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**CULTURE AS A DETERMINANT OF ENTREPRENEURIAL
ACTIVITY**

Master's thesis

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Name and signature of supervisor.....

Allowed for defence on.....

I have written this master's thesis independently. All viewpoints of other authors, literary sources and data from elsewhere used for writing this paper have been referenced.

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Abstract

In this paper, the author aims to prove the connection between culture and the entrepreneurial activity. In order to do this, the author analyses relations between the chosen Hofstede's cultural dimensions and the rates of several groups that connected to the entrepreneurial process. To estimate the sign and significance of the relation, the author uses GEM dataset for the entrepreneurial panel data, regressing between and random effects models with stepwise addition of the potential socioeconomic factors of influence. The empirical analysis results show a significant negative relation between long-term orientation and the rate of potential entrepreneurs, as well as the significant positive relation between individualism and a rate of entrepreneurial employees. The results obtained from this paper can be used in policymaking for macroeconomic forecasts, as well as in future studies on this topic.¹ (JEL A12, L26, M13, Z13)

Keywords: entrepreneurship, culture, cultural dimensions, entrepreneurial activity.

¹- I would like to extend my personal gratitude to the cultural science professor of my bachelor curriculum, whose brilliant teaching served as one of the main reasons for my interest in the topic.

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Introduction

As the cornerstone for modern economics, entrepreneurship deserves a significant interest from research point of view – as a process, a set of agents on a market and an assembly of socioeconomic and institutional features that drives the economic development. Entrepreneurship presents an extensive topic for research, much more so because of a wide list of practical implications for it, ranging from scientific, where results of empirical analyses are used as a reference point for further studies to practical, where they accommodate the needs of policymakers in areas such as taxation, immigration, education and others (Acs, Szerb, 2007).

Earlier studies have focused much on the economic aspect of entrepreneurship, that is, its effect on the macroeconomic indicators and possible implications for policymakers. Since the early 90s, the interest in the topic piqued, shifting the empirical focus to the questions of origins of entrepreneurship. The latter turned out to be diverse and dependent on numerous factors, from personal characteristics of entrepreneurs and their background to the country and regional economic development and even desire to avoid unemployment (Vivarelli, 2013). A number of researchers have grouped together some of these features as “cultural”, or attributes defined by common group, such as personal values and upbringing, that help entrepreneurs perform successfully on the market and, in turn, create their own culture (Hisrich, 1990; Holcombe, 2003).

Entrepreneurship, especially in cultural context, remains a rather new topic for research. While the overall connection between entrepreneurship and culture looks established, a reasonable number of questions are still unanswered and topics of these questions remain underrepresented, despite the potential applications for the answers. Two reasons exist for this: a potential researcher must both face a wide range of possible research questions on the intersection of entrepreneurship and culture and possess the required knowledge in both of them. The number of studies on the topic has certainly increased substantially from less than 25 some fifteen years ago (Hayton, George, Zahra, 2002), but specific points and connections remain unaddressed. One of such questions that forms a research gap is the direct influence of culture separately on potential and active entrepreneurs in their activity when different economic and social factors have been accounted for.

In this paper the author addresses this research gap, approaching culture from the position of Hofstede’s cultural dimensions (one of the most commonly used in such analysis) by analysing the relationship between culture and the shares of potential and

active entrepreneurs separately. The empirical analysis of the paper also separates effect of culture from different economic, social and religious factors. The aim of the paper is to evaluate the sign and significance of the effect of selected Hofstede's dimensions on the share of active and potential entrepreneurs. The unique aspect of this paper is the addition of a new category of the entrepreneurial employees, as well as the broader selection of countries for the analysis. Because the studies usually focus on the smaller number of countries and one dimension, the research question is therefore: does the individualism effect translate to the broader analysis, what are the effects of other selected dimensions on this scale and whether this effect applies to the new selected group of entrepreneurial employees.

