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Drivers and inhibitors of entrepreneurship in Europe's Outermost Regions: Implications for entrepreneurship education

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ABSTRACT

Governments of peripheral regions often seek to encourage entrepreneurship as a means of bolstering employment, typically charging higher education institutions with the task of delivering this mission through their entrepreneurship education programmes. This study investigates the drivers and inhibitors of entrepreneurial intentions among young people in Madeira, a semi-autonomous outlying region of Portugal. Data were collected from 352 final-year undergraduate students on management, economics and tourism courses. The adaptive Least Absolute Shrinkage and Selection Operator method was then applied to select the best predictors from among a large pool of potential covariates. The results found that students with less access to start-up finance and a greater fear of failure tended to have the least entrepreneurial intentions. Children of entrepreneurs had significantly stronger intentions to become entrepreneurs themselves. Entrepreneurial intention also increased significantly with the student's age. The paper concludes that entrepreneurial education providers in island economies firstly need to change the narrative that young people in peripheral regions receive about becoming entrepreneurs, particularly with regard to the greater vulnerability to business risks (the 'island penalty factor'), and secondly should provide practical support to students who do not have access to family business networks (a possible 'island bonus factor').

1. Introduction

Promoting entrepreneurship has frequently been proposed as a way of boosting employment in the Europe's Outermost Regions (ORs) (North & Smallbone, 2006). The ORs, which include the island territories of Madeira, the Azores and the Canary Islands, as well as other peripheral regions such as the overseas departments of France, have traditionally relied upon the public sector as their main generator of employment (Gay, 2012). The global economic recession that began in the early 2010s resulted, however, in a sharp reduction of public spending in most ORs, which caused unemployment to rise, especially among younger people (Berkowitz et al., 2015). Based on the belief that entrepreneurial potential is likely to be greatest among well-educated younger people (Shirokova, Osiyevskyy, & Bogatyreva, 2016), various governments have focused on promoting entrepreneurship among the younger generation (Adekiya & Ibrahim, 2016). The task of encouraging young people to consider an entrepreneurial career, and of providing them with the knowledge and practical skills to do so, has usually fallen to higher education institutions (Ndou et al., 2019).

Academic research into entrepreneurship has, meanwhile, concerned itself mainly with identifying the optimal mix of personal

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attributes and attitudes required to successfully establish and run a business. According to authors such as Harper (2003) and Cowling et al. (2012), however, entrepreneurial intention (EI) is determined not only by the personal characteristics and capabilities of the would-be entrepreneurs but also by the economic context in which they operate. This may be especially important in disadvantaged areas, as typified by the ORs, where greater vulnerability to economic shocks may discourage entrepreneurship (Booth et al., 2020; Parker et al., 2012; Smallbone et al., 2012). Family background may also have an important effect, in that people who have experienced an economic crisis and the hardships it brings – perhaps even the failure of their own family's business – may be less willing to adopt an entrepreneurial career (Zhang et al., 2014).

Entrepreneurship research has tended to neglect the ORs (Hermes & Mainela, 2014). The purpose of this paper is, therefore, firstly to explore the dynamics of entrepreneurship at the regional level, specifically in regions that might encounter various 'island effects' due to their small size and peripherality. In doing so, the paper secondly seeks to investigate how EIs may be shaped by economic conditions, which can be inconducive to entrepreneurship in ORs (what might be called an 'island penalty effect') Thirdly, the paper considers how far family background may affect EI, particularly in terms of access to networks that will permit young entrepreneurs to acquire advice, resources and contacts (what might be called an 'island bonus effect'). Fourthly, the paper will seek to identify the implications of these island effects for the design and implementation of entrepreneurship education (EE) in the ORs.

This focus of this study is on the OR of Madeira. Given the relative dependence of Madeira's private sector on tourism (Almeida & Machado, 2019), the focus will be on undergraduate students in the fields of management, economics and tourism studies. In doing so, the study aims to identify the key drivers and inhibitors of EI faced by such individuals. Many variables to reflect these factors have been proposed in the past, including internal factors (such as the individual's gender, family background and previous employment experience) and external factors (such as vulnerability to business risks). This requires a statistical technique that can achieve variable selection and parameter estimation simultaneously (Coad & Srhoj, 2020). The adaptive Least Absolute Shrinkage and Selection Operator (LASSO) method is employed for this purpose.

The next section of this paper presents a literature review considering the drivers and inhibitors of entrepreneurship intentions, the notions of island 'penalty' and 'bonus' factors, and the role of education in stimulating entrepreneurship. A section on methodology then follows, in which the context of Madeira is discussed, along with an explanation of the LASSO method, which will be used to achieve variable selection and parameter estimation concurrently. Sample selection and questionnaire design will also be discussed. Subsequent sections then present and discuss the empirical findings of the study. The final section concludes that those wishing to promote entrepreneurial intentions in island economies need to pay particular attention to the role played by so-called island 'penalty' and 'bonus' factors. Study limitations and suggestions for future research then complete the paper.

2. Literature review

Given that one of the purposes of EE is to increase EI among young people, the first sub-section of the literature review considers the drivers and inhibitors of EI. Effective EE will need to harness the drivers while attempting to overcome the inhibitors, and this is examined in the second sub-section of the review. These will need to take into account the particular context of ORs, so the third sub-section will consider contextual factors, which can be thought of as 'island bonus factors' and 'island penalty factors'.

