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INTERNATIONALISATION, CULTURAL DISTANCE AND COUNTRY CHARACTERISTICS: A BAYESIAN ANALYSIS OF SMES FINANCIAL PERFORMANCE

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Abstract. Relying on the accounting data of a panel of 403 Italian manufacturing SMEs collected over a period of 5 years, we find results suggesting that multinationality per se does not impact on the economic performance of international small and medium sized firms. It is the characteristics of the country selected, i.e. the political hazard, the financial stability and the economic performance, that significantly influence SMEs financial performance. The management implication for small and medium sized firms selecting and entering new geographic markets is significant, since our results show that for SMEs it is the market selection process that really matters and not the degree of multinationality.

Keywords: SMEs, financial performance, host country characteristics, Bayesian statistics, internationalisation, panel data model.

JEL Classification: M10, M16, F10, F14, C11, C33.

Introduction

Recent literature (Yang, Driffield 2012) has pointed out there has been little research into the relationship between multinationality and the performance of small and medium-sized enterprises generating a sampling bias in terms of firm size. Few studies (Beamish, Lu 2001; Qian 2002; Lu, Beamish 2006), acknowledging this research gap, have empirically tested the effects of internationalisation on SME performance broadening the concept of internationalisation and also including international investments. On the contrary, the number of studies devoted to larger firms is far greater (Glaum, Oesterle 2007). With regards to these firms the relationship between multinationality and performance has been thoroughly tested. However, most of the studies on the relationship between multinationality and performance have dealt with internationalisation without

explicitly considering the destination of the investments involved. Internationalisation is a complex multi-faced concept (Sullivan 1994) and firms can undertake international expansion not only through very different means but also in vastly different environments, ranging from similar regions, close to home to geographically and culturally distant countries. Taking in account this problem, in recent time increasing efforts have been made to research the determinants of international firms profitability from new angles. Different authors (Delios, Beamish 1999; Hitt *et al.* 2006) have tested, not only the effects of internationalisation *per se*, but also the effect that different location and country characteristics have on the overall performance of a firm (Chen, Tan 2012). In the present paper we adopted this view assuming that the economic performance of international firms is the result, among other things, of the level of internationalisation but also of the characteristics of the countries chosen by firms in their international expansion. Our study explores the performance benefits associated with different subsidiary locations and levels of internationalisation, and explicitly checks the influence of other different firm-specific factors such as size, intangible intensity and the industry sector. The idea that geographical markets differ and therefore have different impacts on firms' performance is surprisingly unexplored in studies of management and entrepreneurship (Chen, Tan 2012). This research gap leads Makino *et al.* (2004: 1030) to observe that "*most .. ...of the studies... ...implicitly assume that the variation in business unit performance within and between industries is constant across countries*". The present analysis has been devoted to bridging this research gap. Using the Bayesian regression panel data technique our findings confirm that for SMEs the evolution of country characteristics affects internationalisation.

The paper is organised in the following way. In the next section we develop the conceptual framework behind our analysis reviewing the literature and developing the empirical hypotheses; then we describe our data and the methodology we used. Finally, we present the results and discuss our main findings.

1. Theory and hypotheses

The relationship between internationalisation and economic performance has been intensively explored in management literature (for a review see Contractor *et al.* 2003). With regards to SMEs the concept has been much less researched (Qian 2002). Some authors (Beamish, Lu 2001) point out that for minor firms the process of market discovery at the international level is long and costly. Therefore, according to their view, in the early stages of internationalisation learning costs are high because of the need to explore foreign markets, cultures and habits. However, most of the studies on SMEs show that small firms develop very different means of acquiring foreign market knowledge (Bonaccorsi 1992). Many small firms rely on methods such as networks or alliances in order to gain vital knowledge about foreign markets. Majocchi and Zucchella (2003), for example, show that export activities are often used by SMEs to gain market knowledge that is then used to enter foreign markets with direct investments. Along similar lines, Gomes-Casseres (1997) shows that alliances with local partners are often used by SMEs

to increase market knowledge and improve the performance of the firm through the internationalisation process. Kohn (1997) in his research into US international SMEs finds that manufacturing firms tend to focus on very narrow market segments in which they are market and technological leaders. Focusing on very small niche markets, mainly in the industrial sector, SMEs tend to have a profound knowledge of the market and in this way overcome the knowledge and managerial barriers that often stand in the way of small firm international expansion. All these findings support the idea that SMEs have different means of offsetting the initial negative effects of the internationalisation process. Since costs tend to decline, as internationalisation proceeds, while the benefits brought about by the economies of scale generally increase the relationship tends to be nonlinear. The overall effect for SMEs on profitability tends to be positive with the slope of the relationship increasing for higher levels of internationalisation. This logic suggests the following hypotheses:

H1: The relationship between international geographical dispersion and overall SME performance is positive and nonlinear with the slope being flat for low level internationalisation and steep for high levels of internationalisation.