The paper is structured in a way that allows us to disentangle the research question. Literature review summarises the most important previous findings on the topic, while also providing a general overview of the topic and highlighting methods and data used in the similar type of research. Data and methodology chapter describes the data and provides a framework for the empirical analysis of the dataset. Empirical analysis employs correlation and regression analysis to directly tackle the research question. Discussions, limitations and conclusions chapter relates the findings of the empirical analysis to those mentioned in the literature review as well as discusses the limitations of the data and the methods used, while also giving the general conclusion about the possible use for the obtained results.

The results of our study find a consistently significant relation of the rate of potential entrepreneurs with one Hofstede's cultural dimension and the rate of entrepreneurial employees with another of the Hofstede's cultural dimensions.

Besides providing future empirical studies on entrepreneurship with additional factors to account for, the possible implication for this paper is quantifying and determining the significance of the relationship of entrepreneurship and culture, useful for policymakers both in positive economics and in macroeconomic forecasts.

Literature Review

Adding culture to economic studies: Hofstede's approach

Keeping track of the contemporary economic studies that involve culture has become increasingly difficult now, yet this was not always the case. Certain aspects of culture, such as religion, indeed have been regarded as a powerful determinant for economic decisions as early as XVI century and later formalised in Weber's works (Gorodnichenko, Roland, 2010). However, detailed analysis of culture and its possible implications for different economic areas did not begin until the 1980s, which coincides with the time when the cultural features were quantified and generalised into cultural dimensions by Geert Hofstede (Hofstede, 1980). Several other notable mentions of approaches to culture include Schwartz's theory of values (1992) and Inglehart-Welzel cultural dimensions (2010), but none of these are used as frequently as the Hofstede's.

Hofstede based his work on a principle of conditional and deductive approach to measure and separate four initial sets or dimensions of culture: power distance, masculinity versus femininity, uncertainty avoidance and individualism versus collectivism. Culture, in his words, is a collective set of features, or a "programming of mind" (Hofstede, 1980:21) that distinguishes a group from another – a difficult entity to unambiguously quantify. An individual is born into culture and starts acquiring and reinforcing specific cultural traits all the time he is residing within it.

Perceptions of culture might differ when viewed externally and internally, combine and be in turn affected by the cultural traits. Therefore, conditional approach means that the initial dimensions are neither rigid nor exhaustive, and a different perspective might provide a different result or add new dimensions. Hofstede himself claimed that dimensions are just one way of "unpacking" culture, not set categories, but constructs that don't exist but are defined by the researcher (Hofstede, 1980:14). Deductive approach means that with increased precision and more data added some dimensions and their understanding may change over time (Jones, 2007). Indeed, several years after Hofstede's initial work the researcher himself in cooperation with Bond (1988) has added long-term orientation to the list, which represents an Eastern approach to cultural dimensions, and later, in the 2000s, sixth and final dimension of indulgence versus restraint was separated and quantified by Minkov (2010).

In the following decades, Hofstede's results have been extensively analysed, replicated, built upon, modified and criticised. Despite some researchers' critique of culture dimensions as being oversimplifying, focusing mostly on the national level and

not accounting for internal heterogeneity, Hofstede's work set up a base for many future studies and has been praised for its simplicity and ease of incorporating into various micro- and macroeconomic analyses and remains the most cited culture-related approach to date. (Jones, 2007).

Cultural and individual determinants of entrepreneurial activity

Before we start reviewing the existing studies on the topic and their respective results, it is reasonable to define the term "entrepreneurial activity". Entrepreneurship is often discussed in the context of a process, usually profit-generating, change driven and involving risk taking decisions, employing innovation and fostering growth (Eurostat, 2012). For the purpose of this study, we shall also note that it is an individual-driven process, with personal features affecting the process success along the external economic and socio-political factors.

Generally, studies that focus on linking national culture and entrepreneurial activity address one of three separate levels of the latter. They are either researching the effect of culture on the national level of entrepreneurship, connecting cultural features with personal characteristics of the entrepreneurs on an individual level, or analyse its impact on the corporate level, resulting in the studies of the corporate culture (Hayton, George, Zahra, 2002). Cultural dimensions are usually the most commonly used choice for all three areas of study for several reasons. Hofstede's dimensions present a very natural transition from national culture to the specific entrepreneurial traits because each of the initial dimensions can be revised to explain specific characteristics of entrepreneurs as a risk-taking, highly-performing inequality-tolerant individuals (McGrath, MacMillan, Scheinberg S., 1992). In addition, the core principles of cultural dimensions mean that they can be used independently from each other for correlation and regression analysis, with the most prominently researched in conjunction with the entrepreneurial activity being the individualism-collectivism dimension, and most other studies adding power distance and uncertainty avoidance.

