Perceptions about the existence of plenty of good opportunities for the creation of new firms

Aldina Correia, Vasco Bento, Eliana Costa e Silva and Vítor Braga

Abstract—This essay consists in a statistic study of a database from the Global Entrepreneurship Monitor (GEM), specifically the 2011 GEM National Expert Survey (NES) individual data and aggregated data. The GEM project consists in a multinational effort to interview thousands of individuals from different countries with the intention to create a database to study the relationship between entrepreneurship and the economic growth. GEM's conceptual framework depicts the multifaceted features of entrepreneurship, recognizing the proactive, innovative and risk responsible behaviour of individuals, always in interaction with the environment, in order to uncover factors that encourage or hinder entrepreneurial activity, especially related to societal values, personal attributes and the entrepreneurship ecosystem. GEM provides a platform for assessing the extent to which entrepreneurial activity influences economic growth within individual economies and uncover policy implications for the purpose of enhancing entrepreneurial capacity in an economy. To analyse this database a Factor Analysis (FA) and a Multivariate Linear Regression (MLR) were used. The goal is to understand the entrepreneurship expert's perceptions in three fulcrum areas related to funding a business (financial aid, governmental politics and governmental programs) to new and growing firms. Are also analysed these perceptions about the existence of plenty of good opportunities for the creation of new firms.

Keywords—GEM, Entrepreneurship, NES, Factor Analysis, Multivariate Linear Regression.

I. INTRODUCTION

THE Global Entrepreneurship Monitor (GEM) measures individuals perceptions to entrepreneurship, their involvement in entrepreneurial activity and their aspirations in doing so. This information, based on primary data collection among representative samples of adult individuals, is complimented with expert assessments on entrepreneurial framework conditions. Taken together and using other data sources like those mentioned above, it allows exploration of the impact of national institutions on entrepreneurship, as well as the relationship between entrepreneurship and economic development. This powerful annual international observatory on entrepreneurship was initiated by academics from London Business School in the United Kingdom and Basbon College in the United States in 1997, as per D. J. Kelley, S. Singer and M. Herrington in [7]. This manual summarizes the GEM conceptual framework in 2015/16 years, that guides the GEM data collection, highlights the key methodologies adopted in the Global Entrepreneurship Monitor and provides some documentation and practical issues to its two key data sources:

- The GEM Adult Population Survey (APS);

- The GEM National Expert Survey (NES).

The most recent data resealed by GEM at its website is NES2013. In this study NES2011 was considered. The 2011 GEM survey represents the 13th year that GEM has tracked rates of entrepreneurship across multiple phases and assessed the characteristics, motivations and ambitions of entrepreneurs, and the attitudes societies have toward this activity. The report from the 2011 survey, autored by D. J. Kelley, S. Singer and M. Herrington in 2012 [5], covers results based on 601 economies completing APS and 62 economies completing the NES. NES provided data on the Entrepreneurship Framework Conditions (EFC's) and the variables corresponding to the opportunities, knowledge, culture, intellectual property, gender conditions, etc., in their own countries and/or regions, as said by Correia et. al. in [2] and [3], in 62 economies, using a Likert scale from 1 (highly insufficient) to 9 (highly sufficient). According to Kelley et. al. in [5] globally, physical infrastructure received the highest rating, with values above 6. The weakest conditions, with values below 4, can be seen in school-level entrepreneurship education, internal market burdens and R&D transfer. The GEM teams assess the quality of their entrepreneurship ecosystems through the NES, acoording to the same authors in [7]. In this report the authors affirms that the aim of these reports is to inform academics, educators, policy makers and practitioners about the multidimensional nature of entrepreneurship around the world. Improvements and stability in GEM measures from year to year can demonstrate the value of long-term commitments by policy makers and public and private stakeholders in effecting changes and providing needed resources for building more supportive entrepreneurship ecosystems. It is GEM's goal to advance knowledge about entrepreneurship and guide decisions that can lead to the conditions that allow entrepreneurship to thrive.

In this work we will analyse the GEM NES individual database using Factor Analysis (FA) and a Multivariate Linear Regression (MLR).