2.1. Drivers and inhibitors of entrepreneurship intentions

Ajzen's (1991) well-established Theory of Planned Behaviour (TPB) has underpinned most research into EI (Liu & Zhao, 2021). The TPB proposes that three sets of factors determine an individual's desire to pursue any activity: personal attitudes, subjective or social norms, and perceived behavioural control (Fini et al., 2012). These factors have all been found to play a significant role in determining EI (Altinay et al., 2012; Chlosta et al., 2012; Kristiansen & Indarti, 2004; Maes et al., 2014). Studies using TPB have, however, found considerable variations in effects sizes. Subjective norms, for example, have been found to be a significant determinant of EI in some studies but not others (Krueger et al., 2000).

Other theories have therefore been elaborated to try to gain a better understanding of the forces that shape EI (e.g., Krueger et al., 2000; Mitchell et al., 2002). The remit of this paper is not to examine this broad array of theoretical approaches, for reasons that will shortly be made clear. It can, however, be noted that the broader determinants of EI can be grouped into two categories. The first comprises internal variables related to the personal attributes of the potential entrepreneur, such as age (Kristiansen & Indarti, 2004; Shirokova et al., 2016) and gender (Carr & Sequeira, 2007; Winn, 2005). With regard to age, the literature suggests that younger individuals are more likely to start a business (Santos et al., 2017; Vegetti & Adascalitei, 2017). The evidence on gender, meanwhile, points to a strong and persistent bias against females (Maes et al., 2014; Shirokova et al., 2016). Family background (Altinay et al., 2012; Chlosta et al., 2012; Kolvereid, 1996; Kristiansen & Indarti, 2004; Laspita et al., 2012; Matthews & Moser, 1995; Shirokova et al., 2016) and cultural norms also believed to play a strong determining role (Kristiansen & Indarti, 2004). Other internal variables that have been investigated include general educational background and prior experience of employment (Carr & Sequeira, 2007; Kolvereid, 1996). Having an educational background in the fields of management and economics tends to be associated with the higher likelihood of starting a new business (Vegetti & Adascalitei, 2017), while a certain reluctance has been detected among students of tourism and hospitality (Gurel et al., 2010).

Additional internal variables that have been found to be important include the presence of strong role models, particularly parents (Zhang et al., 2014), and the cultural norms of the community of which the would-be entrepreneur is a member (Adekiya & Ibrahim, 2016; Bae et al., 2014; Shirokova et al., 2016). The availability of assistance from one's family, friends and community has also been examined, including being given access to resources such as finance (Carr & Sequeira, 2007; Laspita et al., 2012), as well as business

contacts and customer lists (Berger & Kuckertz, 2016; Laspita et al., 2012). Other potential determinants include access to start-up capital through the formal banking system (Lüthje & Franke, 2003; Winn, 2005), and ease of access to government assistance in the start-up phase (Liñán et al., 2013; Ramos-Rodríguez et al., 2012). These are likely to vary according to the characteristics of the individual, such as their family situation (Winn, 2005), gender (Berger & Kuckertz, 2016; Winn, 2005), and so on.

The second group of factors comprises external variables. These include factors that shape investor confidence, including the state of the economic, political, cultural, and natural environments (Bruton et al., 2010; González-Pernía et al., 2015). Market expectations can be particularly important, with attitudes towards establishing a new business having been found to be sensitive to changes in real GDP per capita, interest rates, access to capital and unemployment rates (Fritsch et al., 2015; Koellinger & Thurik, 2012). It is argued that market opportunities are likely to be more limited in times of economic recession (Cowling et al., 2012; Smallbone et al., 2012). The focus of such analyses tends to be at the macroeconomic level, largely as a result of the lack of available data at the regional and local levels. Authors such as González-Pernía et al. (2018) and Sternberg and Rocha (2007) have, however, argued that entrepreneurship is primarily a regional phenomenon, since many critical contextual factors shaping EI and its associated behaviours operate at the regional level (Acs et al., 2015; Bishop & Shilcof, 2017). The literature suggests that the most decisive variables at the regional levels tend to be the rate of economic growth, the level of aggregate demand and the unemployment rate (Dohse & Walter, 2012).

There is thus a wide array of variables that may serve as antecedents of EE, and that EE research has still to explore how these might best be selected and arranged to provide a robust understanding of EI. It is also evident that the peripheral island economy context has not been fully explored in EI research. Indeed, there are likely to be particular benefits and costs associated with entrepreneurship in ORs, suggesting that a regional approach would be highly appropriate.

2.2. Island 'penalty' and 'bonus' factors

The regional context is believed to be particularly important in the case of ORs, which tend to be especially vulnerable to economic crises due to their peripheral situation and their tendency to depend on just a few economic sectors, often limited to the public sector, overseas finance and/or tourism (European Commission, 2022a; Ressurreição et al., 2022). ORs also share some common features that can significantly affect the rates of entrepreneurship they experience (European Commission, 2022b; Punnett & Morrison, 2006). These include a smaller domestic market, which leads to limited diversification and an over-dependence on imports (Ismeri, 2011). The limited domestic resource base, both in terms of natural resources and well-qualified workers, can hamper opportunity recognition by would-be entrepreneurs (Ismeri, 2011). Opportunity recognition may also be constrained by a narrow domestic output and export base, while established importers and wholesalers may benefit from critical market advantages (Poirine et al., 2017). Businesses operating in the ORs will usually face higher transport and communication costs (Baldacchino & Fairbairn, 2006). They may also be disadvantaged by the high degree of structural openness to international trade that tends to be maintained in ORs owing to their high dependence on imports (Hampton & Christensen, 2002). These disadvantages can be thought of as representing an 'island penalty factor' that must be negotiated by entrepreneurs in ORs.

