domestic MNEs do not achieve better performance compared to Greek non-MNEs over the recession period.

As regards the control variables, EXPO has a negative impact on ROA in Models 1 and 2 ($p < 0.10$), whereas LABOR ($p < 0.01$), SIZE ($p < 0.05$) and AGE ($p < 0.10$; Model 2) exercise a positive influence on SALES GROWTH.

[Insert Table 6 here]

Finally, we estimate Model 4 again on the extended sample for both the expansion period and the recession period (Table 7). The results are qualitatively similar to the previous results presented in Table 5, further supporting our hypotheses.

[Insert Table 7 here]

To sum up, all findings (Tables 4 to 7) strongly confirm our research hypotheses, albeit with a varying degree of statistical significance. This means that during recession, foreign-owned firms achieve better performance than Greek non-MNEs, although their relative sales growth performance is greater than profit performance. In turn, domestic MNEs do not successfully absorb recession effects and so do not outperform domestic non-MNEs, either in terms of profitability or in terms of sales growth. The results on the control variables reveal a positive impact of firm age, labour productivity, and firm size on sales growth, and an insignificant impact of export orientation and openness on return on assets, although with some small variation across the models.

Discussion

This paper contributes new elements to the literature on firm performance, linking performance differences with firm heterogeneity. In addition, we respond to the call for empirical examination of the performance impact of radical environmental change in terms of LOL (Keister, 2002; Perez-Batres and Eden, 2008), and integrate in our models effects of the recent economic recession (2008-2016) in the Greek economy. The findings from a sample of three heterogeneous groups of firms operating in the domestic economy over the 2002-2016 period support the study's hypotheses, and provides notable implications for researchers, managers and policy makers alike.

Theoretical contribution

This study postulated different performance outcomes among three groups of firms (i.e. foreign-owned firms, Greek MNEs and Greek non-MNEs), examining the performance role of foreign ownership and domestic multinationality, through the use of profitability and sales

growth measures, especially under adverse conditions. The revealed profitability differences are found to be mainly attributed to the ownership factor, as foreign-owned firms were clearly more profitable than Greek non-MNES throughout the period under study. From the perspective of foreign-owned companies, this indicates a relatively weak LOF effect in the economy and seems to be in line with the industrial organization tradition (e.g., Hymer, 1960) which claims that information costs about a local market are primarily a fixed cost, occurring at the early market entry stage, while later local adaptation effects are expected to be relatively strong. The core argument in favour of foreign profitability superiority primarily derives from the standard MNE model, suggesting that foreign ownership not only offers a particularly good initial position in the local market (hence overcoming the LOF), but also provides a good basis for establishing an advanced competitive position in the long run. Our finding supports other studies (Bellak and Pfaffermayr, 2002; Chang et al., 2013; Dunning, 1993; Kumar, 1990; Willmore, 1986) indicating systematic superior profitability of foreign-controlled firms in relation to domestic enterprises.

The study found that the sales growth of the sample domestic non-MNEs was sometimes at a higher level but much more volatile as compared to the smoother sales growth of foreign-owned companies. This finding is in accordance with a similar study of Portugal by Varum and Rocha (2011). In general, the study's findings indicate that the foreign-owned and the Greek sample non-MNEs potentially belong to different strategic groups, hence supporting Kumar (1990) for India, but not Godart et al. (2012) for Ireland.

Focusing exclusively on the multinationality factor, we observe that domestic multinationality does not positively influence firm performance in terms of either profitability or sales growth. This result is somewhat counterintuitive and contradicts the predominant perception of "the more internationalization, the better", but adds support to literature (e.g. Contractor et al., 2003) that suggests an initially negative performance effect of international expansion. Our study clearly indicates that the catch-up efforts of Greek multinationals are still incomplete, since as early internationalizers they have not yet reached the optimal multinationality level, so experiencing relatively poor economic results. This finding largely supports recent literature as many IB scholars cast doubt on the theoretical ground for a multinationality – performance relationship (e.g. Contractor et al., 2003; Lu and Beamish,

2004; Verbeke and Brugman, 2009; Powell, 2014). Hence, it should be emphasized that neither domestic ownership nor domestic multinationality can boost firm performance.