With regard to SMEs the hypothesis that the positive effects of internationalisation increase as the international presence of the firm reaches a certain stage is rooted in the idea that firms progressively learn form their international experience (Johanson, Vahlne 1990; Zhara *et al.* 2000). However, the results of the process depend both on the learning effort (Sapienza *et al*. 2005) and on the psychic distance between the local market and the foreign market. The larger the psychic distance the more difficult it is for SMEs to gain effective market knowledge on their target countries. The concept of psychic distance, as defined by Johanson and Wiedersheim-Paul (1975), is made up of different aspects such as cultural and language differences between countries but also legal and administrative system differences. So when SMEs develop new ventures in foreign countries they have to adapt their domestic culture to the new environment. A review of studies on internationalisation suggests a considerable amount of empirical support for the idea that cultural distance affects internationalisation. According to this view, the larger the cultural distance between the countries where the firm's subsidiaries have been placed and the home country, the more difficult and time-consuming it will be for firms to get the necessary knowledge. For example, Vermeulen and Barkema (2001) found that when an international company has invested in very dissimilar countries, it faces increasing problems in the management of different sources of information consequently leading to higher costs. These problems are even greater for small and medium sized firms which are typically short of critical resources such as an internationally trained staff or financial resources to obtain consultancy services and consequently enter in new markets with a lower level of knowledge about the new business conditions. However, these liabilities are not independent from the target countries chosen by the firms that are internationalising. Firms growing in distant markets from a psychological, cultural and legal point of view face higher costs due to longer time and efforts to get the necessary knowledge and to the rise in the costs of coordination and control. The

closer the cultural and business habits between the home and the target countries the easier will be for the SMEs to gain the necessary knowledge about the new markets. In this sense cultural distance will have a mitigating effect on the firm's overall performance. We therefore propose the following hypothesis:

H2: The larger the average cultural distance amongst the overall international network of subsidiaries the lower the overall SME performance.

Cultural distance is only one of the possible features of the much wider phenomenon relating to the degree of diversity among the country environments. There is an emerging body of theoretical literature and empirical evidence that highlights the role played by institutional factors in shaping international firm strategies (Peng 2002; Meyer, Nguyen 2005). These studies show that the political and institutional characteristics of the host countries effect firm behaviour. Political and economic diversity should be considered too as firms also have to accommodate their strategies to political and economic factors, that differ from country to country. Part of the total firm risk consists of political risk arising from operations in foreign countries. Kobrin (1979) defines political risk as the chance of negative consequences arising from political events. More generally, political risk can be defined as any unexpected change in the host government's policy that effects the business environment where the firms operate (Butler, Domingo Castelo 1998). This risk is a very difficult concept to measure but recently Henisz (2000) computed an index – the Political Constraint Index – that gauges this kind of risk and that has already been effectively used in many empirical works (Goerzen, Beamish 2003). The index aims at measuring the role of checks and balances on policy-makers' discretion in the political system. Where the policy makers' discretion is high the political risk of the investment is higher.

Most of the studies so far have considered the effect of political instability on the level of investment in country finding a negative relationship (Guisinger 2003). This negative relationship is justified by the fact that when political risk is high the probability of negative consequences arising from political events is higher. This relationship surely holds for large firms. Big firms have different means for influencing and negotiating with the political authorities over their investments in new countries and therefore can manage this specific risk. On the contrary SMEs have less bargaining power when investing in a foreign country given the limited amount of resources transferred. Moreover, the potential impact of an adverse decision by the political authorities is relatively higher for SMEs whose existence could even be jeopardized by adverse political events. This means that for small firms investments in political high-risk countries can be meaningful only if the investment pay-off is worth the additional risk. Zahra and Garvis (2000), using a subjective measurement of the perceived environmental risk, found that firms looking for international expansion have higher profit. Consequently, the higher the political risk that SMEs have to face the higher the economic results. Therefore, we put forward the following hypothesis:

H3: The larger the average political hazard the higher the overall firm performance.