Studies of the effect of individualism dimension usually show either positive or parabolic dependence of entrepreneurial activity, depending on the definition of the term. Morris et al. (1993), for example, have discussed firm-level performance in the context of profit with the results of their study showing a negative curvilinear dependence on the individualism dimension. Power distance and uncertainty avoidance are usually expected to have a negative impact on the entrepreneurial activity, although

in some studies these coefficients turn out to be positive or not significant at all at significance level of 10% (Mueller, Thomas, 2001; Urbano, Aparicio, Querol, 2016).

Kirkman et al. (2006) present one of the most extensive list of the most cited studies that incorporate Hofstede's dimensions, grouped by level and economic topic in question. Entrepreneurship is present on the list, but still remains one of the least researched topics on the national level. The most prominent study that is based on the entrepreneurship on the list is Thomas and Mueller's (2000), notable for its critique of the existing framework and methodology of previous works on entrepreneurial activity in cultural aspect. The authors of the paper assess if the set of traits necessary for entrepreneurship is universal or ethnocentric. For this reason, they focus mostly on the entrepreneurial culture, combining survey data of nine countries of the fifteen of Hofstede's original research and four initial dimensions (individualism, power distance, masculinity and uncertainty avoidance) to build a multivariate logistic regression. The results of the study point out that there is no statistically significant difference between the innovation process as the cultural distance from the US increases. This implies that the process of innovation in the US and Western Europe might be vastly different from that in South East Asia, but such difference does not impact their degree of success on respective market. A notable for the current research secondary result of the mentioned study confirms that Hofstede's dimensions indeed have an indirect impact on the entrepreneurial success.

Previously discussed results point out that even though national culture has an effect on the entrepreneurial capabilities of agents, it is unlikely to be the primary cause for successful business practices. Instead, it serves as an additional component that modifies the pre-existing economic situation reinforcing or lowering the resulting performance. Fayolle et al. (2010) expands on this in the study to formalise a general role of national, industry and corporate culture for entrepreneurship. Such system is called an entrepreneurial orientation and defined as "processes, practices and decision-making activities' that lead to corporate entrepreneurship" (Fayolle et al., 2010:714). The role of national culture in such systems, the authors conclude, is to act as a moderator, or a filter between the existing corporate culture and the resulting performance of the company. This means that the successful models of entrepreneurship would capitalise on national culture traits, common beliefs and values as an additional leverage in their activities, creating organisation culture in the process.

While Hofstede's dimensions provide a simple set of indicators for a nation-level analysis, they do not explain the reasoning for starting a business that potential

entrepreneurs make. Besides cultural influence on the decision, individuals might experience peer pressure, economic necessity or capitalise on an early entrepreneurial education. Studies that focus solely on such factors impacting the entrepreneurs are also common. Hisrich (1990) has provided a foundation to the individual-level research of the entrepreneurship by separating the personal characteristics of the potential and active entrepreneurs, such as age, sex, education and assessing their effect on the decision of starting the entrepreneurship. McClelland (1987) used these to separate a set of the most notable personal entrepreneurial traits, such as locus of control, innovativeness and moderate risk-taking.

While both personal and cultural features of an entrepreneur are widely discussed, in the last two decades the focus of studies on entrepreneurship has shifted to a joint analysis of these factors as determinants for an entrepreneurial activity. Therefore, a need arises to establish a link between culture at a national level and personal traits of potential entrepreneurs. Hofstede (2004) offers one way of doing this by analysing cultural dimensions in conjunction with personal traits, derived from revised NEO personality test. His results demonstrate that each personality trait is correlated with at least one of the cultural dimensions, and a stepwise regression shows that cultural dimensions explain around a third of variance in personality traits.