The study provides new theoretical insights as regards performance effects under unfavourable economic conditions. Our findings confirmed the study's hypotheses that exclusively refer to the economic downturn. In particular, foreign-owned firms located in Greece outperform domestic non-MNEs during the recession period both in terms of sales growth and in terms of profitability. By contrast, domestic MNEs do not display better performance than domestic non-MNEs regardless of the performance index.

Managerial implications

Our findings have several practical implications for managers. As heterogeneous ownership structures may lead to different strategic groups of firms within a national economy, managers of each group should act accordingly to locate advantages and disadvantages of rival business groups and evaluate the chances of successful governance by moving from one business group to another.

Managers of foreign units should recognize that the sustained profitability advantage and the more stabilizing performance impact of foreign ownership during recession periods (as compared to the Greek firms) might increase their bargaining power in relation to economic policy makers. In addition, managers should know that in recessions foreign ownership might have a more positive impact on sales growth than profitability, probably because the latter is more vulnerable to environmental change and more short-term oriented.

In turn, managers of domestic MNEs should take into account that internationalization strategy does not *a priori* mean better performance, as indigenous firms might have inherent disadvantages in terms of a relatively limited internationalization activity, low networking economies within the MNE group, etc. These seem to be typical characteristics for early internationalizers from emerging or small economies, with unsatisfactory performance outcomes. So, their top management should be able to determine the optimal level of multinationality given that insufficient levels negatively impact performance (Powell, 2014). However, in attempting to reach the optimal level, further international expansion might

encounter important limitations in technological and marketing capabilities, which moderate the economic success (e.g., Kotabe et al., 2002), while expanding into dissimilar cultures could cause an increase of the LOF effect (Zeng et al., 2013). Therefore, domestic MNEs should adopt the suggestion of Zeng et al. (2013) that they establish mechanisms to mitigate incorrect learning and reexamine the correctness of inferences drawn from past experience before applying them. Accordingly, domestic MNEs need particular multicultural management skills for further international expansion.

Limitations and opportunities for further research

A limitation of this study is its focus on the contextual conditions of the relatively small Greek economy. However, this setting is not unique since Greece is very similar to other peripheral European countries which were also strongly affected by the recession. Nevertheless, a comparative study would shed new light in future research.

We hope our study will provoke further debate on the topic and will motivate future research to address new aspects of the performance gaps across different strategic groups of firms. In particular, future research is needed to highlight the performance role of new multinationals from emerging or small economies as well as their stabilizing role within the economy. From this perspective, given that our study focuses on profitability and sales growth performance, further exploration of the possible performance effects by utilizing multiple and heterogeneous measures of performance would be useful (Trudgen and Freeman, 2014). Moreover, future studies could take into account more systematically the distinction between profitability and growth in order to locate further differences or similarities as regards their function as dependent variables in performance research. It would also be fruitful to utilize more finely grained measures of key independent variables, such as ownership and multinationality, rather than relying on dummy measures. Further research would be augmented through adopting other explanatory variables, such as firm-specific advantages (e.g., technology intensity, product differentiation), as insights from internalization theory indicates that performance depends on the crucial specific advantages of the firm itself and not on its multinationality *per se* (Verbeke and Brugman, 2009).

Conclusions

The study's main contribution is in addressing comparative performance dynamics in an extremely turbulent period, which is a relatively underexplored topic. The main findings support performance differences due to different ownership. They are also in contrast to the dominant view in the recent literature (e.g., Temouri et al., 2008) that multinationality *per se* is a positive performance factor. Further, the study revealed that under adverse economic conditions foreign ownership can be seen as a robust factor for growth stabilization in terms of sales and a neutralization factor as regards adverse profitability effects. Hence, the study offers critical perspectives on the performance effect of foreign ownership and domestic multinationality during a turbulent economic period.