Having into account Yong & Pearce, [9], the broad purpose of FA is to summarize data, so that relationships and patterns can be easily interpreted and understood. It uses mathematical procedures for the simplification of interrelated measures to discover patterns in a set of variables and regroup variables into a limited set of clusters based on shared variance. Hence, it helps to isolate constructs and form concepts about the data, as said by Marôco in 2011 in [6]. We use this method when analysing large datasets that consist of several variables that can be reduced by observing "groups" of variables. It is useful for studies that involve a few or hundreds of variables like the GEM data, which we want to analyse. Using FA we can

reduced the data to a smaller set, to get at an underlying concept, and to facilitate interpretations. It is easier to focus on some key factors rather than having to consider too many variables that may be trivial, and so FA is useful for placing variables into meaningful categories.

The GEM NES aggregated data is a comparative file in which each row represents a country (or a region), and provides medians, means, standard deviations for each item of the original closed data for each nation (or region), plus the means and standard errors of the summary variables and the percent of multiple responses of the opened questions. These last, are coded thanks to a list of topics that facilitates the identification of the issue highlighted by the original textual response (according with Kelley et. al. in [5]).

We also used multivariate linear regressions in order to identify the factors/variables that explain the expert's perceptions about the existence of plenty of good opportunities for the creation of new firms in their countries.

II. SAMPLES AND DATA RECOVERY

In the GEM NES Global Data Individual level and GEM NES Aggregated Nations, the main variables are qualitative in the first database and both qualitative and quantitative in the second, they take some categories that are ordered or ranked. Thus, having into account Marôco in [6] and Howell in [4], any measure of central tendency become more suitable for use than others. In ordinal variables the best measure of central tendency is the median and mode. The mean gives us the arithmetic mean of a set of values, or the sum of all values of a variable, divided by the total number of observations. Only suitable for scalar variables. The median is a central value of the distribution of a number or separating the upper half of a data sample, a population, or a probability distribution, from the lower half. Suitable for ordinal and scalar variables. And, the mode is the value that appears most frequently in the data set. The calculation is indicated for nominal, ordinal and scale variables. For the present study, the variables that were considered were the following:

X1 NES11_A01 In my country, there is sufficient equity funding available for new and growing firms.

X2 NES11_A02 In my country, there is sufficient debt funding available for new and growing firms.

X3 NES11_A03 In my country, there are sufficient government subsidies available for new and growing firms.

X4 NES11_A04 In my country, there is sufficient funding available from private individuals (other than founders) for new and growing firms.

X5 NES11_A05 In my country, there is sufficient venture capitalist funding available for new and growing firms).

X6 NES11_A06 In my country, there is sufficient funding available through initial public offerings (IPOs) for new and growing firms.

X7 NES11_B01 In my country, Government policies (e g , public procurement) consistently favour new firms.

X8 NES11_B04 In my country, new firms can get most of the required permits and licenses in about a week.

X9 NES11_B05 In my country, the amount of taxes is NOT a burden for new and growing firms.

X10 NES11_B06 In my country, taxes and other government regulations are applied to new and growing firms in a predictable and consistent way.

X11 NES11_C01 In my country, a wide range of government assistance for new and growing firms can be obtained through contact with a single agency.

X12 NES11_C02 In my country, science parks and business incubators provide effective support for new and growing firms.

X13 NES11_C04 In my country, the people working for government agencies are competent and effective in supporting new and growing firms.

X14 NES11_K01 In my country, there are plenty of good opportunities for the creation of new firms

The variables are common to both databases. This data was selected because it gives us an understanding of the experts opinion in the principal areas related to funding a business: financial aid, governmental politics and governmental programs, to new and growing firms, according with the objective of this work.

The different type of expert in NES 2011 are Entrepreneur (727 experts corresponding to 39.3% of the total of answers); Investor, Financer or Banker (172 experts – 9.3 %); Policy Maker (284 experts – 15.3 %); Business and Support Services Provider (350 experts – 18.9 %); Educator, Teacher or Researcher (230 experts – 12.4 %), as considered by Correia et. al. in [2] and [3].

Is also an objective to study the answers for the question X14 – NES11_K01 – "In my country, there are plenty of good opportunities for the creation of new Firms", in order to study expert's perceptions in this subject.

III. DESCRIPTIVE ANALYSES

In order to perform a descriptive analysis for the variable X14 – NES11_K01 – "In my country, there are plenty of good opportunities for the creation of new Firms", which is a qualitative variable, underwent a transformation to: 1. Completely false; 2 - Somewhat false; 3 - Neither true nor false; 4 - Somewhat true; 5 - Completely true.