As Baldacchino and Fairbairn (2006) point out, insularity is not a one-way street. Island economies may also exhibit features that might be considered to constitute 'island bonus factors'. Research is less plentiful, however, when it comes to establishing what these advantages for entrepreneurship might be. One candidate is the tendency for islands to exhibit kinship networks that are relatively more extensive and tightly knit. Cahn (2008), for example, argues that family networks can be important in providing start-up finance for would-be entrepreneurs in the form of remittances and family gifts. Entrepreneurs who are part of a strong family network may also be able to call upon family members to work for their business (Cahn, 2008). Baldacchino et al. (2008) extend this idea to friendship and social networks, suggesting that the greater density of such in the island context may open up greater entrepreneurial opportunities. Indeed, as Alsos et al. (2014, p. 115) state, "understanding the context for entrepreneurial growth requires a focus on the business-family nexus, as business decisions are influenced by both family circumstances and the economic conditions facing the business". In other words, island entrepreneurs may simultaneously experience both an 'island penalty factor' and an 'island bonus factor'.

2.3. The role of entrepreneurship education in stimulating entrepreneurship

Governments have often identified young adults as a target group among whom EI could be nurtured, and EE has typically been viewed as the best vehicle to achieve this. The effectiveness of EE in stimulating EI has been widely examined in the entrepreneurship literature (e.g., Fayolle & Liñán, 2014; Gurel et al., 2010; Maresch et al., 2016; Ndou et al., 2019; Souitaris et al., 2007). Many of these report significant positive effects of EE on EI, although the effects sizes tend to vary considerably between contexts.

A meta-analysis of studies by Martin et al. (2013) found a small positive link between EE and EI. Bae et al.'s (2014) meta-analysis, however, suggested that while a small-but-significant effect could be detected between EE and EI, this effect dropped away once any EI established before the EE took place was taken into account. The small effect size of EE on EI is of concern, as it suggests that EE, as it currently designed and practiced, may not be effective in supporting students' EI. This is particularly concerning in the peripheral island context, where EE has often been viewed as a means of supporting entrepreneurship as an alternative to wage-based employment. A better understanding of the drivers and inhibitors of EI is required so that EE courses can be better designed and implemented.

The purpose of this paper is, therefore, to identify the antecedents of EI in peripheral island regions and to explore the implications of such for the design and practice of EE. The specific context of ORs suggests that there are dynamics at work that are not sufficiently captured by existing research into EI. Recognising and understanding these dynamics, and designing and practicing EE accordingly, is

vital if the potential for EE to help address the economic problems faced by such regions are to be realised.

3. Methodology

3.1. Context

Madeira has been selected as the OR for this study for four main reasons. First, Madeira is a good example of an OR. It is an island archipelago located in the North Atlantic and is an Autonomous Region of Portugal, a member state of the EU. The service sector accounts for 86.2% of its GVA, while the tourism sector accounts for 16.7% of all employment.

Second, Madeira's economy faces severe challenges. Following Portugal's accession to the European Community in 1986, Madeira experienced two decades of almost uninterrupted economic growth, fuelled by a continuous inflow of funds from European programmes (Ismeri, 2011). Largely as a result, Madeira experienced one of the lowest unemployment rates anywhere in Europe. Since 2010, however, Madeira has been experiencing periods of sluggish growth (Ismeri, 2011). This is due not only to two major natural disasters that severely damaged the region's infrastructure but also to the IMF's intervention in Portugal, which required Madeira to make major cutbacks in public spending and to introduce controls on the recruitment of personnel and contractors (Cadima et al., 2020; Carneiro et al., 2014). Faced with simultaneous endogenous and exogenous shocks, Madeira abruptly found itself in the midst of a public-debt crisis (Ruel, 2015).

Third, Madeira has experienced a high level of youth unemployment. With a large proportion of the workforce employed in the public sector, unemployment rose quickly during the public-debt crisis, peaking at 51.5% in 2013 and then falling to around 25.3% in 2019. As is common in ORs, the incidence of unemployment fell disproportionately on young people (Gay, 2012; Ismeri, 2011), encouraging many young people to emigrate to find work elsewhere. Entrepreneurship has therefore been viewed as a means of easing youth unemployment and halting the emigration of young people.

Fourth, the potential of EE to generate EI among young adults is not being fully exploited in Madeira. Recent high levels of unemployment encouraged many young people to go back into education to wait for the situation to improve and obtain qualifications in the meantime that would increase their chances of gaining employment in the wage-based economy (DREM, 2023; Ramos & Alves, 2017). While many took EE courses, the entrepreneurship rate remained stubbornly low (DREM, 2023). This has resulted in a large cohort of unemployed people in their thirties who are considered educationally overqualified but with low, or no, EI (DREM, 2023).