Finally, we consider the impact on firm profitability of the overall economic performance and of the level of economic risk in the countries where the subsidiaries are

located. Click (2005) finds that business cycle and country rating have positive effects on FDI profitability in his study on the country-specific components of the returns on American FDI. Therefore, we also include these variables in our analysis. This effect should be even stronger for small and medium sized firms since in this context the decision to create a subsidiary in a foreign country typically involves a large share of its resources and is generally devoted only to major markets. Consequently, if the market is performing well and the economic condition measured by the country's rating is positive it is likely that this positive effect will be transferred to the economic performance of firms. Therefore we posit the two following hypotheses:

H4: Firms characterized by subsidiaries located in countries with a more stable economic condition i.e. with higher financial rating, will show higher overall firm performance.

H5: Firms characterized by subsidiaries located in countries with higher economic growth will show higher overall firm performance.

2. Methodology

2.1. Data and sample

The data we used in the analysis were collected from different sources. The primary source is the database AIDA (Bureau Van Dijk), which contains the financial and commercial data for enterprises characterized by a turnover of at least one million euros, operating in Italy. This database is the Italian section of the European database Amadeus which has been widely used in previous research (Brouthers 2002). We also collected data from other databases to estimate the diversity in the country environment of subsidiaries. Following Goerzen and Beamish (2003), we associated a series of variables to each firm defining the country characteristics of the area where the firm located its foreign affiliates. The country features include the measure of the political hazard of the FDI destination countries, by means of the Political Constrained Index suggested by Heinsz, and the cultural distance between Italy and the subsidiary countries, computed by the Cultural Diversity Index (Hofstede 1980; Kogut, Singh 1988). Afterwards, we added the sovereign credit ratings, in order to evaluate the overall economic stability of the different locations of firm affiliates, computed by the rating agency Standard and Poor's. Finally, thanks to the data in the World Development Report from the World Bank, we included information about the GDP growth rate referring to the year in question. As control variables at the country level in the model we also added the inflation index the unemployment index and the cost of business start-up as a measurement of the business climate in the country. Thus, from the different sources listed above we created a unique database of SMEs with FDI.

From the AIDA database we extracted information about Italian firms with less than 500 employees, operating in the manufacturing sector and with subsidiaries in at least one foreign country. In the European context the EU Commission's definition refers to 250 employees as one of the criteria to discriminate between SMEs and large firms. Consequently, most of the studies performed in European countries have used this reference

value. However, outside Europe the 500 employees' cut-off rate is the most commonly adopted criterion (see, for example, Lu, Beamish 2001). Recently other European scholars (De Clercq *et al.* 2005; Moen, Servais 2002) have used the 500 cut-off point for their studies. Following them, we decided to adopt the latter more generous criterion in order to facilitate comparison of our results with similar studies performed in other parts the world.

We considered the selected enterprises for a period of five years, from 2000 to 2004, with the aim of observing their evolution over that particular time span. The original dataset of firms with a full list of foreign subsidiaries had 753 observations, but after removing observations with accounting data missing for any of the 5 years considered we obtained the final sample with 403 cross-sections (firms) and a 5 year time-series that makes up a panel data consisting of a total of 2015 observations.

2.2. Description of variables

In this paper we try to measure the impact of internationalisation on SME economic performance using, as a proxy of performance, an accounting measure i.e. the return on assets (ROA). Since the model is aimed at identifying the role of internationalisation variables on economic performance we classify the covariates into two main categories (Figure 1): Internationalisation Variables and Control Variables. The latter group contains firm specific features such as "firm age" and "number of employees", balance sheet variables like "debt-to-equity ratio" and "intangible intensity" and industry sector variables. The former group is made up of variables indicating the geographical dispersion ("number of foreign subsidiaries"), country environment diversity (Politi-