Considering the GEM NES Global Data Individual level, it appears that for this question, 1821 answers of the respondents are considered valid cases and 31 cases are absent. The answer "Somewhat true" was given by 750 respondents representing 40.5% of the population, 392 answered "Neither true nor false" (21.2%), 343 responded "Completely true" (18.5%), 276 answered "Somewhat false" (14.9%) and 60 of the responses were "Completely false" (3.2%). Then 60% of the population Inquired consider that in their country there are many good opportunities for the creation of new businesses.

The descriptive statistical information on the variable under study was also observed. For that we consider the variable as qualitative continuous despite it being ordinal qualitative. The mean of the responses values is 3.57 (Somewhat true), the class value that appears most frequently, i.e. mode is 4 (Somewhat true) and the median is 4.00, i.e. 50% of the population surveyed answered "Somewhat true" or less. Since the average is below the median, it can be concluded that the data

distribution is slightly skewed to the left. The standard variable deviation is 1.060 and the variance is 1.123. Calculating the symmetry coefficient of the distribution we obtained the value -8.95, and it is confirmed that the distribution is negatively asymmetric. The value of kurtosis coefficient is -4.09, then it is concluded that the distribution is platikurtic.

IV. Variables Association

The verification of the correlation between variables becomes essential to qualify the direction and intensity of assotiation between them, according to Marôco, [6].

This existence of association is fundamental for FA performing. Having into account that the variables are not continuous the same transformation considered for X14 is needed for all variables. Thus before that, we can consider that they are ordinal qualitative variables.

Considering, for example the variable X3 NES11_A03 – "In my country, there are sufficient government subsidies available for new and growing Firms" and the variable X7 NES11_B01 – "In my country, Government policies (and e.g., public procurement) consistently favour new Firms", in order to investigate the association between them. After analysing the contingency table, it is concluded that there seems to be associations between X3 and X7 variables. However, to confirm the Chi-square test was used, which dictates the association between the variables. Pearson Chi-Square value is 273.234, with 16 degrees of freedom (df) and asymptotic significance value of approximately 0. So there is a statistical evidence to reject the null hypothesis and concluded that the variables are not independent and to consider there is an association between them. To test the strength of the association we used the the R Spearman test and the Kendall's tau b coefficient and Kendall's tau c. Both measures show that the association is weak but positive (0.331, 0.282 and 0.260 respectively), because they are positive values close to zero and statistically significant, because the significance level is less than 0.05.

Similar results are obtained when all variables in the study are considered. All the associations are significant, weak and positive, when the R Spearman test is considered.

If we consider the variables as continuous, Pearson correlations are all significant to, but, once the normality is not verified with Kolmogorov-Smirnov and Shapiro-Wilks tests, we considered the nonparametric tests above. These results for normality tests may be a consequence of the large sample size. As is know big samples conduct to a failure of these tests. If we want to consider the normality we can use the Limit Central Theorem. This assumption was considered for the application of the FA and MLR, in the next sections, that are parametric techniques, assuming the normality of the variables.

V. Factorial analyses

Factor analysis is a multivariate statistical technique, looking through a set of variables, the identification of base variation dimensions. The aim is to reveal existing structures, but are not observable directly, as refered by Yong in [9]. To test whether it is suitable for applying factorial analysis of the

TABLE I
Rotated Component Matrix

		Components		
	MSA	1	2	3
X1	0.851	0.785		
X2	0.839	0.724		
X5	0.853	0.715		
X4	0.864	0.664		
X6	0. 881	0.625		
X3	0.928	0.498		
X11	0.883		0.783	
X12	0.857		0.715	
X13	0.892		0.666	
X7	0.927		0.362	
X9	0.802			0.831
X10	0.826			0.782
X8	0.877			0.526
% of Variance		33.565	12.618	8.195
Cronbach's α		0.798	0.674	0.658