3.2. Methodological approach

In terms of the general methodological approach adopted, this study employed an exploratory, data-driven method based on the LASSO technique (Coad & Srhoj, 2020). This semi-supervised method made it possible to analyse the impact of a wide range of variables, with the aim of identifying those that are most conducive to encouraging EI. LASSO has the potential to produce superior results to conventional, hypothesis-based analyses. One possible reason for this could be the methodology conventionally employed, which tends to rely upon the researchers using 'scientific judgment', guided by extant theory, to select the covariates used in the statistical model. While this approach is very common, the risk of overlooking potentially significant variables cannot be understated (Bunea et al., 2011).

Another controversial issue relates to the potential for 'overfitting' to occur when using conventional ordinary least squares regression (Ranstam & Cook, 2018). This method normally involves the stepwise selection of variables, often using standard errors and p-values as criteria for variable retention (McNeish, 2015). Stepwise variable selection will lead to the model's goodness-of-fit and

Table 1
Variable set used in the LASSO analysis.

Socio-demographic	Attitudes towards obstacles
Gender	Financial risk
Resident in Funchal	Fear of failure
Age>21years	Lack of capital to start a business
Final mark	Funding difficulties
Studying Economics or Management	Lack of knowledge on business opportunities
Contextual	The current economic and political situation
Employment public sector	Lack of support from family and friends
Employment private sector	Lack of entrepreneurial capacity
Self-employed	High fiscal burden
Unemployed	Long working hours
Mother is an entrepreneur	Lack of competence in HR management
Father is an entrepreneur	Particularly high responsibility
Previous experience	Lack of business ideas
Know an entrepreneur	High risk of bankruptcy
Employment experience	Lack of training/poor training
Participation in training activity	Capabilities and training
Aiming at creating something new	Assessment of capabilities
Family member as a businessman/woman	Course is helping me to be an entrepreneur
Bankruptcy following economic crisis	University is encouraging entrepreneurship

regression coefficients being exaggerated, while standard errors and p-values are understated. This results in a loss not only of authenticity and generalisability, but also of parsimony: the final model will include variables that only appear to contribute to its efficiency, while excluding some that do not appear to contribute to its efficiency but actually do. LASSO can overcome the overfitting problem through a process of regularisation. Rather than minimising the loss function directly, LASSO employs a penalised loss function using a penalty coefficient (also known as the tuning parameter or lambda value).

LASSO includes a data-driven procedure to supervise variable selection (Belloni & Chernozhukov, 2011; Konzen & Ziegelmann, 2016). This can imitate more complex decision-making behaviours than conventional modelling techniques, including the way individuals tend to make decisions under time pressure by focusing on the most powerful and easily interpretable determinants of a problem, and simply ignoring the rest (Zhang et al., 2019). This process, known as ‘rational inattention’ (Abel et al., 2013; Luo & Young, 2016) may appear irrational in that it ignores potentially useful information, proponents argue that acquiring and using information has an economic cost, so the rational decision-maker focuses their attention only on the most salient data (Huang & Liu, 2007; Zhang et al., 2019). Forming and acting upon EI may be considered an instance of such.

Models that employ data shrinkage have been used with some success in social sciences, particularly in applications where there is a large array of potential covariates to work with, in which case multicollinearity is likely to be a problem (Kapinos & Mitnik, 2015). Several researchers have employed LASSO in the field of entrepreneurship studies (e.g., McKenzie, 2017). None, however, has addressed the research questions established for the present study. Instead, the focus has tended to be on predicting enterprise performance and survival.

For the present study, a logit regression was conducted with LASSO penalisation (see STATA, 2021) using a pool of 40 potential predictors of EI (see Table 1). To determine the penalty factor (lambda), a tenfold cross-validated error plot of the LASSO model was constructed. In line with the standard practice, the optimal lambda was determined by choosing the most regularised and parsimonious model within one standard error of the minimum.

3.3. Sample selection

Final-year university students are commonly subjects of research on the field of entrepreneurship literature. This is because they will have experienced two to three years of their study programme, maximising their exposure to any EE element, whilst they are also

Table 2
Basic statistics.

Socio-demographic background	
Age (years)	21
Gender	
Male	42.9%
Female	57.1%
Place of residence	
Funchal	44.9%
Other counties	55.1%
Parents' professional background	
Father is a businessman	17.5%
Mother is a businesswoman	4.5%
Both parents are businessmen/businesswomen	6.0%
At least one parent is working in the public sector	42.0%
At least one parent is working in the private sector	39.0%
At least one parent is self-employed	15.0%
At least one parent is unemployed	17.0%
Other	10.0%
Did any member of your family file for bankruptcy owing to the economic crisis?	12.5%
Area of studies	
Management	48.0%
Tourism	34.0%
Economics	18.0%
Intentions in terms of their future career development	
Internship	29.5%
To establish one's own company	9.7%
Safe job	28.1%
Part-time job	1.1%
Any type of job	7.4%
Continue studies	26.7%
Respondent's exposure to entrepreneurship	
Did you get to know someone that has created his own company?	79.3%
The person concerned, is a family member?	55.1%
Do you have an employment experience (internship, fixed-term job, etc)?	59.1%
Did you ever participate in a entrepreneurship related training activity?	42.6%
Would you like to work on a project aiming at creating something new?	89.2%
Would you like to start up your own company?	83.0%
Is any member of your family a businessman/businesswoman?	58.0%

about to graduate, at which point any EIs may be converted into entrepreneurial behaviours. Accordingly, the sample frame comprised all 352 final-year students attending courses in economics, management and tourism at the University of Madeira in the academic years 2018-19 and 2019-20. No inducement (such as monetary payment or additional course credits) was used to encourage participation. The completion rate was approximately 80%.