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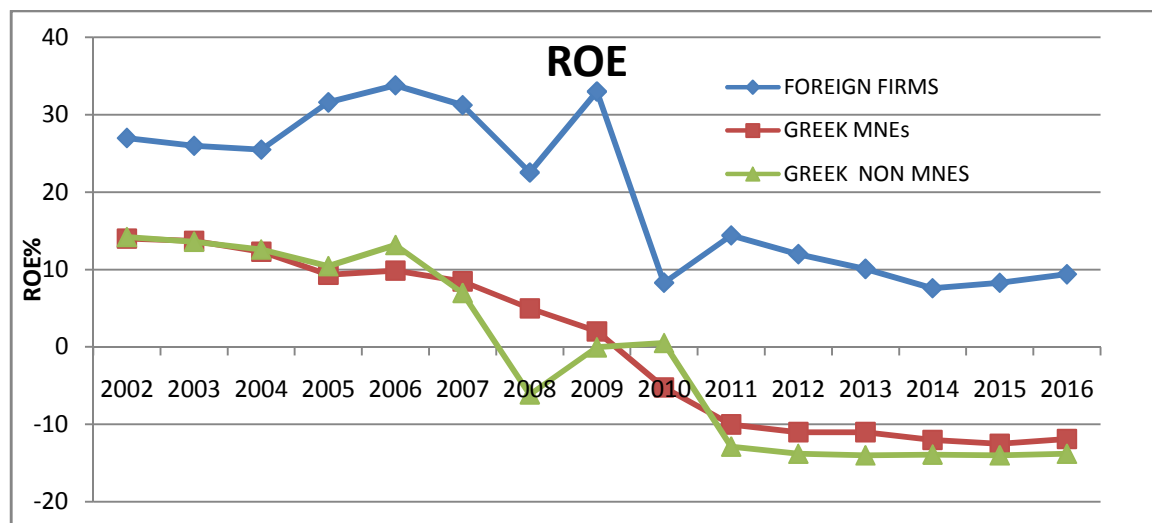
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Figure 1

Return on Equity (ROE)