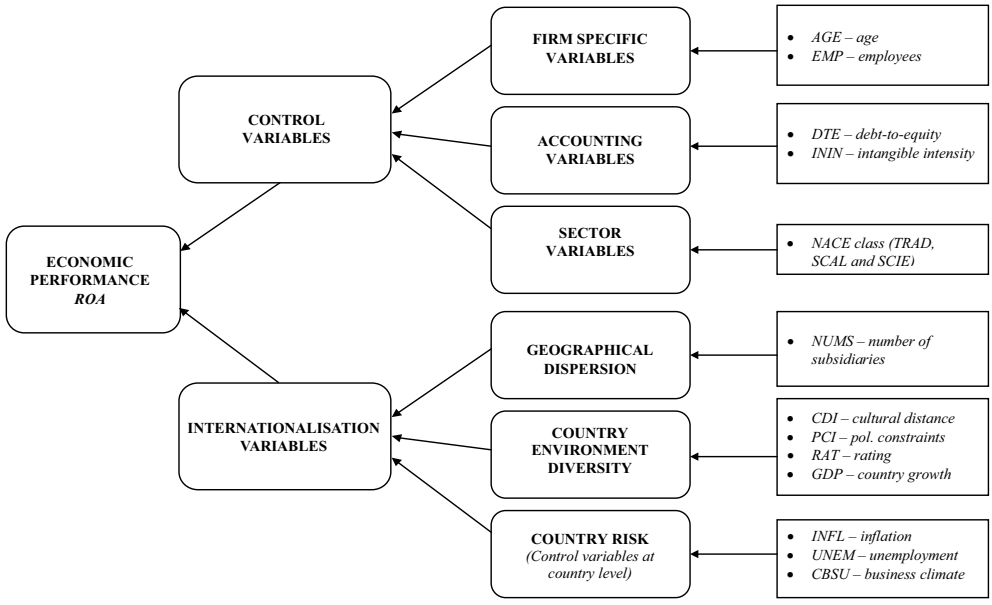

Fig. 1. The model

cal Constraint Index "PCI", Cultural Diversity Index "CDI", Cost of business start up and GDP growth) (Goerzen, Beamish 2003) and the country risk (rating, inflation and unemployment).

Given the data at hand we measure internationalisation with the number of foreign subsidiaries (*NUMS*); then we enrich our analysis with an in-depth description of the country characteristics of the regions where the subsidiaries have been located. We use an index called Cultural Diversity Index (*CDI*) that highlights the cultural differences between countries using the Kogut and Singh (1988) transformation of the Hofstede measurements (Hofstede 1980). The index measuring cultural diversity takes into account the socio-cultural distance between Italy and the country where FDI is located using four indicators suggested by Hofstede. For every firm we compute a Cultural Diversity Index referring to all the countries where the SME has subsidiaries. The larger the index the larger the distance between the home country of the SMEs and the countries where the subsidiaries have been located. Therefore, according to our hypothesis the relationship of the cultural distance index with profitability should be negative.

The Political Constraint Index (*PCI*), measures the differences between the policy systems of different countries. This indicator estimates the feasibility of policy change and in particular the extent to which a change in the preferences of any institutional actor may lead to a change in government policy (Heinsz 2000). Possible scores for the final measures of political constraint range from zero for the most hazardous countries to one for the most constrained. Since the measure of political risk we have used assigns a lower value to the most risky countries we predict a negative relationship between the political risk variable and the total return of the firms. Indexes measuring PCI are calculated, for each observation, as the mean of index values corresponding to the countries where the firm has a subsidiary. The country rating (*RAT*) was taken from the Standard & Poor's database for all the countries and the years involved in the analysis. In order to transform the different rating classes (AAA, AA, A, …) into a linear scale we assigned the value 1 to the worst performers with a country rating of D and we increased the value for every upgrade in a linear way up to the value of 15 for the best performers. Finally, we took the GDP growth rate (*GDP*) for every country in order to have an objective measure of the country's economic condition.

As control variables at a country level we also included other variables such as the inflation (*INFL*) and the unemployment (*UNEM*) indexes, extracting this information from the World Development Report. Using the World Bank data from the database "Doing Business with" we also considered the average cost of starting a business (*CBSU*) a proxy of the general business climate in each country. This measure identifies the bureaucratic and legal hurdles an entrepreneur must overcome to incorporate and register a new firm. With regard to control variables at a firm specific level we calculated the natural logarithm of the variables that measure the firm experience (*AGE*) and firm size (*EMP*), as we are more interested in their relative changes than in absolute changes. We also inserted a variable (*DTE*) defining the debt to equity ratio, a variable measuring intangible intensity (*ININ*) computed as the ratio of expenditures in R&D on total sales and a set of dummy variables for industry sectors.

