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# The effects of entrepreneurs' characteristics on internationalisation of gazelle firms: a case of Lithuania

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## ABSTRACT

In recent years so-called Gazelle firms or high growth firms (H.G.F.s) have been the interest of policymakers, however little is known about entrepreneur-level determinants affecting internationalisation of these firms. Thus, the research aims to extend the literature addressing the impact of entrepreneurs' characteristics on the internationalisation of H.G.F.s in Lithuania. The research sample was drawn from the population of Lithuanian H.G.F.s directly approaching the owners and members of the management team. The final sample included 177 internationalised firms. The analysis was based on the binomial logistic regression to test the hypotheses. The results reveal that entrepreneurial networks and foreign language capabilities of owners/managers are good predictors of internationalisation degree. However, the research confirms the decreasing effect of domestic ties, the higher degree of internationalisation. The research did not reveal the significance of entrepreneurial and managerial competencies of owners/managers for internationalisation success. Furthermore, the study did not support the relationship of owners/managers' education abroad and internationalisation. The research makes the twofold contribution to the extant literature. First, the research develops and tests the relationships surrounding the internationalisation of H.G.F.s as related to managerial and entrepreneurial competencies, entrepreneurial networks and international background of owners/managers. Second, the research highlights entrepreneur-level determinants affecting internationalisation of H.G.F.s in Central and Eastern European (C.E.E.) country's context.

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## 1. Introduction

High growth firms (H.G.F.s) demonstrate an exceptional contribution to employment, structural and economic change. The studies disclosed the impact of these firms on productivity, high innovation level and employment growth (Brown & Mawson,

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2016). These firms are attributed to a separate strand of small- and medium-sized enterprises (S.M.E.s) that demonstrate rapid expansion. In spite of representing a small business population, these firms attracted the attention of policymakers due to job creation capacity and consumer demand (OECD, 2013) and became a target of the E.U. support policy (Madelin & Ringrose, 2016). Referred to as ‘gazelles’ or ‘high impact firms’ these market players have been taking a significant place within economic development strategy (OECD, 2013).

H.G.F.s are perceived to be a phenomenon of the evolutionary nature of entrepreneurial capitalism. However, the studies observe that little is known about these type of firms (Brown & Mawson, 2016). While the researches on the interrelationship of H.G.F.s and the employment are more investigated (Henrekson & Johansson, 2010), the literature on the internationalisation of H.G.F.s is scant. The investigations performed in the U.K. and Germany revealed that internationalisation of high-tech startups leads to faster growth in comparison to the firms which only operate in the domestic market (Bürgel, Fier, Licht, & Murray, 2010). Meanwhile, the studies of the U.K. firms disclosed that international operations were significant for high growth (Mohr, Garnsey, & Theyel, 2014). Thus, the studies demonstrate reinforcing feedback effect of internationalisation and high growth. While a number of studies investigated firm-level drivers and barriers to growth (Pereira & Temouri, 2018), limited consideration was given to the owner/manager operating in the particular domestic context. The studies disclosed the significance of owner/manager for the firm’s growth and especially in international markets (Hansen & Hamilton, 2011). Contrary to the owners/managers of non-growing firms, the owners/managers of H.G.F.s demonstrated opportunity orientation and ambition, their education and prior industry experience were significant growth-related determinants (Hansen & Hamilton, 2011). The performance of these firms is believed to be linked to the capabilities and strategies adopted by the owners/managers. Thus, the understanding of owners/managers characteristics and the impact on the firms’ internationalisation appear to be a promising venue.

The majority of studies on H.G.F.s were performed in developed market context (Brown & Mawson, 2016; Mohr et al., 2014). However, the investigations in Central and Eastern European (C.E.E.) countries’ context are limited. While the studies investigated the R&D behaviour of the firms and the impact of institutional environment of C.E.E. countries on H.G.F.s (Pereira & Temouri, 2018), internationalisation of H.G.F.s is almost neglected. H.G.F.s are referred to be a backbone of the emerging economies that experienced substantial economic and political reforms since the 1990s. Though the rapid mass privatisation destroyed systems, grounded in centrally planned economies, C.E.E. countries lack strong institutional foundations (Wadhwa, McCormick, & Musteen, 2017). These obstacles determine that the overall environment of C.E.E. countries appears to be less attractive for entrepreneurship and international growth of small domestic firms (Korsakiene, Diskiene, & Smaliukiene, 2015). The entry to the E.U. positively influenced the institutional environment of C.E.E. countries (Dinçer, Yüksel, Korsakienė, Raišienė, & Bilan, 2019; Sekliuckiene, 2017) and contributed to a higher share of H.G.F.s in C.E.E. countries in comparison to developed countries (Pereira & Temouri, 2018). However, institutional effectiveness

remains a challenge for small firms that need to attract resources in the early stages of internationalisation.