A confirmation of this result comes in a form of a research of a correlation between personal characteristics, Hofstede's dimensions and entrepreneurial orientation based on McClelland research (Mueller, Thomas, 2001). The results of the paper confirm two hypotheses. First, the individualism dimension as well as uncertainty avoidance have significant effect on the entrepreneurial orientation: positive for the first dimension and negative for the second. Secondly, individualism dimension is strongly ($p < 0.001$) linked with internal locus of control, which confirms a link between cultural and personal determinants for entrepreneurial activity.

A culture, therefore, has two major ways of impacting entrepreneurial activity: direct, as a means of directly translating into general rules and aforementioned collective programming, and indirect in two ways: either affecting the development of an individual and his personal traits that contribute or hinder their entrepreneurial activity, or through creating an entrepreneurial orientation as a complex system inside the business itself. In this paper's empirical analysis, we will focus on the disentangling direct culture effect in order to separate the influence on a national level. This also means that the cultural impact on the entrepreneurship can not be reversed: while individual traits and corporate culture are subject to change, national culture is largely

stable and predates the earliest entrepreneurial studies. Therefore, the direct effect generally translates as a one-directional, while the indirect effects are subject to the discussion. Even with this note, we are going to refer to the cultural effects as “significantly related” when the stated is the case as to not include too strict underlying assumptions.

Measuring entrepreneurial activity

The discussed papers bring us to the next obstacle in potential empirical research. With several contemporary studies focusing on measuring the cultural effect on the entrepreneurial activity a common problem arises in the form of quantifying the latter for the following analysis. There is currently no universally accepted answer on what indicators can accurately represent the “successful” entrepreneurship, and therefore, which data sources are to be used in the research. For this reason, different indicators are used for the analysis, even when studies employ similar definitions for entrepreneurial activity. This obstacle is further enhanced by the lack of easily comparable cross-country entrepreneurial statistics and a unified approach to gathering such data.

One simple approach is to use the broad economic indicator, like GDP per capita, as a final outcome of the entrepreneurial activity, with obvious shortcomings of such usage. Lobont et al. (2015) have adopted this method for the analysis of European firms and have established a link between several Hofstede’s cultural dimensions in relation to the GDP per capita as one of the results of the entrepreneurial activity in different areas of Europe using a correlation analysis. Their results suggest different degree, or in some cases, different directions of impact for different areas of Europe, however, a limited scope and sample size, as well as a broad nature of the chosen indicator might make the achieved results questionable. In addition, only the established ownerships were used in the analysis without taking into account the potential entrepreneurs entering the market.

Grilo and Thurik (2006) employ a different method by accounting for both potential and actual entrepreneurial activity by using Eurobarometer survey data of EU countries and the US against a broad range of individual and country-level variables. They use dummy variable of preferring to be self-employed as the indicator for potential entrepreneurs and the dummy variable of being self employed as the indicator for active entrepreneurs. In the paper authors account for cultural differences using the country dummies which end up being significant. One proposed

hypothesis about the source of the variance does involve Hofstede's cultural dimensions, but ultimately it is left explained. The study served as a foundation for some future papers (Freytag, Thurik, 2007) that instead use index of economic freedom as a broad indicator for entrepreneurial activity.

Lastly, one possible source for the economic indicators on the topic commonly used in research related to the governmental policies is the international programme data. Some examples of those used for the entrepreneurship-related studies include Global Entrepreneurship Monitor, or GEM for country level-data about the active and potential entrepreneurs and GLOBE study for the more extensive research of the leadership capabilities tied to the successful entrepreneurial activity (Acs, 2007; Gupta, MacMillan, Surie, 2004).

Overall, different papers use diverse indicators for entrepreneurial and cultural side of the empirical research. Hofstede's cultural dimensions end up serving as the most tested choice for the latter, while entrepreneurial activity indicators vary depending on the research goals and are usually derived from national surveys, international project and monitor data or global rankings of economic activities with no prevalence of either source.