set of 13 variables referred above and analyse if those variables are significantly correlated, Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy was used. This measure can vary from 0 to 1 representing the degree of explanation of the databased on the identified factors. Values lower than or equal to 0.5 are considered inadequate to the application of the analysis. Bartlett's sphericity test, testing the hypothesis that the correlation matrix is equal to the identity matrix is also used.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy for this sample and data is 0.867, a value is relatively high, indicating a good adequacy of the sample to perform FA, according to Marôco [6]. The Chi-Square value for Bartlett's Test of Sphericity is 4410.299, with 78 df and a significance of approximately 0. Then Bartlett's sphericity test shows us that the variables are significantly correlated, then there is statistical evidence to reject the null hypothesis at a 5% significance level, and it can be considered that the factor analysis is useful in estimating common factors. In order to assess the adequacy of factor analysis of the variables studied, the Correlation Matrix Anti- Image was analysed indicating the factors explaining power in each of the variables. The bottom of the diagonal matrix (Anti-Image Correlation) contains adequacy measures for each variable, which values are above 0.5, then it is not therefore necessary to remove any variable for the study, as we can see in Table I.

To decide how many factors to extract, it was used as an indicator the number of eigenvalues greater than the unit. Analyzing the scree plot (Graphic 1), it was found that three factors were extracted, using Principal Component Analysis.

These three factors explain 54.38% of total variance, as can be seen in Table I, where the rotated Varimax with Kaiser Normalization, matrix is also presented.

In order to analyse the reliability of the factors the Cronbach's Alpha Statistics are calculated, depicted in Table I. According with Pestana and Gageiro, 2009, [8], the measures indicates a plausible consistency of the measures.

The interpretation of the results shows that there are three factors that can be considered has favour or constraint factors for the development of activity and/or entrepreneurial initiative. Thus, **Factor 1** consists of variables related to the

availability of financial resources, equity and funds for new and growing businesses, including grants and subsidies,and can be called "**Financial Support**" and the variables that compose it are:

X1 – "In my country, there is sufficient equity funding available for new and growing firms".

X2 – "In my country, there is sufficient debt funding available for new and growing firms".

X3 – "In my country, there are sufficient government subsidies available for new and growing firms".

X4 – "In my country, there is sufficient funding available from private individuals (other than founders) for new and growing firms".

X5 – "In my country, there is sufficient venture capitalist funding available for new and growing firms)".

X6 – "In my country, there is sufficient funding available through initial public offerings (IPOs) for new and growing firms".

Factor 2 is to be called "**Government Policies**" because it is composed of variables that relates the degree to which government policies relating to taxes, regulations and their enforcement, are neutral with regard to company size and degree to which these policies encourage or discourage new and growing companies and the variables that compose it are:

X7 – "In my country, Government policies (e.g., public procurement) consistently favor new firms".

X11 – "In my country, science parks and business incubators provide effective support for new and growing firms".

X12 – "In my country, the people working for government agencies are competent and effective in supporting new and growing firms".

X13 – "In my country, a wide range of government assistance for new and growing firms can be obtained through contact with a single agency".

Finally **Factor 3** is composed of three variables about bureaucracy and taxes for new businesses and/or growth and can have the name of "**Bureaucracy and taxes**". The variables that compose it are:

X8 – "In my country, new firms can get most of the required permits and licenses in about a week".

X9 – "In my country, the amount of taxes is NOT a burden for new and growing firms".

X10 – "In my country, a wide range of government assistance for new and growing firms can be obtained through contact with a single agency".

VI. MULTIVARIATE LINEAR REGRESSION

With these multivariate linear regression, it is aimed to observe which variables influence the opinion of the 1852 individuals, on their perception about plenty of good opportunities for the creation of new Firms in their countries. Two models are considered. The first one consider the factors defined in the previous section as independent variables, the second one as the goal to identify the most important variables in the study which influences the dependent variable, which is the perception about plenty of good opportunities for the creation of new Firms in their countries.

TABLE II
MODEL SUMMARY

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
22	0.724	0.524	0.512	0.734	1.924

Then, the dependent variable is X14 NES11_K01 – "In my country, there are sufficient government subsidies available for new and growing Firms". Initially all NES variables considered in the previous analysis is included using the scores as independent variables. The model to be tested is:

$NES11\_K01 = \beta_0 + \beta_1 \times Factor1 + \beta_2 \times Factor2 + \beta_3 \times Factor3$

$NES11\_K01 = \beta_0 + \beta_1 \times Financial\ Support + \beta_2 \times Government\ Policies + \beta_3 \times Bureaucracy\ and\ taxes$

This model has an adjusted R Square of, approximately, 0.057=5.7%, meaning that it is the expected percentage of the total variability in the perception level about the existence of plenty of good opportunities for the creation of new Firms explained by the independent variables included in the adjusted linear regression model.