Some C.E.E. countries are attributed to small and open economies with limited domestic demand. Therefore, internationalisation of H.G.F.s appears to be a necessity due to limitations of local markets. Lithuania, as a small open economy, is ranked 17th among the E.U. countries according to the Europe 2020 competitiveness index (The European 2020 Competitiveness Report, 2015). Though country's ranking has improved significantly and some barriers to entrepreneurship were removed, The Global Competitiveness Report 2017–2018 (2017) disclosed that tax rates, inefficient government bureaucracy, restrictive labour regulations, tax regulations and inadequately educated workforce are the main problematic factors for business in Lithuania. While 11% of all firms with at least 10 employees were attributed to high-growth firms in 2014, the growth of Lithuanian firms was mainly driven by outsourcing activities of international firms which have set up shared service centers (SBA Fact Sheet Lithuania, 2017). The trade sanctions between the E.U. and Russia remained an additional challenge for international expansion and forced the firms to seek opportunities in other markets. Meanwhile, extra-E.U. imports and exports of goods by S.M.E.s went down slightly in 2017 (SBA Fact Sheet Lithuania, 2017), what increased the concerns of both management and policymakers and encouraged to investigate internationalisation driven factors. Therefore, the research aims to extend the literature addressing the impact of entrepreneurs' characteristics on the internationalisation of H.G.F.s in Lithuania. The following research questions are addressed in the research: How does competence of entrepreneur influence the degree of internationalisation of H.G.F.s? Does the effect of entrepreneurial networks matter? What is the impact of the international background of the entrepreneur?

The article is structured as follows. First, the discussion on internationalisation and the role of the entrepreneur is provided, and the hypotheses are developed. The next section defines the research sample, variables and methods. The quantitative modelling approach leads to the exploration of the causal interrelationships between the effects of entrepreneurs' characteristics and the degree of internationalisation. The next section presents the research findings. Finally, discussion and conclusions are provided.

## **2. Theoretical background and hypotheses**

### ***2.1. Defining the high growth firm, internationalisation and the role of the entrepreneur***

The phenomenon of high growth firms – so-called gazelle firms – has gained full attention of scholars in the last few decades. However, the literature lacks a standard definition for this type of firm. Referring to the particular pace of growth, the scholars define gazelles as the firms with revenue of at least \$100,000 in a base year and a minimum of 20% sales growth every consecutive year (Henrekson & Johansson, 2010). Meanwhile, OECD (2013) definition refers to the gazelle firm as one with 10 or more employees and the greater than 20% annual growth of turnover or employees over a three-year period. It appears that suggested definition considers the impact of

H.G.F.s on the employment and thus neglects micro firms. The investigation performed by Henrekson and Johansson (2010) revealed that gazelles could be of all sizes. Thus, our research is guided by the assumption that H.G.F.s are the firms of all sizes that demonstrate more rapid growth than other firms in the industry.

The studies suggest that the firms which start international activities at an early stage of their development have more opportunities to become H.G.F.s (OECD, 2013). Furthermore, H.G.F.s adopt more aggressive forms of international expansion (Brown & Mawson, 2016). Thus, the reinforcing feedback effect of internationalisation and high growth is observed. While traditional internationalisation theories investigated well-established firms, a separate strand of international entrepreneurship research began to focus on young and small firms. The underlying assumption of international entrepreneurship literature is rapid and opportunity driven internationalisation which is shaped by the human capital of the entrepreneur (Ellis, 2011). Thus, human capital and experience appear to be critical intangible resources that lead to opportunity recognition, exploitation and value-enhancing strategies (Javalgi & Todd, 2011). In addition, the studies, grounded on upper-echelons theory and performed in small business context, confirmed that professional background and social capital of top managers affect strategic decision making in the firms (Wadhwa et al., 2017). The investigations observed the significance of owner/manager for H.G.F.s in international markets, distinguished his/her opportunity orientation and ambition, education and prior industry experience (Hansen & Hamilton, 2011; Hrubý & Hasilová, 2018). These arguments let us conclude that owners/managers of H.G.F.s play the vital role in the international expansion of the firm which is shaped by their personal characteristics. Thus, the next section is going to provide some insights grounded on the perspectives of entrepreneur's competence, entrepreneurial networks and international background in order to develop hypotheses.

## **2.2. Competence of the entrepreneur**

The literature has reached a consensus that the competencies required to establish and run small firms are qualitatively and quantitatively different from those needed to manage large companies (Mitchelmore, Rowley, & Shiu, 2014). While various debates on the concept of competency prevail in the scientific literature, our study assumes that competencies are the capabilities of entrepreneur and his/her team in acquiring, exploiting and developing resources for the purpose of business.

The studies revealed that both entrepreneurial and managerial competencies are significant in a small business context (Mitchelmore & Rowley, 2010). The classic entrepreneurial role is related to the observation of the environment, selection of opportunities and formulation of appropriate strategies (Chandler & Hanks, 1994). The competent entrepreneur should be able to identify and exploit opportunities within a specific context. In addition, entrepreneurs/managers have to acquire and utilise the necessary resources and thus must perform various tasks essential to a strategy implementation (Chandler & Hanks, 1994). Notably, managerial competencies are particularly relevant as the firm grows. These insights let us categorise competence of the entrepreneur as entrepreneurial and managerial competence.

While managerial and entrepreneurial capabilities were associated with both a higher probability of identifying more opportunities and pursuing more opportunities, the studies performed in international entrepreneurship context demonstrated mixed results. It appears that managerial experience significantly affects internationalisation propensity (Ganotakis & Love, 2012) what is explained by available awareness of owners/managers related to international opportunities, evaluation of available information and assessment of risk. Meanwhile, some studies did not support the evidence of a positive causal relationship, between managerial experience and internationalisation intensity, i.e., export activities from low to high (Ganotakis & Love, 2012), between management and start-up experience and export activities (Stucki, 2016). While recent investigations highlighted the importance of knowledge and skills of the H.G.F.'s staff for high growth (Demir, Wennberg, & McKelvie, 2017), it is reasonable to assume that entrepreneurs and her/his collaborators' competencies stimulate the international expansion of H.G.F.s. Thus, we hypothesise:

H1: There is a positive and significant association between entrepreneurial competencies of owner/manager and H.G.F.s internationalisation.