Table 1. Predicted sign of variables, measurements and sources

Variables	Construct	Expected sign	Sources	Measurement
Geographical dispersion				
NUMS	Internationalisation	+	AIDA	n. of subsidiaries
$NUMS^2$	Internationalisation	+	AIDA	(n. of subsidiaries)-squared
Country envir. diversity				
CDI	Cultural distance	–	www.geert.hofstede.com	Measured through the Kogut & Singh index: range 0 to 4.15
PCI	Political hazard	–	www-management.wharton.upenn.edu/henisz	From 0 (full freedom) to 1 (full constriction)
RAT	Country financial stability and risk	+	www.standardandpoors.com	From 1 to 25
GDP	Market growth	+	www.worldbank.org	% growth on previous year
Control variables at country level (Country risk)				
INFL	Inflation rate	= =	www.worldbank.org	in %
UNEM	Unemployment rate	= =	www.worldbank.org	in %
CBSU	Business climate	= =	www.worldbank.org	Index from 0 to 10,75.2
Control variables at firm level		= =		
AGE	Firm age	= =	Aida Database	Log of years from year of foundation
EMP	Firm size	= =	Aida Database	Number of employees: from 1 to 499
DTE	Financial leverage	= =	Aida Database	Ratio of debt on equity
ININ	Intangible intensity	= =	Aida Database	R&D costs/total assets
TRAD	Traditional sector	= =	Aida Database	Nace Code- Dummy variable
SCAL	Scale intensive sector	= =	Aida Database	Nace Code- Dummy variable
SCIE	Science-based sector	= =	Aida Database	Nace Code- Dummy variable

Table 2. Descriptive statistics

Variable		Mean	Std. dev	Min	Max
ROA	*overall*	0.06	0.07	–0.84	0.46
AGE	*overall*	20	1.9	1	98
log(AGE)	*overall*	3.012	0.64	0	4.59
EMP	*overall*	85	3.01	1	488
log(EMP)	*overall*	4.44	1.101	0	6.19
DTE	*overall*	5.35	10.86	–102.78	233.5
ININ	*overall*	0.01	0.04	0	0.45
NUMS	*overall*	1.47	0.97	1	9
CDI	*overall*	0.96	0.68	0.21	3.12
PCI	*overall*	0.45	0.07	0.12	0.70
RAT	*overall*	22.34	3.33	9	24
GDP	*overall*	2.59	1.68	–7.49	9.91
INFL	*overall*	4.81	8.37	–0.67	54.81
UNEM	*overall*	8.07	2.74	2.25	19.9
CBSU	*overall*	7.13	10.59	0.5	136.6

[1] Number of observations N = 2015 (dimension of the whole dataset); n = 403 (dimension of the cross-section); T = 5 (dimension of the time-series)

Table 1 shows the sources, the measurement and the predicted sign of our variables, Table 2 contains some descriptive statistics of the sample.

2.3. The Bayesian panel data model

The data consists of repeated observations on the same cross section of 403 firms over five years. Due to the temporal correlation of the companies over the time horizon, the best statistical method to be applied appears to be the Panel Data Model (Wooldridge 2010). The selected model is undoubtedly appropriate, but the choice between fixed and random effects might not always be straightforward. We extracted a sample of firms from a larger population of Italian manufacturing SMEs and this approach might suggest the use of random effects, since the cross-sectional units in the sample are regarded as random drawings. To confirm our conclusion, we performed the Chow test for unobserved heterogeneity (Chow 1960) and the Hausman test in order to verify the suitability of the random effects model (Hausman 1978). Results prove that the random effects model is appropriate for the data and we chose to estimate it through a Bayesian hierarchical approach. The Bayesian approach is particularly suitable for estimating random effects as it is possible to produce posterior distributions for a large number of unit-level parameters. Moreover, it avoids the drawbacks caused by the sparseness of individual-level data, like, for example, the lack of identification at the unit level or the uncertainty with which estimates are often measured using standard asymptotic methods (Chib *et al.* 2008; Rossi *et al.* 2006).