3.4. Questionnaire design

The questionnaire used to collect the data began by asking respondents to indicate what they intended to do immediately after graduation. Response options included taking an internship, establishing one's own company, finding a traditional full-time job, finding a part-time job, finding any type of job, and continue with their studies.

All respondents were then asked a set of standard questions about their socio-demographic and family circumstances. The latter included whether at least one member of their extended family owned their own business, whether at least one parent had their own business, whether they knew an entrepreneur outside their family, and if they knew anyone who had started their own business. In order to establish whether the 2011 economic crisis had a serious adverse impact on their family, respondents were asked if any family member had applied for bankruptcy in the last decade.

Respondents were then asked to make a self-assessment of their ability in various entrepreneurial skills (Zhao et al., 2005) and their entrepreneurial exposure (Guerrero & Pena-Legazkue, 2013; Santos et al., 2017). The variable 'training in entrepreneurship' was then used to indicate whether the respondent thought that training in the field would encourage them to start a business.

Respondents were next asked whether they had already undertaken or performed various start-up-related activities. The list of activities, intentional actions and training sessions was based on Zhao et al. (2005), Santos et al. (2017), and Guerrero and Pena-Legazkue (2013) and included aspects such as 'developing a network of professional contacts' and 'writing a business plan'.

Entrepreneurs will inevitably face many risks and uncertainties on their way to establishing their start-up business (Kuratko & Hodgetts, 2004). Perceptions of the degree of difficulty associated with pursuing an entrepreneurial activity can be of great importance in ORs (Kang and Xiang, 2021). Respondents were therefore asked to rank the degree of risk associated with various common difficulties such as 'fear of failure' and 'lack of knowledge of business opportunities', based on lists in Lüthje and Franke (2003) and Shirokova et al. (2016).

4. Results

Table 2 shows that 48% of respondents were studying management, with 24% studying tourism, and 18% enrolled in economics. Around 57% were female. Most were aged between 18 and 21, with an average age of 21. Regarding career aspirations, 29.5% intended to secure a place as a trainee as soon as they graduated. Fewer than 10% intended to establish their own company as soon as they graduated, while just over 28.1% expressed an interest in finding a 'safe' job with good job security. More than 26% intended to go on to study a master's degree, while 7.4% stated that they were desperate to get any kind of job.

Regarding their parents' profession and occupational experience, 42% indicated that at least one parent was a civil servant, 15% were self-employed, 39% worked in the private sector, and 17% were job seekers. More specifically, 17.5% of the respondents indicated that their father owned a business, 4.5% reported that their mother owned a business, and 6% stated that both parents had their own business (es). Almost 80% were familiar with someone who had started their own company. In just over 55% of such cases, this was a family member. About 58% said that a member of their extended family had their own business. Nearly 60% had employment experience of some kind, such as an internship, or a job with a fixed-term or permanent contract. Nearly 43% said they had participated in an entrepreneurship training session.

When asked if they would 'like to work on a project aiming at creating something new?', almost 90% of respondents replied in the affirmative. Nevertheless, fewer than 10% said they would make the effort to establish their own business in the near future. When

Table 3
Obstacles and constraints.

Risk/difficulty	Mean	St. Dev.
Financial risk/risk of losing money	5.653	1.418
Lack of equity capital to start a business	5.605	1.336
Funding difficulties	5.406	1.339
Lack of knowledge on business opportunities and customers	5.011	1.448
High risk of bankruptcy in the current economic climate	4.987	1.540
The current economic and political situation	4.957	1.417
High fiscal burden	4.941	1.487
Lack of business ideas	4.866	1.548
Lack of training/poor training in the area	4.843	1.755
Fear of failure	4.636	1.699
Lack of entrepreneurial capacity	4.588	1.604
Particularly high responsibility	4.501	1.862
Lack of competence in HR management	4.409	1.620
Long working hours	3.884	1.840
Lack of support from family and friends	3.679	1.782

asked if ‘any member of your family [had] filed for bankruptcy owing to the economic crisis?’, 12.5% replied in the affirmative. As such, only a small minority had been directly or indirectly affected by the 2011 economic crisis.

Respondents were, even so, well aware of the difficulties involved in starting a business (Table 3). When asked to what challenges would pose a major threat to their EI, respondents considered ‘financial risk/risk of losing money’ to be the most important, followed by ‘lack of equity capital to start a business’ and ‘current lack of knowledge on business opportunities and customers’. ‘Lack of support from family members and friends’, ‘long working hours’, the current ‘economic and political situation’ and the ‘high risk of bankruptcy in the current economic climate’ were also frequently acknowledged.

Respondents’ perceptions of the strength of their own capability to become successful entrepreneurs can be important in compensating for their perceptions of the barriers. Table 4 shows that respondents ranked their skillsets in a relatively generous manner (mean = 4.8). It is notable that the ten best-ranked abilities relate to rather generic capabilities, such as inter-personal and communication skills, self-motivation and to the capacity to relate to people and to gain their confidence. Among the lowest ranked, meanwhile, were more practical entrepreneurial tasks such as developing/creating new products and services, commercialising new ideas or developing products, and identifying a business opportunity.