H2: There is a positive and significant association between managerial competencies of owner/manager and H.G.F.s internationalisation.

### **2.3. Entrepreneurial networks**

The attempts to investigate characteristics of entrepreneur have led to the idea, that entrepreneurs are tied through their relationships to the broader networks of actors. The assumption was grounded in the notion, that networks play the essential role in the emergence of organisations. Referring to social capital theory, we assume that entrepreneurial networks are a set of ties with the owner/manager at the center (Manolova, Manev, & Gyoshev, 2010). Thus, network effects can be conceptualised as the sum of the manager's relationships with others. The focus on entrepreneurial networks was grounded by few underlying assumptions (Ellis, 2011). First, the opportunity recognition is seen as a cognitive act. Second, interorganisational relationships are assumed to be a subset of all the ties held by owners and their collaborators. Entrepreneurial networks lead to valuable information. Thus, the relations with professional organisations and venture capitalists are the means for tapping into crucial market information or accumulation of financial resources.

In the international business studies, entrepreneurial networks have been described as a mean for international exchange opportunities. Thus, collaboration with internationally experienced domestic entrepreneurs may compensate for lack of experience and facilitate internationalisation processes. It appears that previous experiences and constant interactions of local entrepreneurs lead to trust and mutual respect faster than networking with international partners. The studies revealed that entrepreneurs in relatively open economies rely on social ties (Ellis, 2011). Thus, both strong and weak ties influence the internationalisation of S.M.E.s and have a positive impact on export intensity (Manolova et al., 2010). Meanwhile, some scholars assert that domestic ties with partners, focused on local markets, may hinder internationalisation (Leppäaho, Chetty, & Dimitratos, 2017). The individuals with local ties may lose

broader vision due to restricted information necessary for international expansion. However, it can be argued that local entrepreneurial networks are essential as both outcomes and inputs of the process. Based on the above-presented arguments, we hypothesise:

H3: There is a positive and significant association between entrepreneurial network effects of owner/manager and H.G.F.s internationalisation.

#### **2.4. The international background of the entrepreneur**

The studies emphasise that living and working abroad contribute to the perceptions of managers about global changes and teaches them how to adapt to these changes (Felício, Caldeirinha, & Rodrigues, 2012). Thus, international options appear to be significant methods of developing necessary competencies. The proponents of human capital theory assume that investments into skills and capabilities of individual increase economic performance and productivity ( Ganotakis & Love, 2012; Mauro, Migliori, & Paolone, 2017). These investments are possible through formal education or relevant experience. The appropriate education obtained by entrepreneurs allow to discover and exploit international opportunities, contributing to the higher performance of the firm. While the experience of individuals who have lived abroad significantly affected information gathering and decision-making behaviour, education abroad have led to the much easier expansion of their international activities (Felício et al., 2012). The studies focused on general and specific human capital through experience and education have raised the assumption that skills required to enter and to succeed in international markets are to some extent different (Ganotakis & Love, 2012; Mauro, Migliori, & Paolone, 2018; Otrisal and Pikner, 2018). However, the results of studies appear to be mixed. While some studies revealed that general education did not increase the probability of exporting (Ganotakis & Love, 2012), other studies disclosed that founders' education positively influenced export propensity and only university education significantly affected export intensity (Stucki, 2016). Based on the above-presented arguments, we hypothesise:

H4: There is a positive and significant association between education abroad of owner/manager and H.G.F.s internationalisation.

While linguists have explored the influence of language on international business, the impact of language was almost neglected. The explanation resides in the fact that English is assumed to be a standard corporate language. Though the literature reveals a lack of consensus considering foreign language skills and international success, the scholars emphasise that foreign language proficiency demonstrates international mindset and may lead to more 'general cultural sensitivity' of managers (Felício et al., 2012). The evidence suggests that proficiency of foreign language among small firms' staff determines how internationalisation is approached. The investigations revealed that linguistic ability influenced a positive use of export information. On the other hand, the scholars emphasise that the domain of languages and the resulting communication process facilitate the perception of international performance (Ellis, 2011; Felício et al., 2012). Thus, the firms from countries with languages that are little used

internationally have to respond to language differences from the earliest stage. Based on the above-presented arguments, we hypothesise:

H4: There is a positive and significant association between foreign language ability of owner/manager and H.G.F.s internationalisation.

### 3. Sample, variables, and methods

A survey method was used aiming to collect the research data. The sample consists of Lithuanian firms included in so-called Gazelle list and reported by leading business newspaper in Lithuania – *Verslo ziniuos*. Since 2003, a committee nominates the firms that achieve exceptional performance. The criteria for the nomination are as follows: profitability of the firm, the growth of turnover more significant than 20% over three consecutive years, a minimum turnover of 0.29–40 million E.U.R. in the base year, taxes paid on time and adopted good business practices. In addition, the openness of the firm and propensity to share the experience with others are considered as the essential criteria (Ziniuos, 2013). The information submitted by the firms is verified by the data of the State tax inspectorate.