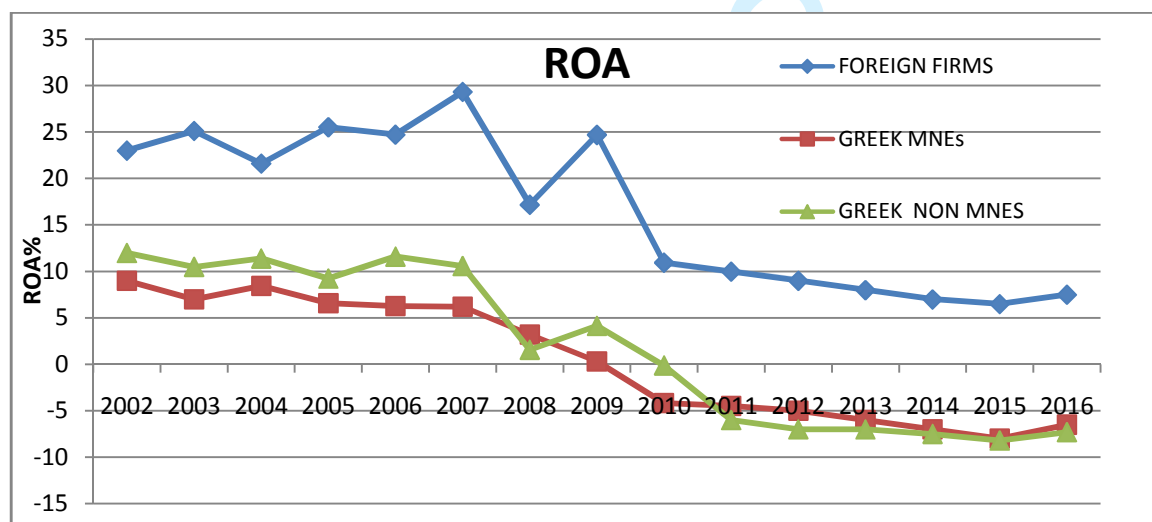


Foreign firms are subsidiaries of foreign MNEs located in Greece

2016: preliminary data

Figure 2

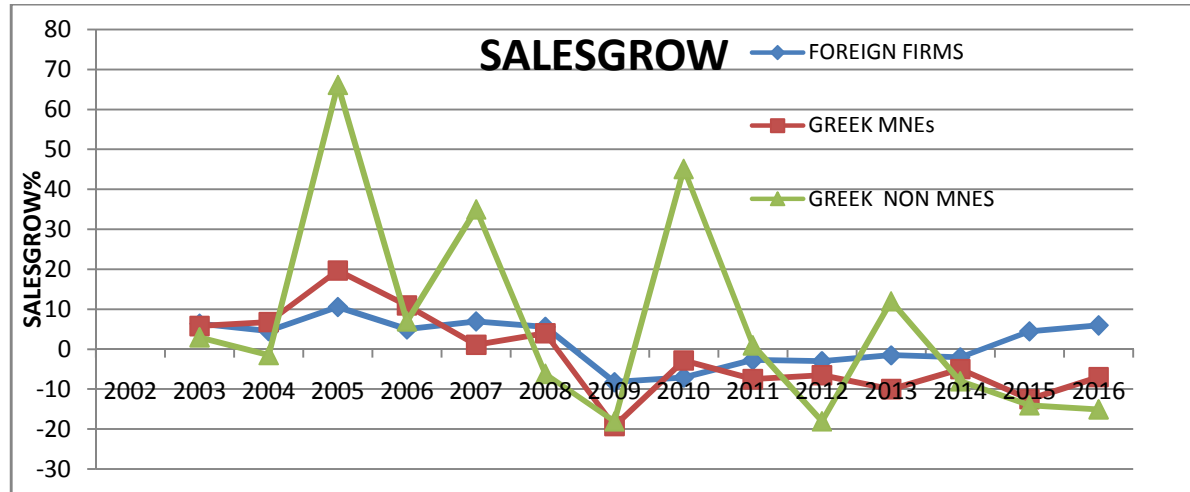
Return on Assets (ROA)



Foreign firms are subsidiaries of foreign MNEs located in Greece

2016: preliminary data

Figure 3
Turnover change (SALESGROW)



Foreign firms are subsidiaries of foreign MNEs located in Greece

2016: preliminary data

Table 1: Industry sector of the sample firms

Industry NACE-4 Digit Level	Foreign-firms ¹	Greek MNEs	Greek non-MNEs	All firms
Foods	6	6	6	18
Beverages	3	3	3	9
Tobacco products	1	1	1	3
Textiles	9	9	9	27
Clothing/ Leather	4	4	4	12
Printing/publishing	2	2	2	6
Paper	3	3	3	9
Petroleum products	2	2	2	6
Chemical products	17	17	17	51
Rubber products & plastics	4	4	4	12
Nonmetallic minerals	4	4	4	12
Primary metals /metal products	7	7	7	21
Machinery/ electrical appliances	15	15	15	45
Transportation/ shipping	1	1	1	3
Other industries	2	2	2	6
Total	80	80	80	240

1. Foreign firms are subsidiaries of foreign MNEs located in Greece

Table 2**Descriptive statistics and Pearson correlations of the independent variables**

Variables	GDPC	EXPO	AGE	LABOR	SIZE	OPEN
Mean	25285	28	38	54566	197	78
Median	25081	17	37	205073	125	76
SD	3459	28	20	1715665	251	35
Max	30821	100	51	1125212	2085	190
Min	20656	0	11	744	31	21
GDPC	1.00					
EXPO	-0.01	1.00				
AGE	-0.00	-0.06	1.00			
LABOR	0.04	-0.05	0.06	1.00		
SIZE	-0.01	-0.02	0.18	0.01	1.00	
OPEN	0.05	0.14	-0.17	-0.01	-0.23	1.00

Note: The dummies are excluded

Table 3**Paired samples t-test (two-tailed)**

Variables	Foreign firms¹ vs. Greek MNEs [1]	Foreign firms¹ vs. Greek non MNEs [2]	Greek MNEs vs. Greek non MNEs [3]
ROE			
Mean difference	25.44	24.10	-1.34
P-value	0.000	0.000	0.648
ROA			
Mean difference	19.13	14.83	-4.30
P-value	0.000	0.000	0.019
SALESGROW			
Mean difference	-1.35	-4.36	-2.99
P-value	0.452	0.074	0.263
GDPC			
Mean difference	0	0	0
P-value	*	*	*
AGE			
Mean difference	6.90	13.20	6.46
P-value	0.000	0.000	0.000
SIZE			
Mean difference	3.8	205.0	201.2
P-value	0.817	0.000	0.000
EXPO			
Mean difference	1.41	-3.87	-5.28
P-value	0.383	0.029	0.001
LABOR			
Mean difference	-311142	97813	408955
P-value	0.003	0.165	0.000
OPEN			
Mean difference	-9.61	-13.39	-3.78
P-value	0.000	0.000	0.082

* all values are identical

A positive sign of mean difference shows that in each pair of firms the first group outperformsthe second group, and vice versa