Setting up the hypotheses

To proceed with the empirical study, we need to indicate our choice for the entrepreneurial activity indicators. As we previously stated, studies on the topic generally focus on the active entrepreneurs, leaving out the potential entrepreneurs. To separate the effect further, we distinguish entrepreneurs into three non-overlapping groups: active entrepreneurs, represented by the entrepreneurship survival rate on the market in the medium-term, potential entrepreneurs, represented by their immediate intent to enter the market, and active non-entrepreneurs, represented by the share of employees involved in the entrepreneurial activities. As the groups are non-overlapping, we can analyse the relationship with culture for each of them separately.

For the purpose of this research, we include two out of four Hofstede's initial cultural dimensions: individualism and uncertainty avoidance, as well as the newer long versus short-term orientation dimension. The masculinity dimension is not included as there are no studies at the present confirming the significance of its effect. The power distance dimension has a medium level of pairwise correlation with individualism (-0.627 in the latest Hofstede's dataset), which represents that on average countries that score higher on the individualism dimension will also have on average a lower score of

power distance. This could potentially affect the significance, strength and sign of the respective effects on the dependent variables, especially if both dimensions affect the dependent variable in different directions, but with a relatively similar strength. Therefore, it is also excluded from the final analysis.

Our expectations, which we formulate into hypotheses below correspond to various direct and indirect previous findings, discussed in the literature review. We start with the individualism dimension, which as we have discussed above, is the one majority of studies that analyse the link between culture and entrepreneurship use. Most cited studies (Morris et al., 1993; Mueller, Thomas, 2001) state that the countries scoring higher on the individualism dimension on average also have a higher rate of potential and active entrepreneurs. We extend these findings to project a similar relation culture has with the group of employees involved in the entrepreneurial activity, as this is overall a logical assumption.

Hypothesis 1. Individualism is positively significantly related to the entrepreneurial activity for potential and active entrepreneurs, as well as the employees involved in the entrepreneurial activity.

A less discussed “classic” Hofstede’s dimensions was reported to have varying in significance results, but we tend to support the claims of significant negative relation (Mueller, Thomas, 2001), such that an increase in the uncertainty avoidance dimension on average corresponds to the lower entrepreneurial activity. This hypothesis has an additional indirect confirmation in the form of the individual level studies (McGrath, MacMillan, Scheinberg S., 1992). The hypothesis therefore aims to find evidence that support this claim, at the same time once again extending these assumptions for the entrepreneurial activity of employees group.

Hypothesis 2. Uncertainty avoidance is significant and negatively related to the entrepreneurial activity in all groups.

Lastly, we set to confirm that the newer Hofstede’s dimension of long term orientation is not significantly related to the share of potential and active entrepreneurs, as it merely stands for the differences in the Western and Eastern cultural approaches to entrepreneurship. There is no current data on the significance or the sign of the dimension relation to the entrepreneurial activity, but we extend the findings of Thomas and Mueller (2000) on the innovative process and assume that the underlying differences between cultures serve as different approaches, rather than a reasonable predictor of entrepreneurial success. As there is also no data on the entrepreneurial activity of employees, we aim to determine the significance of the effect in this group

with the hypothesis of it being significant negative. This once again is a reasonable assumption when we extend the personal-level data findings.

Hypothesis 3. Long term orientation is significantly negatively related to the entrepreneurial activity of employees, but is not significant otherwise.

Additionally, we try to replicate the curvilinear relationship for the individualism dimension, found by Morris et al. (1993) for all three groups on the broader scale. This will allow us not only replicate the study, but also check if the underlying relationship holds outside of the US for different groups rather than the original study's active entrepreneurs only.

Hypothesis 4. Entrepreneurial activity of the analysed groups has a significant curvilinear relation with the individualism cultural dimension.

In the following chapter, we will discuss data and methodology required to test these hypotheses.

Data and Methodology

Modelling the relationship between culture and the entrepreneurial activity requires combining datasets of both of these areas. For the purpose of the empirical research we will use Hofstede's dimensions as well as Global Entrepreneurship Monitor dataset (later – GEM) over 62 countries, both developed and developing, for the period from 2007 to 2017 (for the entrepreneurial employees group a time period of 2011-2017 is used instead). The choice of countries is based upon the restrictions of the Hofstede's dimensions' dataset. We are using the GEM database as it offers us a comprehensive list of factors linked to the entrepreneurship. Additionally, we add GDP per capita based on the purchasing power parity and GDP growth rate panel data from the World Bank database, as well as the importance of religion variable from the 2009 Gallup Poll. The merged dataset contains 438 observations of unbalanced panel data. We address both the issue of the observation count and their unbalanced nature by modifying the functional form of the model, regressing it several times while including additional factors that can potentially have a significant influence on the dependent variables, while also focusing on the sign and significance of the Hofstede's dimensions' variables (the discussion of the economic significance of the obtained coefficients, however, is also present).