A questionnaire was developed, and pilot testing was performed, aiming to assure the adequacy of the survey instrument. Three hundred and fifty-three firms were randomly selected from the Lithuanian Gazelle list. The data were collected in October–December of 2014 directly questioning the management of H.G.F.s. The owners and members of the management team were approached, in order to ensure that the respondent was with the firm when the firm started international activities. The firms had to be internationally active and independently owned. Of the 353 firms, 177 firms met our criteria. One firm was excluded because of missing data, which left us with 176 responses. That rate is similar to prior studies focused on the internationalisation of small firms (Javalgi & Todd, 2011) and entrepreneurial activities in transition economies (Wadhwa et al., 2017).

#### 3.1. Variables and measures

The degree of internationalisation (D.O.I.) was measured as export intensity, or foreign sales as a percentage of total sales. The scholars assume that international sales demonstrate the effectiveness of international activities (Manolova et al., 2010). Thus, referring to previous studies degree of internationalisation is considered when foreign sales represent more than 25% of total sales (Javalgi & Todd, 2011). The dependent variable takes the value of one if international sales are greater than 25% and zero if international sales are less than 25%.

The first independent variable, i.e., entrepreneurial competence was measured by a six-item scale (Chandler & Hanks, 1994). Though entrepreneurial competence was self-assessed, previous studies demonstrated the significance of those assessments with the firm's performance (Chandler & Hanks, 1994). The answers were given on a 5-point scale ranging from (1) weak to (5) excellent. The example statement is 'I accurately perceive unmet consumer needs.' The measures were summed aiming to calculate the E.C. variable. The example statement is 'I make resource allocation



decisions that achieve maximum results.’ The measures were summed aiming to calculate the M.C. variable.

Entrepreneurial networking was measured as the sum of an entrepreneur’s relationships with others (Manolova et al., 2010). The respondents had to indicate whom he/she approach when the need for advice appears. Following previous investigations, a list of eight occupations (accountant, friend, banker, another entrepreneur, consultant, professional association, relative, or other) was developed. The independent variable P.N. was calculated as the sum of all ties, indicated by the respondent.

Education abroad was measured by asking the respondents if their obtained education abroad or not. The measure let us form the E.A. variable.

The number of foreign languages measured foreign language ability. The number of foreign languages was grouped into three groups: (1) one foreign language; (2) two foreign languages; and (3) more than three foreign languages and let us form F.L. variable.

The control variables which may impact the degree of internationalisation were used in the study. There is evidence that industry influences the firm’s internationalisation (Manolova et al., 2010). Thus, grounded on the general statistical classification of economic activities in the E.U., each respondent was allocated to the following groups: (1) manufacturing, including recycling (N.A.C.E. section D); (2) wholesale trade and commission trade except motor vehicles, motorcycles (N.A.C.E. section G.51); (3) retail trade (exl. motor vehicles & cycles); repair personal and household goods (N.A.C.E. section G.52); (4) construction (N.A.C.E. section F); (5) sale, maintenance and repair of motor vehicles (N.A.C.E. G.50); (6)transport, travel agencies, post & communications (N.A.C.E. section I); and (7) other activities. At the industry level, we developed I.N. variable. As in previous investigations (Javalgi & Todd, 2011), we controlled for firm’s size using a number of employees. Notably, three groups of firms were distinguished: 1 – up to 10 employees; 2 – from 11 to 49 employees; 3 – from 50 to 249 employees and E.M. variable was developed. As previous studies have demonstrated that timing of market entry may influence internationalisation (Zhou, Wu, & Barnes, 2012), we controlled for the number of years between the firm’s establishment and any foreign sales. The firms, which start international activities within the first three years of operation, are assumed to be early beginners. Thus, the variable I.B. takes the value of one if the firms are early beginners and two if the firms are late starters. At the individual level, we controlled for gender (G.E.). Male respondents were assigned a value equal to one and female respondents were assigned a value equal to two. Finally, we controlled for respondents’ positions in the firm and developed (P.O.) variable. The following groups were distinguished: (1) owner; (2) director/general manager; (3) international business or export manager; and (4) another member of the management team.

### **3.2. Controlling for common method bias**

The data from our study are obtained from one source. Thus, following recommendations (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) we controlled for common method bias. Firstly, we used different response formats of the questions related to

predictor and criterion variables. In addition, we counterbalanced the order of the questions related to predictor and criterion variables in the questionnaire. Secondly, Harman's one-factor (or single-factor) test as a post hoc statistical analysis was applied.

### 3.3. Analytical approach

#### 3.3.1. Construct validity and reliability

Entrepreneurial and managerial scales were validated in previous studies. Reliability of both scales was tested by calculating Cronbach's alpha. Calculated Cronbach's alphas for entrepreneurial competence and managerial competence scales were 0.804 and 0.873, respectively. Cronbach's alpha values suggest that the items have relatively high internal consistency (Warner, 2013) and are in line with previous studies (Chandler & Hanks, 1994).

Construct validity was considered by exploring principal component factor analysis. The Kaiser-Meyer-Olkin (K.M.O.) test was used to check sampling adequacy. K.M.O. measure for E.C. variable and M.C. variable was 0.835 and 0.842, respectively. Moreover, Bartlett's test of sphericity was used to test the presence of correlations among the items of variables. The results disclosed that the Bartlett's test of sphericity was significant for E.C. variable (chi-square = 597.791, df = 5 and significance = 0.000) and M.C. variable (chi-square = 977.667, df = 15 and significance = 0.000). The varimax rotation with Kaiser normalisation identified items with strong loading to one component. The items of E.C. variable accounted for 50.95% of the variance. Meanwhile, the items of M.C. variable accounted for 61.29% of the variance.