In terms of concrete experience, Table 5 shows that only about 37% had ever discussed ideas about products and/or business ideas and only around 36% had ever collected information about markets and competitors. Only 24% reported that they had some experience in writing a business plan. In interpreting these figures, it should be remembered that many of the students will have taken courses where such skills were taught.

Table 6 presents the output of the LASSO model, based on the adaptive method. A parsimonious model was selected, representing an efficient selection of the variable pool. It is notable that several variables often put forward as key drivers of a positive attitude towards entrepreneurship were found not to be important in this analysis. The p-value of the variables ‘knowledge of someone who has created his/her own company’, ‘interest in being involved in a new project’, and ‘family member working as an entrepreneur’, each of which were selected by LASSO, were found to be greater than the 0.05 threshold in a simple logit model testing the variables identified. These variables were excluded from the final model. The other variables identified by LASSO were in accord with *a priori* expectations in terms of the signs and statistical significance of the estimates. Overall, the predictive power of the logit model derived from the LASSO methodology was relatively high (0.1934). Moreover, all the variables included in the model were statistically significant, in line with previous associations and causal effects predicted by the literature.

Age increased the likelihood of the respondent having EIs. For each additional year of age, a 18% increase in the log-odds of intending to become an entrepreneur was found, holding all other independent variables constant. Those on undergraduate courses in economics and management were found to have significantly greater EI than those studying tourism.

Respondents with greater fear of failure and less likely to have access to finance tended to have lower EIs. When all other parameters were set at their mean values, the probability of expressing EI fell continuously from 53.19% to 27.79% as the variable ‘fear’ ranged from ‘not important at all’ ‘to extremely important’. A similar pattern (from 57.34% to 31.47%) applied to respondents’ concerns about their ability to raise financing.

Variables relating to respondents’ family backgrounds were found to be among the most important in this study. For example, the probability of a student who indicated that their father pursued a business career stating that they wanted to become an entrepreneur was 143.9% (nearly two and a half times) greater than those whose father was not pursuing a business career. Meanwhile the probability of having entrepreneurial aspirations was 68.2% for respondents who had the least concern about the risk of failure but who lacked an entrepreneurial family context, while the corresponding probability for respondents who shared the same lack of

Table 4
Students’ perceptions of key competences.

Critical competences	Mean	St. Dev.
To work in a team	5.474	1.279
Ability to relate to other	5.356	1.344
To assign tasks and responsibilities	5.315	1.177
Coordinate people and tasks	5.251	1.210
To defend my own ideas	5.240	1.246
To solve problems and present solutions	5.116	1.215
Communicate with efficacy	5.011	1.294
To be a leader and communicator	4.966	1.381
Organise and planning activities	4.848	1.217
To deal in an effective manner	4.838	1.219
To manage successfully a new product	4.830	1.186
To commercialise and sell products	4.801	1.331
To think creatively	4.741	1.272
To gather the resources needed	4.693	1.218
To make a business presentation	4.656	1.399
Identification of business opportunity	4.483	1.181
Manage the one’s firm innovative process	4.423	1.177
To develop a network of professional contacts	4.415	1.335
To commercialise a new idea or development of a product	4.331	1.218
To make marketing related numeric analysis	4.173	1.431
Development/creation of new products/services	3.972	1.188

Table 5
Experience in critical tasks (%).

Discussing ideas about products and/or business with potential clients	37.22
Collecting information about markets/competitors	36.65
Writing a business plan	24.15
Starting the development of a products/service	24.43
Carrying out marketing/promotions related actions	20.74
Buying raw materials, equipment, machinery to start a business	21.31
attempt/actions to get external funding	10.80
Patent registration, copyright, trademark	5.40
Registering a company	9.94
Getting training in the area of entrepreneurship at the university	19.32
Getting training in the area of entrepreneurship outside the university	23.30

Table 6
LASSO model results.

Method	lambda	No. of non-zero coef.	Out-of-sample dev. ratio	CV mean deviance	No. of covariates
CV	.0213352	18	0.1188	1.180256	36
Adaptive	.066785	10	0.1382	1.154216	36
Plugin	.0256984	17	0.1218	1.176239	36

	Coef.	Std. Err.	Z	P>z	[95% Conf. Interval]	
Parent self-employed	1.872803	.2722989	6.88	0.000	1.339107	2.406499
Fear of failure	-.1702359	.077633	-2.19	0.028	-.3223937	-.0180781
Age	.1876226	.0726574	2.58	0.010	.0452166	.3300285
Degree of exposure	.4251985	.3876901	1.10	0.273	-.3346602	1.185057
Funding difficulties	-.1852415	.1009025	-1.84	0.066	-.3830067	.0125237
Family member	.3828472	.2998744	1.28	0.202	-.2048959	.9705902
Economics, management	.5412396	.2805559	1.93	0.054	-.0086399	1.091119
Interest in a project	.6568552	.4881714	1.35	0.178	-.2999432	1.613654
Father entrepreneur	.8850948	.3363955	2.63	0.009	.2257717	1.544418
Constant	-4.780471	1.669971	-2.86	0.004	-8.053553	-1.507388

concern with failure but who could call upon family support was 81.8%.