In this context, Bayesian models are the most appropriate choice, since they allow us to obtain estimates such as the point estimates of unit-level parameters, also giving information about their uncertainty (Chib *et al.* 2008). We therefore run a Hierarchical Bayesian Panel Data Model, as applied in the literature by Hansen *et al*. (2004). In this study, the performance parameter is expressed as a function of the firm, the industry

in which the firm operates and the set of administrative decisions (actions) made by the firm. A *prior* distribution has been specified for the entire set of parameters and the joint *posterior* distribution is then estimated through Markov Chain Monte Carlo (MCMC) (see, for example, Tang, Liou 2010). In order to reduce the number of parameters to be estimated we consider a *mixed model* that combines some elements of the random coefficients model and some elements of the pooled model. In particular, we permit the intercept to vary across individuals but restrict the other regression coefficients to be constant across individuals (Geweke *et al.* 2011). The resulting model equation is the following:

$$ROA_{it} = \alpha_0 + \alpha X_i + \beta Z_{it} + b_i + \varepsilon_{it}.$$

The dependent variable ROA_{it} shows the repeated measurements of the performance of firm i ($i = 1, ..., N$) at time t ($t = 1, ..., T$), for each of the $N = 403$ Italian firms under study at $T = 5$ time points. The intercept α_0 denotes the mean value of all the cross sectional intercepts, b_i corresponds to the firm specific error component, representing the random deviation of the individual intercept from α_0, and ε_{it} (supposed normally distributed with mean 0 and variance σ^2 for omoscedasticity), is the combined time series and cross section error component. The b_i are firm-specific random effects, initially given an exchangeable normal specification (with mean 0 and variance D), which allows for dependence among the longitudinal responses for firm i (Fong *et al.* 2010). The predictor variables can be clustered into two groups. The former includes 9 time-invariant variables, denoted by X_i, which do not vary for each firm from 2000 to 2004. The first 6 covariates are EMP_i (the number of employees of the i-th firm), $NUMS_i$ (the number of subsidiaries of the i-th firm), PCI_i (the political constraint index of the i-th firm's subsidiaries), CDI_i (the cultural diversity index of the i-th firm's subsidiaries), RAT_i (the rating of the i-th firm's subsidiaries), $CBSU_i$ (the cost of business start-up of the i-th firm's subsidiaries). Among the time-invariant variables there is also the number of employees that is typically a time-variant variable. However, due to data constraints we had to rely on the average number of employees over the period. The last 3 covariates are sectors dummies, derived by the NACE code, included in the model in order to consider the effects of industry specific factors. Using Pavitt (1984) taxonomy we grouped the industry sectors into four sets: the Traditional sectors (NACE classes: 15, 16, 17, 18, 19, 20, 28), the Scale-intensive sectors (NACE classes: 21, 22, 23, 24, 25, 26, 27, 31, 32, 34), the Specialized suppliers (NACE classes: 29, 36, 37) and the Science-based sectors (NACE classes: 30, 33, 35), using the Specialized suppliers group as the benchmark category. The resulting dummies included in the model are labelled as: $TRAD_i$ (traditional sectors), $SCAL_i$ (scale-intensive sectors), $SCIE_i$ (science-based sectors).

The second covariate group, denoted by Z_{it}, includes 6 variables which vary according to the firm and to the year. These variables are: DTE_{it} (the debt-to-equity ratio of firm i in year t), $ININ_{it}$ (the intangible intensity ratio of firm i in year t), AGE_{it} (the age of firm i in year t), GDP_{it} (the GDP growth associated with the i-th firm subsidiaries in year t), $INFL_{it}$ (the inflation associated with the i-th firm subsidiaries in year t), $UNEM_{it}$ (the unemployment associated with the i-th firm subsidiaries in year t). Note that all variables have been centered in order to speed the convergence of the Markov chains and for a

Table 3. Correlation matrix of variables

	1	2	3	4	5	6	7	8	9	10	11	12
AGE (1)	1											
EMP (2)	0.22**	1										
DTE (3)	–0.04	–0.08	1									
ININ (4)	–0.11**	0.03	0.01	1								
NUMS (5)	0.09	0.19**	–0.05	0.02	1							
CDI (6)	0.03	0.00	0.02	–0.06	0.04	1						
PCI (7)	0.03	–0.02	–0.03	0.02	0.00	–0.05	1					
RAT (8)	–0.02	0.09	–0.04	0.05	0.05	–0.13	–0.63**	1				
GDP (9)	0.01	–0.06*	0.02	–0.03	–0.00	–0.04	0.43**	–0.47**	1			
INFL (10)	0.02	–0.12*	0.04	–0.04	–0.08	0.11	0.68**	–0.76**	0.36**	1		
UNEM (11)	0.02	0.03	–0.03	–0.06	–0.02	0.21	–0.17**	–0.12	0.24**	0.03	1	
CBSU (12)	–0.06	0.08*	0.00	–0.01	–0.00	0.02	0.26**	–0.48**	0.23**	0.25**	–0.07*	1

Notes: Significance: ** 0.01 level (2-tailed); * 0.05 level.

clearer interpretation of the parameters, that here are denoted by the symbols α and β (respectively, the vectors of parameter estimates associated to the matrices X_i and Z_{it}).