We start by presenting a descriptive statistics of variables used in our model (Appendix A) and briefly discussing their meaning. Variables from GEM database in particular require additional explanation. Governmental support variable represents the degree of governmental economic support for the for the small and medium enterprises (later – SME). Entrepreneurial education variable measures the extent of such curriculum being present in tertiary education. R&D transfer offers a measurement of SME's access to national research and development. Two infrastructure variables stand for commercial (property rights, legal and accounting services) and physical (space, transport and utilities) structure available to the SMEs. Lastly, fear of failure represents a share of potential entrepreneurs who indicate it as a primary reason for not establishing the business (Global Entrepreneurship Monitor, 2007). The importance of religion variable from Gallup Poll database represents a share of respondents who indicated that religion plays a significant role in their lives.

Additionally, we present the correlation matrix for the independent variables used in the regression analysis (see Appendix B). The results of the correlation present us with some correlated at the medium level independent variables, that are worth

discussing particularly GDP per capita. While a useful general macroeconomic indicator, it has a medium level of correlation with religion, R&D transfer and infrastructure, while also being significantly correlated at a medium level to the entrepreneurial intent and the entrepreneurial activity of employees. This issue might potentially lead to the increase in the multicollinearity in the analysed models. However, as the main aim of the paper is to test the significance and sign of the relationship with Hofstede's dimensions, the multicollinearity is not considered a problem and can be ignored.

We will conduct the empirical research to test our hypotheses in several steps. The baseline model for this paper is a modified cross-sectional between effects model using cultural data and average values of the economic and entrepreneurial activity indicators over the years (Model 1). The equation for the model is given as

$$\bar{y} = \sum \gamma_j z_j + \varepsilon,$$

where \bar{y} represents the mean values of a dependent variable over the years and z_j stand for cross-section data for the Hofstede's cultural dimensions' with their respective regression coefficients γ_j .

The main reasoning in using this particular model lies in the nature of data. Since Hofstede's dimensions are presented as cross-section data, the significance and the sign of their relation to the entrepreneurial activity indicators can not be measured with the fixed or random effects model when combined with the entrepreneurial panel data. Ordinary least squares model, on the other hand, will overestimate the significance of the cross-section data and can only be used as a confirmation for the achieved results, rather than the main functional form for the model. The nature of data and the low observation count also make the use of bootstrapping the standard errors unreasonable, potentially leading to significant variance in results.

We modify the baseline model in several steps, by adding various independent factors that represent governmental support of business (represented by governmental support as well as R&D transfer), entrepreneurial education, country infrastructure (both physical and commercial), macroeconomic conditions (GDP per capita by PPP and GDP growth rate) and personal factors (fear of failure and importance of religion) stepwise as separate regressions (Models 2-6). The resulting regressions have a functional form

$$\bar{y} = \sum \beta_i \bar{x}_i + \sum \gamma_j z_j + \varepsilon,$$

with \bar{y} representing the mean values of a dependent variable over the years, \bar{x}_i – the mean values of independent variables over the years with their respective regression

coefficients β_i , and z_j stand for cross-section data for the Hofstede's cultural dimensions' and importance of religion variables with their respective regression coefficients γ_j .

We then add an additional variable of individualism squared to check for the presence of non-linear relationship between the dependent variable and this dimension (Model 7), as a part of checking for the hypothesis 4. Lastly, we run a pooled OLS model with all the previously included variables (labelled simply "OLS"). By itself, this model does not present us with enough evidence to make conclusions about the significance of the connection between the dependent variable and the Hofstede's dimensions. However, it can serve as an additional means of a robustness check for the obtained results.