The independent variables used in the FE are all also considering order to analyse which more affect the expert's perceptions about plenty of good opportunities for the creation of new Firms in their countries. But the quality of the model is similar to the previous one.

Thus, all NES variables included in the Entrepreneurial Framework Conditions (EFCs) (from NES_A1 to NES_I05) and the other variables (from NES_K01 to NES_R06) are used as independent variables. The choice of dependent variables to consider in the analysis was made based on an exploratory analysis. Afterwards, it was necessary remove some of them, using a stepwise method.

The final model, which model summary is presented in Table II, was obtained at the twenty-second iteration and has an adjusted R Square of, approximately, 0.512=51.2%, meaning that it is the expected percentage of the total variability in the level of expert's perceptions about plenty of good opportunities for the creation of new Firms in their countries explained by the independent variables included in the adjusted linear regression model. These variables are:

NES11_K02 In my country, there are more good opportunities for the creation of new firms than there are people able to take advantage of them;

NES11_K05 In my country, there are plenty of good opportunities to create truly high growth firms;

NES11_I04 In my country, the national culture encourages creativity and innovativeness;

NES11_K03 In my country, good opportunities for new firms have considerably increased in the past five years;

NES11_C01 In my country, a wide range of government assistance for new and growing firms can be obtained through contact with a single agency;

NES11_C03 In my country, there are an adequate number of government programs for new and growing businesses;

NES11_H02 In my country, it is not too expensive for a new or growing firm to get good access to communications

(phone, Internet, etc.);

NES11_N02 In my country, the Intellectual Property Rights (IPR) legislation is efficiently enforced;

NES11_G06 In my country, the anti-trust legislation is effective and well enforced;

NES11_M04 In my country, you will often see stories in the public media about successful entrepreneurs;

NES11_A05 In my country, there is sufficient venture capitalist funding available for new and growing firms);

NES11_I05 In my country, the national culture emphasizes the responsibility that the individual (rather than the collective) has in managing his or her own life;

NES11_E03 In my country, new and growing firms can afford the latest technology;

NES11_F05 In my country, it is easy for new and growing firms to get good banking services (checking accounts, foreign exchange transactions, letters of credit, and the like);

NES11_F01 In my country, there are enough subcontractors, suppliers, and consultants to support new and growing firms;

NES11_B04 In my country, new firms can get most of the required permits and licenses in about a week;

NES11_A01 In my country, there is sufficient equity funding available for new and growing firms;

NES11_A03 In my country, there are sufficient government subsidies available for new and growing firms;

NES11_B02 In my country, the support for new and growing firms is a high priority for policy at the national government level;

NES11_Q05 In my country, government programs are highly selective when choosing recipients of entrepreneurship support.

The coefficients of the final model are presented in Table III. This table also shows the unstandardised and standardized coefficients. Such results show that all dimensions considered in the final model, obtained by stepwise method, are significant to explain the expert's perceptions about plenty of good opportunities for the creation of new Firms in their countries.

Thus the coefficients of the final model are presented in Table III and the model can be written as below:

$NES11\_K01 = 0.45 + 0.35 \times NES11\_K02 + 0.24 \times NES11\_K05 + 0.11 \times NES11\_I04 + 0.11 \times NES11\_K03 - 0.10 \times NES11\_C01 0.08 \times NES11\_C03 + 0.09 \times NES11\_H02 - 0.08 \times NES11\_N02 + 0.11 \times NES11\_G06 + 0.09 \times NES11\_M04 - 0.10 \times NES11\_A05 - 0.09 \times NES11\_I05 + 0.08 \times NES11\_E03 - 0.09 \times NES11\_F05 + 0.08 \times NES11\_F01 + 0.05 \times NES11\_B04 + 0.07 \times NES11\_A01 - 0.08 \times NES11\_A03 + 0.08 \times NES11\_B02 - 0.06 \times NES11\_Q05$

Although, all dimensions were considered as significant, some variables display more importance in the model than others. The analysis of standardised regression coefficients shows that the variables NES11_K02 and NES11_K05 are those that show a higher relative contribution to explain the dependent variable.