Table 3 contains the correlations of the covariates included in the model. The values reported in the correlation matrix indicate that multicollinearity is not a problem in our database. However, we note that variables "inflation" and "rating" are negatively correlated, with a Pearson coefficient value of –0.7592. For this reason, we dropped the former variable in the restricted models.

3. Results and discussion

Based on the model expressed in equation (1), we designed one general model and two restricted models. The general results attained with the Bayesian approach are listed in Table 4.

Both the sample paths and the autocorrelation functions (that we do not show for lack of space) for the significant variables confirm the stability of the results across the different models (Brooks 1997). The posterior correlation matrix does not suggest any multicollinearity among covariates. As goodness of fit measures for the entire model, we employed the Mean Square Error (MSE) and the Root Mean Square Error (RMSE), computed as the expected value of the differences between the observed and the predicted ROA values (for more details see Efron, Tibshirani 1993) and the Deviance Information Criterion (DIC) suggested by Spiegelhalter *et al.* (2002). This last measure is calculated

Table 4. Bayesian Model's parameters estimates

	Bayesian model		
	General model	**Restricted model 1**	**Restricted model 2**
(intercept)	0.656	1.300**	1.293***
	(2.43)	(0.643)	(0.52)
NUMS	0.94		
	(1.83)		
$NUMS^2$	–0.11		
	(0.43)		
CDI	–0.19		
	(0.29)		
PCI	–0.02*	–0.020*	–0.016*
	(0.04)	(0.04)	(0.03)
RAT	0.03*	0.014*	0.014*
	(0.05)	(0.02)	(0.02)
GDP	0.05**	0.031**	0.030***
	(0.03)	(0.02)	(0.02)
log(AGE)	–0.33***	–0.364***	–0.332***
	(0.15)	(0.12)	(0.11)
log(EMP)	–0.02		
	(0.31)		
DTE	–0.30***	–0.289***	–0.275***
	(0.09)	(0.07)	(0.07)
ININ	–0.14*	–0.143**	–0.145**
	(0.09)	(0.08)	(0.08)
TRAD	0.14	0.253	
	(0.75)	(0.48)	
SCAL	0.40	–0.431	
	(0.76)	(0.96)	
SCIE	0.54	–0.018*	
	(2.03)	(0.036)	
INFL	0.02		
	(0.09)		
UNEM	–0.01		
	(0.06)		
CBSU	0.14		
	(0.22)		
Overall statistics			
MSE	1.107	1.050	1.039
RMSE	1.056	1.025	1.019
DIC	1440.05	1424.87	1418.78

Notes: The table displays posterior means. Standard deviations are in brackets.
Parameter's significance: *90% posterior credible interval; **95% posterior credible interval; ***97.5% posterior credible interval.

as the difference between the Deviance (the average of the log-likelihoods calculated at the end of an iteration of the Gibbs Sampler) and the log-likelihood calculated using the posterior means of the parameters. The less the goodness of fit measures the better the model. In our application, outcomes show a reduction in both error measurements going from the full model to the restricted models. These results confirm the reliability of the model and reinforce the findings of the analysis. However, it must be noted that not all our hypotheses are confirmed by the statistical analysis.

Among internationalisation variables, geographical dispersion (*NUMS*) has the expected sign while its square $(NUMS)^2$ has, contrary to our expectations, a negative sign. However, neither of the terms is significant and we decided to remove them in the restricted model. Therefore, hypothesis 1 is not confirmed. Our second hypothesis posits that the larger the average cultural distance amongst the overall international network of subsidiaries the lower the overall firm performance. Table 4 shows that even if the sign is as expected the coefficient is not significant. Therefore, our second hypothesis also remains unconfirmed.