1. Foreign firms are subsidiaries of foreign MNEs located in Greece

Table 4

Regression results – The determinants of firm performance, 2002-2016

Variables	ROE			ROA			SALES-GROW		
	Model-1	Model-2	Model-3	Model-1	Model-2	Model 3	Model-1	Model-2	Model 3
OWNER	25.8333 (0.0001)		21.7688 (0.0000)	17.1840 (0.0000)		17.8888 (0.0000)	1.2823 (0.0415)		2.1234 (0.0322)
MULTI		-3.1861 (0.4565)	-4.5609 (0.3354)		-6.5545 (0.1853)	-4.5567 (0.1755)		-0.6764 (0.8434)	-1.4544 (0.7765)
CRISIS	-12.4423 (0.0000)	-13.5260 (0.0001)	-11.2322 (0.0003)	-8.6663 (0.0000)	-10.2442 (0.0000)	-9.3344 (0.0003)	-15.0881 (0.0000)	-13.3449 (0.0000)	-12.8887 (0.0002)
GDPC	0.0706 (0.0009)	0.0666 (0.0007)	0.10002 (0.0000)	0.0556 (0.0001)	0.0333 (0.0001)	0.0987 (0.0000)	0.0567 (0.0099)	0.0562 (0.0001)	0.0987 (0.0004)
EXPO	-0.1119 (0.1451)	-0.0817 (0.3784)	-0.0111 (0.2342)	-0.1195 (0.0733)	-0.0851 (0.1630)	-0.0765 (0.1435)	-0.0418 (0.1972)	-0.0537 (0.1460)	-0.0787 (0.2342)
AGE	-0.0090 (0.9621)	-0.0122 (0.7876)	-0.0768 (0.8873)	-0.0420 (0.5490)	-0.0337 (0.6446)	-0.0999 (0.7689)	0.2624 (0.0011)	0.1582 (0.0017)	0.1666 (0.0045)
LABOR	8.12×10^{-7} (0.3532)	7.92×10^{-7} (0.3657)	5.11×10^{-7} (0.2453)	5.18×10^{-7} (0.3441)	5.36×10^{-7} (0.3791)	4.15×10^{-6} (0.1988)	4.19×10^{-6} (0.0000)	4.15×10^{-6} (0.0000)	4.10×10^{-6} (0.0003)
SIZE	-0.0028 (0.7002)	-0.0067 (0.5524)	-0.0230 (0.6056)	-0.0035 (0.8436)	-0.0066 (0.5678)	-0.0345 (0.4444)	0.0193 (0.0253)	0.0099 (0.0208)	0.1100 (0.0355)
OPEN	-0.0019 (0.2554)	-0.0801 (0.2445)	-0.1023 (0.2111)	-0.0015 (0.4554)	-0.0441 (0.3993)	-0.0023 (0.1778)	0.0003 (0.5369)	0.0222 (0.4580)	0.01120 (0.3342)
OWNER x CRISIS	1.8842 (0.0777)		1.6654 (0.0455)	1.8776 (0.0663)		2.0003 (0.0645)	12.2316 (0.0006)		11.2231 (0.0005)
MULTI x CRISIS		-6.3897 (0.0006)	-5.4444 (0.0004)		-3.5537 (0.0002)	-3.2433 (0.0000)		-9.4151 (0.0009)	-5.6766 (0.0006)
Constant	20.7044 (0.9212)	-7.3008 (0.9744)	12.7144 (0.9002)	80.1691 (0.6551)	84.3400 (0.5555)	67.5555 (0.4356)	76.2406 (0.0318)	-301.2557 (0.0225)	-67.3433 (0.1233)
N	3600	3600	3600	3600	3600	3600	3595	3595	3595
Adjusted R²	0.2289	0.2889	0.2789	0.3598	0.3615	0.3865	0.6503	0.7083	0.6966

Note: The p-values are in parentheses.

Table 5

Regression results – The determinants of firm performance in the expansion and the recession periods (total investigation period 2002-2016)