5. Discussion

This study presents some findings that are important for EI in Madeira and, indeed, more widely. The first is that an anticipated lack of availability of wage-based employment is not a strong driver of EI. Respondents were, indeed, generally optimistic about finding a good job in the wage economy soon after graduation. Many suggested that if they failed to find wage employment, they would apply for an internship or enrol in a postgraduate degree. The importance attached to the obstacles faced when establishing a business in a peripheral island economy, along with the need to gain skills and experience before attempting to overcome such obstacles, might help to explain this result. In the case of Madeira the lack of availability of wage employment would not be considered to part of a putative ‘island penalty factor’. This is not to suggest, however, that an island penalty factor does not exist: merely that an anticipated shortage of wage-based employment is not part of its make-up in the case of Madeira.

The results of this study do, however, support the presence of an island penalty factor when it comes to fear of failure as an inhibitor of EI. Would-be entrepreneurs’ fear of failure was a major determinant of EI for most respondents in this study, corresponding with the findings of studies by [Minniti and Nardone \(2007\)](#) and [Langowitz and Minniti \(2007\)](#). Fear of failure may be associated with low EI in peripheral island economies because of their tendency to be more exposed to international market forces. In the absence of government policies to insulate the economy, this leaves their domestic businesses intrinsically more vulnerable to market risks, exposing entrepreneurs to greater risks. It may also reduce potential entrepreneurs’ alertness to market opportunities and thus their ability to exploit them ([Koellinger et al., 2013](#); [Mancilla & Amorós, 2015](#)). Peripheral island economies may thus be poorly disposed to nurture EIs, indicating the presence of an island penalty factor which militates against entrepreneurial activity.

A strong association was also found between respondents’ family background and their EIs. Previous studies have highlighted the importance of an entrepreneurial family background in shaping entrepreneurial intentions ([Kolvereid, 1996](#); [Maes et al., 2014](#); [Matthews & Moser, 1995](#)). The results of the present study also correspond with previous studies suggesting that knowing an entrepreneur, either from within or outside of the family, tends to increase EI ([Altinay et al., 2012](#); [Liu & Zhao, 2021](#)). The entrepreneur may serve as a role model for the would-be entrepreneur, allowing them to emulate their attitudes and behaviours. The family member or friend may also serve as an important source of advice and encouragement. This result is supported by a study conducted by [Mohan \(2022\)](#) of entrepreneurship in small-island states, which found a strong relationship between the individual having a role model and holding EIs. It can be argued that this effect is likely to be stronger in peripheral island economies, where it is more culturally acceptable for a child to ‘follow in their parent’s footsteps’. It may, as such, be part of an island bonus factor, which serves to enhance EI

in peripheral island economies.

It is notable, meanwhile, that one of the strongest effect sizes in this study related to whether the respondent's father owned his own business. The same was not true of whether the mother was an entrepreneur. A study by [Maes et al. \(2014\)](#), however, found that entrepreneurial role models tend to be of the same sex as the would-be entrepreneur.

Parents and family friends who are entrepreneurs can also provide would-be entrepreneur with access to valuable networks of interpersonal relationships, from which they can receive advice, recommendations, further business contacts and resources ([Moog et al., 2015](#)). Such networks may be the source, for example, of start-up capital, which is often difficult for young entrepreneurs to acquire due to their lack of collateral and track record. It can further be argued that ORs often have more tightly knit communities, which provide a dense network of connections in this respect, and this might be considered to be part of an island bonus factor in the context of EIs.

Children of entrepreneurs are also often expected to help out in the family business during busy periods, particularly in tourism-based economies where labour shortages are common in the main season. Working in the family business may provide young people not only with on-the-job training in entrepreneurship skills and knowhow, but also an opportunity to experience the entrepreneurial lifestyle before they have to commit to it for real after graduation. This may boost their EI and may thus be seen as part of a possible island bonus effect.

Tourism students were less interested in pursuing entrepreneurial careers. Management and economics students tend to have more exposure to business issues in their courses than other students ([Maresh et al., 2016](#); [Kuckertz & Wagner, 2010](#)), which helps them to evaluate entrepreneurial opportunities. [Ndou et al. \(2019\)](#) indicate that tourism students have lower levels of competences, skills and innovativeness needed in the initial phases of a business venture. To increase tourism students' interest in entrepreneurship, therefore, it is important that they be given access to modules and training that increases their levels of confidence. This could include courses in starting a business and how to obtain start-up funding.

6. Conclusions

This study makes a number of novel contributions to understanding the determinants of EI among young adults. Family background was found to have the most decisive impact on forming their EI. The strong family links within islands may thus point to a possible 'island bonus factor'. Necessity, due to lack of wage-based employment opportunities, was not found to be highly influential. This can be associated with the difficulties inherent to entrepreneurship in island economies and points to a possible 'island penalty factor'. These findings, in turn, have important implications for the design and implementation of EE courses in peripheral islands, including Europe's ORs.

6.1. Theoretical contributions

The findings suggest that being adversely affected by a previous economic crisis was not a significant determinant of respondents' EI. Moreover, respondents did not view the persistently high rate of youth unemployment to be a reason to be pessimistic about their job prospects in the wage-based economy. As such, and contrary to the findings of previous studies ([Afi et al., 2022](#); [Cervelló-Royo et al., 2020](#); [Civera et al., 2020](#); [Li et al., 2020](#)), necessity was not found to be a significant driver of EI. The explanation can possibly be found in the perceived range and magnitude of the risks involved in establishing one's own business, problems in finding start-up capital, and insufficient access to business contacts and customers. If these risk factors are perceived to be particularly high, young people may not adopt entrepreneurial careers, even if there is no alternative wage-based employment available. This may indicate the presence of what can be thought of as an 'island penalty factor', which may serve to suppress the formation of EIs in peripheral island economies.