Our strongest and most innovative results concern the effects of the Political constraint measure. The coefficient is negative and significant. This result confirms our third hypothesis stating that small firms venture into risky countries (with a low level of political constraint index) only if the higher risk involved is compensated by higher return. Political risk impacts on the overall economic performance of firms, and this is also true for SMEs. This finding is relevant since it not only confirms that the political characteristics of the host country have an impact on firm performance but also because this result seems particularly important for SMEs. Our results confirm Click (2005) findings but differ significantly from the findings of Buckely *et al*. (2007), who did not find evidence to support the hypothesis that FDI flows are negatively correlated to the levels of political risk. Even if the dependent variable in the Buckely *et al*. (2007) paper and in ours is different, as we consider economic performance and they consider the total flow of investments, this difference is striking. Their results seem to prove that firms do not consider political risk as a decisive variable when planning international investments. On the contrary our results show that the economic results of SMEs are affected by political instability and therefore if firms are rational (in their behaviour) they should consider political risk as an important variable in their strategies. A possible reconciliation of these seemingly contrasting results lies in the fact that our analysis is restricted to small and medium sized firms while when FDI flows are considered a large share of the total amount of investment is mainly from large firms. This means that SME economic performance is affected by different variables when compared to large firms. Big multinationals have different options to deal with political hazard since they have a high bargaining power that can be used in negotiations with local governments. Often, investments by large firms in risky countries are anticipated by negotiations with local political and administrative representatives, which aim to offer potential investors economic incentives and guarantees against adverse political decisions by local governments. Moreover this kind of firm frequently develops specific insurance policies designed to hedge their foreign investments against political risk. The same options are not

open to small and medium-sized enterprises, which consequently invest in highly risky countries only if there is a potential economic payoff. This conclusion has important theoretical implications because it means that when SMEs are considered the variables affecting their economic behaviour and performance differ from those that affect large firms. Any empirical analysis of international SMEs that does not consider the political characteristics of the subsidiary countries will be omitting an important variable, leading to a biased estimate of the economic performance of firms.

With regards to SMEs our findings also demonstrate that there are country specific effects in terms of country economic performance. Both the country rating and the country economic growth have the expected significant signs. The country economic performance and the relative rating, are particularly relevant covariates, characterized by a positive effect on economic performance, in the sense that firms with subsidiaries in the most reliable countries are associated with the highest levels of ROA. Therefore, hypotheses 4 and 5 are also confirmed. This proves that for SMEs the country selection process is a decisive strategic decision. Given their limited bargaining power and their limited resources small firms have to carefully select their playing field because this choice accounts for a significant share of their overall performance.

Considering control variables, the effect of firm age on economic performance is highly significant but negative, meaning that the older is a company the lower is its ROA. Intangible intensity and debt to equity variables are significant and they are characterized by a negative coefficient, so that the economic performance grows if intangible intensity and debt to equity diminish. The influence of industry sectors has a mixed effect on the dependent variable with firms in the science-based sector showing a lower profitability. This result is not surprising as entrepreneurial firms in science sectors often face decades of highly risky and highly uncertain research with high cash burn rates before they even hope to earn a profit (Pisano 2010).

Conclusions

The most innovative result of our analysis is twofold. Firstly, from a methodological point of view, we adopt a regressing methodology, only recently introduced in managerial studies but that, as we demonstrate in the paper, allows an improvement in reliability of the results. The potential of this methodology has recently been discussed in depth with regards to strategic management (Hansen *et al.* 2004; Hahn, Doh 2006) but has rarely been applied to the field of entrepreneurship analysis. We think that Bayesian methodology allows for a more detailed and fined-grained analysis shedding a new light both onto already well-explored research areas and new fields where the existence of rich but less well-behaved samples have hampered the research so far. Secondly, our results highlight some missing points in previous SME performance analysis. More specifically, our findings prove that, where SMEs are concerned, economic performance is affected by subsidiary location and that market features do matter. The financial performance of small firms depends not only on firm specific factors (our control variables), but also on market features and especially on a country's economic and political

risk and economic growth. This aspect has been thoroughly explored in market entry literature and with reference to the subsidiaries' performance but scarcely analysed with reference to overall international firms performance in general and to SME performance more specifically. With regards to SMEs, which are the special focus of our analysis, this aspect seems even more important. The peculiar lack of resources typical of small firms has been highlighted in many studies but our results prove that SMEs seem particularly affected by institutional features in general and political risk in particular. Institutional factors are one of the determinants of SME performance, more precisely the political hazard of the markets selected by a firm affects its results and, therefore, SMEs should make their market entry and eventually exit decisions very carefully even from this point of view. SMEs tend to enter in those countries that are more risky by the political point of view only if higher financial return is expected. Once controlling for the political risk factor SMEs performance is positively influenced by the economic stability of the countries that they selected. The overall conclusion seems to be that for SMEs the choice of the area in which to establish subsidiaries is a crucial one since this choice strongly influences their overall economic performance.

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