As a means of additional robustness check and to overcome the restrictions of the between-effects model, we also run a similar set of random effects model and add year dummy variables to each of the regressions.

Empirical Analysis

Estimating the sign and the significance of the culture relation, therefore, requires several separate sets of regressions. As we analyse three dependent variables for entrepreneurial activity, each representing a different subset of entrepreneurs, and measure the dimensions with two separate sets of models, we construct six sets of mentioned models, using different dependent variables. The first variable is entrepreneurial intentions rate, characterising a proportion of the adult population who are not currently part of any established entrepreneurship, but would intend to start one within a three-year timeframe. The regression results for the between (Table 1) and random effects models (Table 2) are presented below.

Table 1. Regression coefficients for the entrepreneurial intent models (between effects and OLS)

<i>Var.</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>OLS</i>
<i>IDV</i>	-0.254***	-0.227***	-0.165***	-0.107**	-0.041	-0.007	-0.142	-0.094***
<i>IDV</i> ²							0.0014	
<i>UAI</i>	0.024	0.031	0.019	0.007	0.063	0.077	0.085	0.043*
<i>LTO</i>	-0.198***	-0.174***	-0.133***	-0.13***	-0.17***	-0.137**	-0.134**	-0.151***
(1)		Yes	Yes	Yes	Yes	Yes	Yes	Yes
(2)			Yes	Yes	Yes	Yes	Yes	Yes
(3)				Yes	Yes	Yes	Yes	Yes
(4)					Yes	Yes	Yes	Yes
(5)						Yes	Yes	Yes
<i>YD</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>R</i> ²	.4451	.4603	.5678	.5895	.6526	.6522	.6463	.5713
<i>N</i>	438	438	438	438	390	382	382	382

IDV – Individualism, UAI – Uncertainty avoidance, LTO – Long-term orientation. Variable groups: (1) – governmental support, (2) – entrepreneurial education, (3) – country infrastructure, (4) – macroeconomic conditions, (5) – personal factors, YD – year dummies. Groups marked with “Yes” are included in the model. R² provided is an adjusted R². Significant at *10% **5% ***1%

Source: Authors calculations

The individualism dimension is insignificant in this set of models when combined with the macroeconomic and personal factors, therefore, the results are not sufficient for conclusive remarks, which includes the nonlinearity hypothesis. Long-term orientation is significant negatively related and on average the increase of a score in this

dimension by one corresponds to the lower on average share of potential entrepreneurs by 0.13% to 0.198%.

Table 2. Regression coefficients for the entrepreneurial intent models (random effects)

<i>Var.</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>
<i>IDV</i>	-0.244***	-0.241***	-0.247***	-0.25***	-0.182***	-0.165***	-0.423**
<i>IDV</i> ²							0.026
<i>UAI</i>	0.015	0.018	0.018	0.011	0.013	.027	0.041
<i>LTO</i>	-.187***	-0.186***	-0.188***	-0.181***	-0.183***	-0.175***	-0.164***
(1)		Yes	Yes	Yes	Yes	Yes	Yes
(2)			Yes	Yes	Yes	Yes	Yes
(3)				Yes	Yes	Yes	Yes
(4)					Yes	Yes	Yes
(5)						Yes	Yes
<i>YD</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>R</i> ²	.456	.463	.4455	.439	.505	.5048	.5273
<i>N</i>	438	438	438	438	390	382	382

IDV – Individualism, *UAI* – Uncertainty avoidance, *LTO* – Long-term orientation. Variable groups: (1) – governmental support, (2) – entrepreneurial education, (3) – country infrastructure, (4) – macroeconomic conditions, (5) – personal factors, *YD* – year dummies. Groups marked with “Yes” are included in the model. Significant at *10% **5% ***1%

Source: Authors calculations

For the second set of models we observe a similar pattern for the long-term orientation being statistically significant dimension through all the models. In this set of models, a one-point increase in the long-term orientation is associated with an average decrease from 0.164% to 0.188% decrease in the entrepreneurial intent. Additionally, individualism dimension is significant in this set of models, but because this effect is not confirmed by the previous models, we don’t label this result as conclusive.