#### 3.3.2. Hypotheses testing

The generalised linear models (G.L.M.s) are used for different forms and scales of the response and explanatory variables. Aiming to predict the degree of internationalisation, the analysis was based on the logistic regression model as a specific type of generalised linear models. The logistic regression model can be expressed in terms of  $p$  in the following way:

$$p = \frac{\exp(\beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \beta_3 X_{i3} + \dots + \beta_k X_{ik})}{1 + \exp(\beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \beta_3 X_{i3} + \dots + \beta_k X_{ik})}, \quad \text{where } 0 < p < 1. \quad (1)$$

where,  $p$  is a probability of internationalisation degree and can range from 0 to 1; the betas are the coefficients for the explanatory variables  $X_k$ .

The binomial logistic regression was used to model the relationships between the degree of internationalisation and explanatory variables. Notably, explanatory variables were discrete and continuous. For the goodness of fit statistics, we conducted the following tests: deviance which measures the discrepancy between the obtained model and the full model, the omnibus test and the Hosmer-Lemeshow test (Warner, 2013). In addition, the standard errors for the B coefficients were checked. None of the independent variables in this analysis had a standard error larger than 2.0. Thus, the issue of multicollinearity does not exist.

**Table 1.** Descriptive statistics and correlations.

	EM	IN	GE	FL	EA	IB	EC	MC	PN	PO	DOI
EM	1.000										
IN	-.156*	1.000									
GE	-.001	-.009	1.000								
FL	-.187*	.136	-.050	1.000							
EA	.062	.088	.026	.103	1.000						
IB	.002	.001	-.103	-.090	-.040	1.000					
EC	-.010	.128	-.184*	.094	.061	.027	1.000				
MC	-.019	-.080	.057	.145	-.001	-.025	.496**	1.000			
PN	.172*	-.123	-.128	.086	.197**	-.002	.069	-.044	1.000		
PO	.103	.124	.410**	-.101	.072	-.048	-.232**	-.174*	.025	1.000	
DOI	-.010	.062	.112	.156*	.087	-.368**	.023	.046	.131	.059	1.000
Mean	2.12	3.75	1.25	3.34	0.05	0.27	4.12	4.26	0.25	2.61	0.74
SD	0.707	2.912	0.436	0.692	0.229	0.448	0.703	0.629	0.918	1.684	0.439

Notes: D.O.I. = degree of internationalisation; E.M. = number of employees; I.N. = industry; G.E.= gender; F.L. = foreign languages; E.A. = education abroad; I.B. = intern. behaviour; E.C. = entrepreneurial competence; M.C. = managerial competence; P.N. = personal networking; P.O. = position in the firm; S.D. – Std. Deviation; \*\*p < 0.01; \*p < 0.05.

Source: Authors' calculation.

## 4. Results

The majority of firms in the sample represented manufacturing (34%), wholesale trade and commission trade (22%) and other activities (23%). About 49% of firms were small firms with 11–49 employees. The majority of firms (72%) started international activities within the first three years of operation. Most owners/managers were male (74%) and took the director/general manager position (40%). The results of the descriptive statistics and correlations among variables are presented in Table 1.

Descriptive analysis lets us gain some insights into the data. The degree of internationalisation was positively related to the ability of foreign languages and negatively related to the timing of market entry. The foreign languages were negatively associated with the number of employees. The entrepreneurial competence was negatively associated with the gender. The managerial competence was positively associated with the entrepreneurial competence.

Considering the nature of the dependent variable, we used the G.L.M. with *logit* linking function and additionally performed stepwise binary logistic regressions such as Forward Likelihood Ratio (LR) and Backward L.R. This approach let us compare different models and investigate significant predictors.

Appendix 1 presents the results of Binary logistic Backward L.R. model. The Nagelkerke's  $R^2$  suggested that the models explained from 45% (first model) to 38% (seventh model) of the variation. Meanwhile, Cox and Snell indicated lower values: from 30% (first model) to 26% (seventh model). While  $R^2$  values are approximations, their do not need to be overly emphasised. The obtained data are the most useful for the comparison of competing models. Thus, the largest  $R^2$  statistic suggests that the model is 'the best'. The Hosmer & Lemeshow test of the goodness of fit suggested that only four of seven models demonstrated a good fit to the data because their Sig. values were greater than 0.05 ( $p_1 = 0.124$ ;  $p_2 = 0.232$ ;  $p_4 = 0.111$ ;  $p_7 = 0.547$ ). The Omnibus Tests of Model Coefficients were used to check an improvement over the baseline model. The results demonstrated that the chi-square of each model was highly significant. Thus, all new models were significantly better.

Appendix 2 presents the results of Stepwise binary logistic regression Forward L.R. model. The graphical analysis of R.O.C. curves let us compare three competing classification models: Model\_1 Backward L.R., Model\_2 Forward L.R. and Model\_3 Enter (Appendix 3). The asymptotic significance of each model was less than 0.05. However, the confidence intervals revealed that the Model\_2 Forward L.R. demonstrated the lowest fit to the data as compared to other models (95% CI: 0.74, 0.89). Thus, the G.L.M. with a *logit* link function and Binomial probability distribution was used for two models: Model\_1 Backward L.R. (Control model) and Model\_3 Enter (Full model). The results are provided in Table 2.