Variables	Expansion period (2002-2007)			Recession period (2008-2016)		
	ROE	ROA	SALES-GROW	ROE	ROA	SALESGROW
OWNER	24.3557 (0.0000)	18.7322 (0.0000)	7.6009 (0.0445)	26.2243 (0.0004)	18.5558 (0.0001)	4.1160 (0.0009)
MULTI	-3.4682 (0.5163)	-5.4890 (0.1662)	1.6539 (0.5564)	1.2008 (0.7733)	-2.1367 (0.6908)	-6.9943 (0.0233)
GDPC	0.4834 (0.3220)	0.3061 (0.3311)	1.8383 (0.0004)	2.1147 (0.0011)	1.5604 (0.0001)	0.1451 (0.0000)
EXPO	-0.1333 (0.2664)	-0.0776 (0.2214)	-0.0779 (0.2056)	-0.0516 (0.6606)	-0.0583 (0.4521)	-0.0210 (0.6588)
AGE	-0.0174 (0.8041)	-0.0098 (0.8756)	-0.2083 (0.0059)	0.0128 (0.9859)	0.0844 (0.4631)	-0.1033 (0.0433)
LABOR	3.64×10^{-7} (0.7074)	0.0198 (0.9256)	6.16×10^{-6} (0.0000)	1.32×10^{-6} (0.4444)	7.97×10^{-7} (0.4062)	1.55×10^{-6} (0.0533)
SIZE	0.0016 (0.9165)	-0.0016 (0.8825)	0.0097 (0.2331)	-0.0155 (0.2630)	-0.0089 (0.3429)	0.0139 (0.0312)
OPEN	-0.0476 (0.5497)	-0.0476 (0.4456)	0.0455 (0.3973)	-0.1289 (0.2151)	-0.0582 (0.5447)	-0.0245 (0.7746)
OWNER x GDPC	0.0321 (0.0421)	0.0018 (0.0503)	0.0011 (0.0885)	-0.0009 (0.0895)	-9.3705 (0.0730)	-0.0012 (0.0012)
MULTI x GDPC	0.0009 (0.5555)	0.3415 (0.9662)	0.0015 (0.1923)	0.0008 (0.0009)	0.0004 (0.0005)	0.0006 (0.0002)
Constant	-6.1279 (0.9812)	-7.5774 (0.9273)	-65.7429 (0.0419)	-13.6839 (0.9234)	36.7869 (0.5082)	-94.1961 (0.1555)
N	3600	3600	3595	3600	3600	3600
R² adjusted	0.3215	0.3567	0.6988	0.3756	0.4882	0.3644

Note: The p-values are in parentheses.

Table 6

Regression results – The determinants of firm performance, 2002-2016, extended sample

Variables	ROE			ROA			SALES-GROW		
	Model-1	Model-2	Model 3	Model-1	Model-2	Model 3	Model-1	Model-2	Model-3
OWNER	23.8224 (0.0001)		16.8894 (0.0001)	19.1991 (0.0000)		23.0094 (0.0001)	1.1229 (0.0644)		2.2229 (0.0554)
MULTI		-3.1478 (0.8740)	-3.1338 (0.5640)		-6.0717 (0.2247)	-7.3338 (0.2640)		-0.9994 (0.0646)	-0.4794 (0.0846)
CRISIS	-11.4444 (0.0000)	-14.5265 (0.0001)	-16.5262 (0.0000)	-8.9012 (0.0000)	-10.7684 (0.0000)	-11.5266 (0.0000)	-16.9084 (0.0007)	-18.6677 (0.0002)	-23.1237 (0.0007)
GDPC	0.0235 (0.0001)	0.0999 (0.0003)	0.0345 (0.0000)	0.0634 (0.0003)	0.0932 (0.0000)	0.0245 (0.0003)	0.1056 (0.0000)	0.1250 (0.0003)	0.0050 (0.0003)
EXPO	-0.1220 (0.1661)	-0.1011 (0.2476)	-0.1365 (0.2231)	-0.1095 (0.0634)	-0.1016 (0.0873)	-0.1365 (0.17771)	-0.1498 (0.2278)	-0.0551 (0.2546)	-0.0351 (0.1222)
AGE	0.0070 (0.9126)	0.0447 (0.5507)	0.0879 (0.1989)	0.0420 (0.6456)	0.0337 (0.7146)	0.0872 (0.2289)	-0.2624 (0.2842)	-0.1576 (0.0818)	-0.2236 (0.1433)
LABOR	7.10x10 ⁻⁷ (0.3221)	8.43x10 ⁻⁷ (0.4302)	7.47x10 ⁻⁷ (0.3030)	5.83x10 ⁻⁷ (0.3551)	5.76 x10 ⁻⁷ (0.3160)	7.44x10 ⁻⁷ (0.2330)	4.10x10 ⁻⁶ (0.0004)	4.01 x10 ⁻⁶ (0.0005)	4.33 x10 ⁻⁶ (0.0011)
SIZE	-0.0111 (0.6644)	-0.0167 (0.4307)	-0.1122 (0.3212)	-0.0029 (0.7036)	-0.040 (0.5878)	-0.0122 (0.2222)	0.0373 (0.0477)	0.0118 (0.0333)	0.0818 (0.0465)
OPEN	0.0455 (0.2248)	-0.0569 (0.2279)	-0.02234 (0.1676)	-0.0672 (0.3289)	-0.0401 (0.4479)	-0.09734 (0.2666)	-0.1097 (0.5594)	0.1285 (0.4422)	0.2177 (0.1822)
OWNER x CRISIS	2.8834 (0.0830)		3.4444 (0.0466)	1.0776 (0.0837)		4.4444 (0.0556)	16.3104 (0.0002)		24.3333 (0.0010)
MULTI x CRISIS		-4.4477 (0.0002)	-5.6722 (0.0001)		-3.5603 (0.0001)	-7.6422 (0.0004)		-10.4557 (0.0011)	-20.4533 (0.0009)
Constant	20.1041 (0.8784)	-6.3888 (0.7678)	34.5564 (0.3456)	56.1691 (0.5751)	15.9417 (0.3555)	44.0564 (0.3356)	20.4446 (0.4910)	25.2555 (0.1288)	32.2322 (0.3244)
N	5760	5760	5760	5760	5760	5760	5756	5756	5756
Adjusted R²	0.2642	0.2989	0.3001	0.3298	0.3415	0.3412	0.6993	0.7456	0.7784