This leads to conclude that experts agree that the variables that are mostly associated with the expert's perceptions about the existence of plenty of good opportunities for the creation of new Firms are a lack of people able to take advantage

TABLE III
COEFFICIENTS OF THE LINEAR REGRESSION

Model	Coefficients					Collinearity Statistics	
	Unstandardized		Stand.	t	Sig.		
	β	Std. E	β			Tol.	VIF
(Constant)	0.45	0.15		3.03	0.00		
NES11_K02	0.35	0.03	0.38	12.67	0.00	0.71	1.42
NES11_K05	0.24	0.03	0.26	7.78	0.00	0.58	1.73
NES11_I04	0.11	0.03	0.12	3.86	0.00	0.62	1.61
NES11_K03	0.11	0.03	0.11	3.63	0.00	0.63	1.60
NES11_C01	-0.10	0.03	-0.11	-3.37	0.00	0.65	1.55
NES11_C03	0.08	0.03	0.09	2.51	0.01	0.49	2.05
NES11_H02	0.09	0.02	0.10	3.64	0.00	0.87	1.15
NES11_N02	-0.08	0.03	-0.10	-2.91	0.00	0.57	1.75
NES11_G06	0.11	0.03	0.12	3.79	0.00	0.63	1.59
NES11_M04	0.09	0.03	0.10	3.36	0.00	0.73	1.38
NES11_A05	-0.10	0.03	-0.10	-3.14	0.00	0.64	1.55
NES11_I05	-0.09	0.03	-0.10	-3.22	0.00	0.63	1.59
NES11_E03	0.08	0.03	0.07	2.55	0.01	0.78	1.29
NES11_F05	-0.09	0.03	-0.11	-3.57	0.00	0.72	1.39
NES11_F01	0.08	0.03	0.08	2.68	0.01	0.71	1.41
NES11_B04	0.05	0.03	0.06	2.17	0.03	0.72	1.39
NES11_A01	0.07	0.03	0.08	2.44	0.02	0.63	1.58
NES11_A03	-0.08	0.03	-0.08	-2.48	0.01	0.55	1.83
NES11_B02	0.08	0.03	0.09	2.76	0.01	0.57	1.76
NES11_Q05	-0.06	0.03	-0.07	-2.17	0.03	0.60	1.68

of them and the existence of plenty of good opportunities to create truly high growth firms.

The variables that negatively influence the expert's perceptions about the existence of plenty of good opportunities for the creation of new Firms are, according with the data in Table III are NES11_C01 NES11_N02, NES11_A05, NES11_I05, NES11_F05, NES11_A03 and NES11_Q05, which are related with government assistance, legislation, funding availability, culture, banking services and government subsidies and programs.

In order to analyse the residues, linear regression assumes that errors display a normal distribution with zero mean and constant variance and that they are independent. Our analysis included normal probability plot; a scatterplot; leverage graphic and, in order to validate the assumption of normality, One-Sample Kolmogorov Test shows that there is statistical evidence not to reject the hypothesis that the residual variable follows a normal distribution, for a significance level of 5%. Durbin-Watson, presented in Table II, test displays 1,924, (approximate to 2), and thus it is expectable that the residuals are not correlated.

When the independent variables are highly correlated to each other (multicollinearity) the analysis of the adjusted regression model can be confusing. The values of tolerance and VIF for each independent variable show that there is statistical evidence to support the absence of multicollinearity. These results validate the coefficients obtained in the regression analysis and presented above.

VII. CONCLUSION

In this essay the Global Entrepreneurship Monitor (GEM) database from the 2011 year was analysed. The goal was to identify factors for entrepreneurship and to study their influence in the expert's perceptions about the existence of plenty of good opportunities for the creation of new firms, in their countries.

Three factors are identified from a set of 13 variables: Financial Support, Governematal Politics and Bureaucracy and taxes. Factor analyses was used to identify these three factors that were considered has favour or constraint factors for the development of activity and/or entrepreneurial initiative. Factor 1 consists of variables related to the availability of financial resources, equity and funds for new and growing businesses, including grants and subsidies representing and includes the variables X1 NES11_A01, X2 NES11_A02, X3 NES11_A03, X4 NES11_A04, X5 NES11_A05 and X6 NES11_A06. Factor 2, called "Government Policies" is composed of variables that relates the degree to which government policies relating to taxes, regulations and their enforcement, are neutral with regard to company size and degree to which these policies encourage or discourage new and growing companies, and contains variables X7 NES11_B01, X11 NES11_C02, X12 NES11_C01, X13 NES11_C04. Factor 3, contains the variables X9 NES11_B05, X8 NES11_B04 and X10 NES11_B06, corresponding to "Bureaucracy and taxes" issues.