The goodness of models fit was measured by deviance, the Akaike information criterion, corrected (A.I.C.C.), the Bayesian information criterion (B.I.C.), the -2 log likelihood and the tests of model effects (Type III) (Warner, 2013). Notably, the Control model's deviance/df = 1.025 and this measure was higher as compared to the Full model (deviance/df = 0.873). The A.I.C.C. was 182.93, and the B.I.C. was 243.51 for the Full model. Meanwhile, the A.I.C.C. was 90.28, and the B.I.C. was 123.62 for Control model. Though the smaller values were obtained for the Control model, the percentage of cases classified was high for both models (84.1% for the Full model and 79.0% for Control model). The obtained results let us conclude that the independent variables were good predictors of internationalisation degree.

Considering control variables, wholesale trade industry and sale, maintenance and repair of motor vehicles industry were found to have a substantial positive effect on internationalisation degree in both models. In the Full model for the case of the industry, the positive value was taken as equal to two ( $\beta_{IN=2}=2.411^{***}$ ), and the positive value was taken as equivalent to five ( $\beta_{IN=5}=2.535^{**}$ ). Similar values were observed in the Control model: the positive value was taken as equal to two ( $\beta_{IN=2}=1.685^{**}$ ) and the positive value was taken as equivalent to five ( $\beta_{IN=5}=1.742^*$ ). Thus, for the firms belonging to the wholesale trade and sale, maintenance and repair of motor vehicles industries we can expect higher internationalisation degree as compared to the other industries. The timing of market entry of the firms was very strong and positively related to the degree of internationalisation. In the Full model for the case of timing the positive value was taken as equal to zero ( $\beta_{IN=0}=2.250^{***}$ ), and in the Control model, the positive value was considered as equal to zero ( $\beta_{IN=0}=2.042^{***}$ ). Thus, the firms which start international operations from their inception achieve higher internationalisation degree.

In the Full model, both managerial competence and entrepreneurial competence were not significant. Meanwhile, these variables were excluded from the Control model. Thus, hypotheses H1 and H2 were not supported. However, personal networking was significant and negatively related to the degree of internationalisation ( $\beta_{PN}=-.129^{**}$  and  $\beta_{PN}=-.101^*$ ). The networking effect of owners/managers is decreasing while internationalisation degree is increasing. Thus, hypothesis H3 was partly supported. Considering education abroad, the results were not significant in both models, and the H4 hypothesis was rejected. Finally, the number of foreign languages was positively related to the degree of internationalisation. In the Full model for the case of foreign languages, the positive value was taken as equal to three

**Table 2.** Logisticks regression results.

Variables	Full Model coefficients			Tests of Full Model Effects Type III			Control Model coefficients			Tests of Control Model Effects Type III		
	B	S.E.	df	Variable	Wald Chi-Square	df	B	S.E.	df	Variable	Wald Chi-Square	df
(Intercept)	-3.786**	1.992	1	(Intercept)	.533	1	-2.980***	.635	1	(Intercept)**	4.469	1
[EM =1]	-.821	.716	2	EM	1.392	2						
[EM =2]	-.496	.535										
[EM =3]	0 <sup>a</sup>	-										
[IN = 1]	.409	.633	6	IN***	21.180	6	.283	.624		IN**	14.552	6
[IN = 2]	2.411***	.701					1.685**	.633				
[IN = 3]	1.561*	.979					1.165	.958				
[IN = 5]	2.535**	1.059					1.742*	1.013				
[IN = 6]	.722	1.313					.477	1.358				
[IN = 7]	-1.388	1.187					-1.379	1.217				
[IN = 8]	0 <sup>a</sup>	-					0 <sup>a</sup>	-				
[GE =0]	.455	.609	1	GE	.560	1						
[GE =1]	0 <sup>a</sup>	-										
[FL =2]	1.631**	.751	2	FL**	7.036	2	.991	.688		FL*	5.221	2
[FL =3]	1.153**	.498					1.083**	.488				
[FL =4]	0 <sup>a</sup>	-					0 <sup>a</sup>	-				
[EA =0]	.434	1.143	1	EA	.144	1						
[EA =1]	0 <sup>a</sup>	-										
[IB = 0]	2.250***	.464	1	IB***	23.516	1	2.042***	.445		IB***	21.040	1
[IB = 1]	0 <sup>a</sup>	-					0 <sup>a</sup>	-				
[PO =1]	.220	1.058	4	PO	6.694	4						
[PO =2]	.501	1.027										
[PO =4]	.415	1.108										
[PO =5]	-2.152*	1.315										
[PO =7]	0 <sup>a</sup>	-										
EC	.061	.044	1	EC	1.964	1						
MC	-.055	.043	1	MC	1.663	1						
PN	-.129**	.056	1	PN**	5.289	1	-.101*	.058		PN*	3.058	1
Deviance (value/df)				.873								
-2 Log likelihood				136.315								
Cox & Snell R Square				.304								
Nagelkerke R Square				.448								
Chi-square				12.651								
Overall % correctly classified				84.1								

Notes: \*\*\*p < 0.01; \*\*p < 0.05; \*p < 0.1.  
Source: Authors' calculation.

( $\beta_{FL=3}=1.153^{**}$ ) and in the Control model: the positive value was taken as equivalent to three ( $\beta_{FL=3}=1.083^{**}$ ). Thus, hypothesis H5 was supported.