Family background proved to be the most important determinant of EI. Factors such as having one or both parents who were themselves pursuing entrepreneurial careers, and knowing people who had started their own businesses, were important and significant determinants of EI among respondents. This may relate particularly to the 'on-the-job' experiences would-be entrepreneur have while working in the family business, as well as to their future ability to use family members' business network to access advice, recommendations and resources such as start-up capital. The children of entrepreneurs were more likely to have EIs, largely because of the advantages associated with coming from an entrepreneurial background. A strong inter-generational effect was therefore found ([Lindquist et al., 2015](#)). This may suggest an 'island bonus factor' at work. Whether this effect is particularly associated with smaller, more tightly knit island communities such as Madeira remains, however, to be formally established ([Baldacchino, 2008](#)).

6.2. Practical contributions

The inclusion of EE in university courses is increasingly being viewed a policy mechanism for promoting entrepreneurship ([Abreu et al., 2016](#)). This study confirms that EE can play a key role in nurturing and supporting EI among university students in peripheral islands, although not necessarily in the forms in which it is currently practiced. There seems, indeed, to be a gap between what is needed and what is actually taught.

EE curriculum designers therefore need to think more critically about how far their teaching suits the context in which it is being delivered. In view of the perceptions of the risks associated with entrepreneurship in peripheral island regions, EE should broaden its focus from delivering knowledge and intellectual skills, to increasing students' confidence in operating in a volatile economic environment ([Ndou et al., 2016](#)). Courses should provide opportunities to practice solving real-world problems in practical ways, so that

students can acquire relevant entrepreneurial skills and abilities. This will enhance student's feelings of internal control (Harper, 2003). EE should also focus on how to cope psychologically with the ever-present threat of failure associated with operating an enterprise in a peripheral island economy.

Family background can have a decisive effect on EI. To be more effective, therefore, EE programmes need to ensure they are assisting those without such family backgrounds to develop not just entrepreneurial 'know-how' but also entrepreneurial 'know-who'. Indeed, Souitaris et al. (2007) suggest that good practice should be to include a mix a classic 'taught' components on the basics of entrepreneurship with an 'interaction with practice' component to allow students to contact practitioners and attend networking events. EE programmes should provide students with access to market-research resources, meetings space, access to the developers of products and technology with commercial potential, and perhaps even seed funding (Souitaris et al., 2007).

The findings of this study also suggest that older students are more likely to form strong EIs. The remit of EE should therefore be extended to include former alumni who wish to undertake further training to prepare themselves for an entrepreneurial career. This would ideally be after they have spent a reasonable length of time in employment to avoid them becoming reliant on higher education as a refuge from the jobs market.

With respect to targeting students taking specific subjects, it might be tempting for decision makers to target students taking tourism courses, particularly in view of the frequent desire among governments to diversify the tourism sector. EE courses directed at tourism students should, however, go beyond simply focusing on standard subjects and generic understandings of entrepreneurship, to concentrate on more practical topics such as business plan preparation, identification of opportunities, practical training in coping with risks and fears, and so on. They need to be as specific and grounded as those offered to business and management students, if not more so.

6.3. Limitations

LASSO is fundamentally a data-reduction technique. Some researchers may consider this a limitation of the technique because variable selection is not directly driven by theory. Proponents of LASSO would argue, in response, that many so-called hypothesis-driven analyses are overfitted, particularly when variables are extracted in a stepwise manner from a large initial model. LASSO models are also arguably more generalisable because of their use of regularisation to exclude variables that do not contribute to the efficiency of their fit. It can be argued, therefore, that even though this study uses data from Madeira, the conclusions are likely to be appropriate for other European ORs and, indeed, peripheral regions worldwide.

6.4. Recommendations for future research

Three major recommendations for further research flow from this study. First, it would be helpful to identify the size of the 'island penalty factor' faced by Madeira and other island ORs, in order to compensate for this in the provision of start-up funding programmes and other support for independent businesses. Efficient support will need to both overcome any island penalty factor and provide an additional incentive for people to start their own businesses.

Second, and in the same vein, it would be helpful to identify the size of any 'island bonus factor' associated with the closeness of the community in small island economies such as Madeira. The results of this study suggest that access to existing business networks is an important factor in determining EI. Governments may wish to support such networks to increase their efficiency. EE should focus on helping students without an entrepreneurial family background to gain access to existing networks or, if necessary, to start building their own.

Third, research is needed into EE curriculum design and implementation to ensure that is tailored to regional circumstances. In outlying regions, for example, it may be necessary to include more training on personal resilience. How best to incorporate this in existing EE provision is an important area of pedagogic research that should be pursued.

CRedit authorship contribution statement

António Almeida: Methodology, Investigation, Formal analysis, Data curation, Conceptualization, Writing – original draft. **Brian Garrod:** Conceptualization, Writing – original draft, Writing – review & editing.

Data availability

Data will be made available on request.

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