Using the Multivariate Linear regressions we concluded that these factors are not enough to explain the expert's perceptions about the existence of plenty of good opportunities for the creation of new firms, in their countries.

Then it was mandatory to consider all NES variables included in the Entrepreneurial Framework Conditions (EFCs) (from NES_A1 to NES_I05) and the other variables (from NES_K01 to NES_R06) as independent variables and to use the stepwise method to identify the variables that affect the opinion of the experts of each country concerning with opportunities in their countries for the to create new firms.

The dimensions significant to explain the dependent variable NES11_K01 are 20, having different level of importance in the model. The analysis of standardised regression coefficients shows that the lack of people able to take advantage of plenty of good opportunities for the creation of new Firms and their existence to create truly high growth firms are those that show a higher relative contribution to explain the dependent variable.

Variables related with government assistance, legislation, funding availability, culture, banking services and government subsidies and programs influence negatively the expert's perceptions about the existence of plenty of good opportunities for the creation of new Firms.

REFERENCES

[1] G. Carey, *Multivariate analysis of variance (MANOVA): I.* Theory. Retrieved March, 6, pp. 2007, 1998.

[2] A. Correia, E. Costa e Silva, I. C. Lopes and A. Braga, *MANOVA for distinguishing experts' perceptions about entrepreneurship using NES data from GEM*, In International Conference of Computational Methods in Science and Engineering 2016 (ICCMSE 2016), Vol. 1790, No. 1, pp. 140002, AIP Publishing, 2016.

[3] A. Correia, E. Costa e Silva, I. C. Lopes, A. Braga and V. Braga, *Experts' perceptions on the Entrepreneurial Framework Conditions.* AIP Conference Proceedings (to appear in 2017).

[4] D. C. Howell, *Statistical methods for psychology*, Cengage Learning, 2012.

[5] D. J. Kelley, S. Singer and M. Herrington, *Global entrepreneurship monitor 2011 global report*, Global Entrepreneurship Research Association, London Business School, 2012.

[6] J. Marôco, *Análise estatística com o SPSS Statistics*. ReportNumber, Lda, 2011.

[7] D. J. Kelley, S. Singer and M. Herrington, *Global entrepreneurship monitor 2015/16 global report*, Global Entrepreneurship Research Association, London Business School, 2016.

[8] M. H. Pestana and J. N. Gageiro, *Análise de Dados para Ciências Sociais. A complementaridade do SPSS*, 5ª edição revista e corrigida. Lisboa, Edições Sílabo, 2008.

[9] A. G. Yong, S. Pearce, *A beginner's guide to factor analysis: Focusing on exploratory factor analysis*, Tutorials in Quantitative Methods for Psychology, 9(2), pp. 79--94, 2013.

Aldina Correia has a degree in Mathematics and Statistcs and a PhD in Applied Mathematics. She is a professor in School of Technology and Management (ESTG) of Polytechnic of Porto (P.Porto), since 2004. Coordinator of the Natural and Exact Sciences Department between 2013 and 2016. Coordinator of the master in Methods for Business Decision Making, since 2015. Member of the Scientific Council of ESTG, since 2016, and Member of the Pedagogical Council of ESTG, since 2015. Its research areas are direct search optimization, global optimization, multivariate data analisys and industrial mathematics applications.

Vasco Bento has a degree in Food Science and Technology. He is a Master's Degree in Business Management and Internationalization student in ESTG – P.Porto.

Eliana Costa e Silva has a degree in Mathematics, master in mathematical and application to mechanics, specialization in Statistical and a PhD in Engineering. She is a professor at P.Porto since 2009. Her research areas are optimization and statistical modeling and industrial mathematics.

Vítor Braga has a degree in Economy and a PhD in Business Economics. He is a professor in ESTG–P.Porto (P.Porto), since 2000. Coordinator of the Business Sciences Department and of the Master's Degree in Business Management and Internationalization. Member of the Scientific Council of ESTG and of the Pedagogical Council of ESTG. Its research areas are Cooperation, Internationalization, SME's.