## 5. Discussion and conclusions

Set in the transition from efficiency to innovation-driven C.E.E. country's context, the study investigated entrepreneur-related determinants, impacting the internationalisation of H.G.F.s. These firms appear to be significant contributors to employment, and thus, support of these firms attract the attention of policymakers. However, the literature on owners/managers' characteristics of H.G.F.s in C.E.E. countries context is less developed (Demir et al., 2017). Thus, we sought to gain understanding on entrepreneur driven determinants of these small and resource-poor firms.

Though the studies demonstrated the significant association of both managerial and entrepreneurial capabilities with a higher probability of opportunities' identification and exploitation (Mitchelmore & Rowley, 2010), our research did not disclose the significance of entrepreneurial and managerial competencies of owners/managers for internationalisation degree. Though entrepreneurial competence linked to the observation of the environment, selection of opportunities and formulation of appropriate strategies appears to be important in crucial stages of the firm's development, our results demonstrate that entrepreneurial competence does not predict higher internationalisation degree. This does not hinder the development of international orientation and does not prevent the international activities as such. On the contrary, we can expect that owners/managers with available entrepreneurial competence are more enthusiastic in identifying international opportunities, which may imply that international activities contribute to the firm's reputation in the domestic market. However, our study suggests that entrepreneurial competence per se does not guarantee successful internationalisation. In addition, the results confirm the assumption that the skills required to enter and to succeed in international markets are different (Ganotakis & Love, 2012). Thus, our results echo other investigations which found that prior entrepreneurial experience is not necessary for export activities (Stucki, 2016). Surprisingly, our study suggests that managerial competence does not predict internationalisation degree. While some studies confirmed the significance of managerial competence in performing various tasks related to the firm's strategy and growth (Chandler & Hanks, 1994), our findings echo other studies that did not disclose a definite causal relationship between managerial experience and internationalisation intensity (Ganotakis & Love, 2012).

In light of domestic networks, managers/owners of H.G.F.s rely on social ties, which help to develop international networks and assure internationalisation success. It appears that domestic ties compensate insufficient managerial competence necessary for successful internationalisation of H.G.F.s. The advice gained in domestic networks is seen as useful information that is important for international orientation, resource acquisition and growth. Contrary to other studies (Manolova et al., 2010), our study confirms that the effect of domestic ties decreases while internationalisation degree increases. Though the importance of personal networks in C.E.E. countries' context appears to be significant (Manolova et al., 2010), our

results demonstrate that international expansion diminishes the value of domestic ties. Consequently, higher internationalisation degree requires to expand international ties (Sekliuckiene, 2017).

Though initially expected, the findings did not support the relationship of owners/managers' education abroad and internationalisation degree. The studies that confirmed the interrelationship of general education and internationalisation intensity were focused on technology-intensive manufacturing industry (Ganotakis & Love, 2012) or start-ups (Stucki, 2016). Thus, the peculiarities of our sample let us suggest that in the case of H.G.F.s, operating in traditional industries, the situation is different. However, education abroad does not hinder international activities as such. On the contrary, education abroad shapes the global mindset of individuals (Felício et al., 2012) and is a source of both knowledge and motivation, contributing to opportunity identification.

Finally, in line with other studies (Ellis, 2011) the investigation supports the assumption that foreign language ability of owner/manager predicts the internationalisation degree of H.G.F.s. While foreign language ability contributes to the international mindset of owners/managers (Felício et al., 2012), our study suggests that the number of languages spoken by owner/manager appears to be essential for the firms from countries with languages that are little used internationally.

This study provides few contributions to the extant knowledge on H.G.F.s. First, the investigation extends current research on internationalisation of H.G.F.s in C.E.E. country's context. Second, the study complements the literature addressing the effects of entrepreneurs' characteristics on the internationalisation of S.M.E.s. Third, the study provides insights into H.G.F.s from small and open economies, such as Lithuania.

In spite of comprehensive analysis, the study has few limitations. First, cross-sectional investigation of H.G.F.s is acknowledged as the limitation of our study. Thus, the comparison of the data between two time periods or the longitudinal survey is seen as an extension of the study. Second, the industry classification of the study can be considered as too broad and thus, a narrower classification can be applied in the future studies. However, the narrower classification might lead to few cases per industry and subsequently, hinder the possibility to apply quantitative analysis. Third limitation is related to the constructs used in the research. For instance, the study considered only a few entrepreneur-related characteristics. Thus, future investigations have to add other characteristics prevailing in the extant literature (e.g. export-oriented skills and etc.). On the other hand, more diverse internationalisation variable (e.g. export propensity) has to be considered in the future. Furthermore, it would be possible to investigate how different entrepreneur-related characteristics influence export propensity and export intensity. Finally, the study was carried out in one country. Thus, the future studies could be extended in other countries, aiming to compare the obtained data.