Note: The p-values are in parentheses.

Table 7

Regression results – The determinants of firm performance in the expansion and the recession period (total investigation period 2002-2016)- extended sample

Variables	<i>Expansion Period (2002-2007)</i>			<i>Recession period (2008-2016)</i>		
	ROE	ROA	SALESGROW	ROE	ROA	SALESGROW
OWNER	22.6557 (0.0000)	19.3322 (0.0000)	6.6709 (0.0000)	21.0443 (0.0000)	15.5555 (0.0001)	6.3360 (0.0000)
MULTI	-5.4644 (0.5333)	-6.4897 (0.1672)	1.4539 (0.5064)	1.2099 (0.7755)	-2.2267 (0.5908)	-5.9942 (0.0222)
GDPC	0.4888 (0.4420)	0.3661 (0.3348)	2.8385 (0.0001)	2.0047 (0.0001)	1.8804 (0.0003)	0.1331 (0.0000)
EXPO	-0.1322 (0.4404)	-0.0776 (0.4414)	-0.0879 (0.2856)	-0.1516 (0.7506)	-0.0983 (0.5521)	-0.1010 (0.8588)
AGE	-0.0274 (0.8241)	-0.0398 (0.8556)	-0.2033 (0.0069)	0.0128 (0.9850)	0.0844 (0.4644)	-0.1075 (0.1100)
LABOR	3.645×10^{-7} (0.7075)	0.0199 (0.9000)	4.16×10^{-6} (0.0001)	1.37×10^{-6} (0.4456)	7.90×10^{-7} (0.4962)	1.66×10^{-6} (0.0653)
SIZE	0.0116 (0.9965)	-0.0116 (0.9825)	0.0897 (0.2399)	-0.0155 (0.2688)	-0.0089 (0.3444)	0.0140 (0.0392)
OPEN	-0.0576 (0.5897)	-0.0476 (0.4599)	0.0455 (0.3443)	-0.1289 (0.2155)	-0.0588 (0.5446)	-0.0248 (0.7777)
OWNER x GDPC	0.1021 (0.0321)	0.0018 (0.0543)	0.0111 (0.0805)	-0.0009 (0.0505)	-4.3705 (0.0630)	-0.0012 (0.0045)
MULTI x GDPC	0.0019 (0.5555)	0.3415 (0.7562)	0.0015 (0.1623)	0.0018 (0.0003)	0.0024 (0.0008)	0.0076 (0.0002)
Constant	-6.5279 (0.9992)	-7.8774 (0.9773)	-65.7429 (0.0424)	-13.6866 (0.5234)	36.7833 (0.5282)	-94.1961 (0.2455)
N	5760	5760	5756	5760	5760	5756
R² adjusted	0.3415	0.3777	0.7058	0.3996	0.5082	0.4608

Note: The p-values are in parentheses.