The research offers a few practical insights for entrepreneurs and policymakers. The owners/managers of H.G.F.s are encouraged to broaden their domestic entrepreneurial networks, which compensate for insufficient managerial competence necessary for successful internationalisation. However, aiming to increase internationalisation degree the owners/managers have to consider the higher value of international

networks. Besides, foreign language abilities have to be assessed and compensated by additional training. The policymakers may facilitate international expansion of H.G.F.s through encouraging collaboration and alliances. Thus, the policies and programmes, aiming to promote internationalisation, have to be expanded towards the active development of international networks.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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## Appendix 1

**Table 3.** Backward L.R. binary logistic regression model summary and Hosmer–Lemeshow tests.

Step	–2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square	Hosmer and Lemeshow test		
				Chi-square	df	Sig.
1	136.315 <sup>a</sup>	.304	.448	12.651	8	.124
2	136.449 <sup>a</sup>	.304	.447	10.501	8	.232
3	137.615 <sup>a</sup>	.299	.440	16.406	8	.037
4	137.966 <sup>a</sup>	.297	.438	13.022	8	.111
5	139.335 <sup>a</sup>	.292	.430	17.436	8	.026
6	140.243 <sup>a</sup>	.288	.425	18.982	8	.015
7	147.519 <sup>a</sup>	.258	.380	5.937	7	.547

Source: Authors' calculation.

**Table 4.** The Step Summary<sup>a,b</sup> results of Backward L.R. binary logistic regression.

Step	Improvement			Model			Correct Class %	Variable
	Chi-square	df	Sig.	Chi-square	df	Sig.		
2	-.134	1	.714	63.660	19	.000	84.1 <sup>c</sup>	OUT: EA
3	-1.167	2	.558	62.494	17	.000	83.0 <sup>c</sup>	OUT: EM
4	-.351	1	.554	62.143	16	.000	83.0 <sup>c</sup>	OUT: GE
5	-1.369	1	.242	60.774	15	.000	82.4 <sup>c</sup>	OUT: MC
6	-.907	1	.341	59.866	14	.000	81.8 <sup>c</sup>	OUT: EC
7	-7.276	4	.122	52.590	10	.000	79.0 <sup>c</sup>	OUT: PO

Notes: <sup>a</sup>No more variables can be deleted from or added to the current model; <sup>b</sup>End block: 1;

<sup>c</sup>The cut value is .5.

Source: Authors' calculation.

## Appendix 2

**Table 5.** The Step Summary<sup>a,b</sup> results for Forward L.R. binary logistic regression.

Step	Improvement			Model			Correct Class %	Variable
	Chi-square	df	Sig.	Chi-square	df	Sig.		
1	25.170	1	.000	25.170	1	.000	76.1 <sup>c</sup>	IN: IB
2	15.511	6	.017	40.681	7	.000	79.0 <sup>c</sup>	IN: IN
3	7.352	2	.025	48.032	9	.000	76.7 <sup>c</sup>	IN: FL

Notes: <sup>a</sup>No more variables can be deleted from or added to the current model; <sup>b</sup>End block: 1; <sup>c</sup>The cut value is .5.

Source: Authors' calculation.

Appendix 3

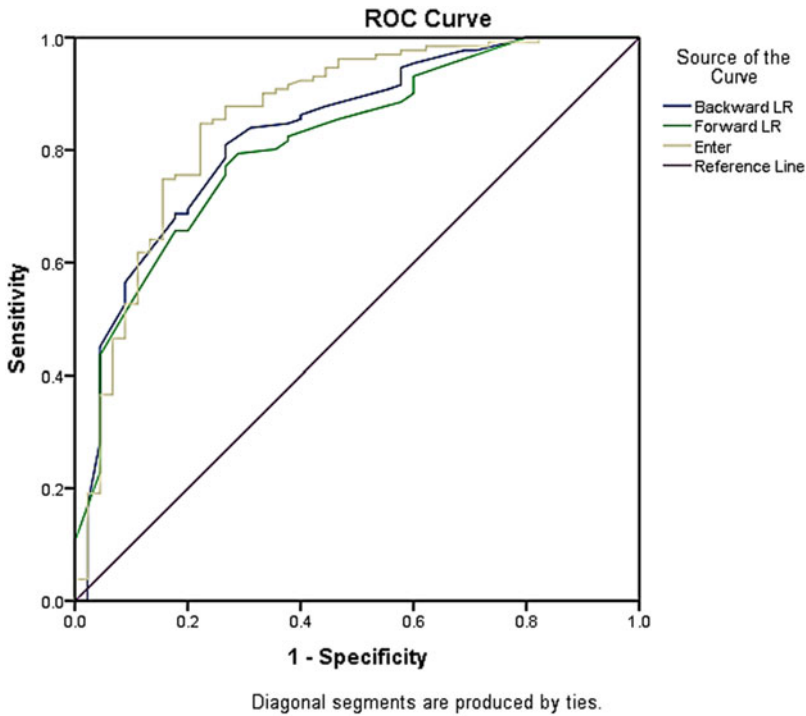


Figure 1. Graphical evaluation of models by R.O.C. curves.

Table 6. Area under the curve.

Test Result Variable(s)	Area	Std. Error <sup>a</sup>	Asymptotic Sig. <sup>b</sup>	Asymptotic 95% Confidence Interval	
				Lower Bound	Upper Bound
Model_1 Backward LR	.833	.036	.000	.763	.903
Model_2 Forward LR	.815	.036	.000	.744	.886
Model_3 Enter	.859	.036	.000	.789	.928

Notes: The test result variable(s): Model\_1 Backward LR, Model\_2 Forward LR, Model\_3 Enter has at least one tie between the positive actual state group and the negative actual state group. Statistics may be biased; <sup>a</sup>Under the nonparametric assumption; <sup>b</sup>Null hypothesis: true area = 0.5.

Source: Authors' calculation.