To understand the economic significance of the provided coefficients, we provide an example of two countries that score sufficiently different on the long-term orientation dimension, Canada with a score of 36 and the Netherlands with a score of 67. With the coefficients and their variance from the first two sets of models, a 31-point score difference on average corresponds to the difference in the rate of potential entrepreneurs ranging from 4.03% to 6.138% (higher long-term orientation corresponds to the decrease in the potential entrepreneurs’ rate), *ceteris paribus*. This illustrates the economic significance of the Hofstede’s dimensions, even while the nature of the data presents us with some variance in the magnitude of the effect. More generally in

standardised coefficient terms, a one standard deviation increase in the long-term orientation is associated with an on average 0.251 to 0.382 standard deviation decrease in the rate of potential entrepreneurs.

The third and fourth sets of models use the established business ownership rate, (survival rate) as its dependent variable, defined as a percentage of the adult population who have been owners of an established SME for at least 42 months. The regression coefficients for the models are presented below in the tables (Table 3, Table 4).

Table 3. Regression coefficients for the entrepreneurial survival rate models (between effects and OLS)

<i>Var.</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>OLS</i>
<i>IDV</i>	-0.055**	-0.057**	-0.063**	-0.056*	-0.056	-0.051	-0.363**	-0.032**
<i>IDV</i> ²							0.003**	
<i>UAI</i>	-0.011	-0.016	-0.015	-0.022	-0.042	-0.042	-0.023	-0.027**
<i>LTO</i>	-0.016	-0.014	-0.018	-0.019	-0.017	-0.025	-0.018	-0.023*
(1)		Yes	Yes	Yes	Yes	Yes	Yes	Yes
(2)			Yes	Yes	Yes	Yes	Yes	Yes
(3)				Yes	Yes	Yes	Yes	Yes
(4)					Yes	Yes	Yes	Yes
(5)						Yes	Yes	Yes
<i>YD</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>R</i> ²	.0298	0	0	0	0	.0053	.0955	.134
<i>N</i>	438	438	438	438	390	382	382	382

IDV – Individualism, UAI – Uncertainty avoidance, LTO – Long-term orientation. Variable groups: (1) – governmental support, (2) – entrepreneurial education, (3) – country infrastructure, (4) – macroeconomic conditions, (5) – personal factors, YD – year dummies. Groups marked with “Yes” are included in the model. R² provided is an adjusted R².

Significant at *10% **5% ***1%

Source: Authors calculations

This set of models show that none of the analysed Hofstede’s dimensions are consistently significantly related to the survival rate when regressed with the economic factors. This result is reasonable, considering that an enterprise’s decision of staying or leaving the market is usually governed by the economic factors, more so than the national culture. The further confirmation of this result is a poor predicting power of the models until macroeconomic variables are introduced (negative values of an adjusted R² are reported as zero). However, Model 7 suggests that a non-linear effect of individualism might be present, similar to the Morris et al. (1993) study (also see Appendix C for the predictive margins plot). This alone does not allow us to claim that

non-linearity is present, and the results of the random effects models doesn't allow is to make any conclusive results. (Table 4).

Table 4. Regression coefficients for the entrepreneurial survival rate models (random effects)

<i>Var.</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>
<i>IDV</i>	-0.051**	-0.046**	-0.043*	-0.047**	-0.028	-0.022	-0.137
<i>IDV</i> ²							0.0011
<i>UAI</i>	-0.021	-0.029	-0.029	-0.026	-0.033	-0.031	-0.024
<i>LTO</i>	-0.016	-0.007	-0.005	-0.006	-0.005	0.0003	0.005
(1)		Yes	Yes	Yes	Yes	Yes	Yes
(2)			Yes	Yes	Yes	Yes	Yes
(3)				Yes	Yes	Yes	Yes
(4)					Yes	Yes	Yes
(5)						Yes	Yes
<i>YD</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>R</i> ²	.0852	.0861	.0799	.0815	.0864	.0828	.0896
<i>N</i>	438	438	438	438	390	382	382

IDV – Individualism, *UAI* – Uncertainty avoidance, *LTO* – Long-term orientation. Variable groups: (1) – governmental support, (2) – entrepreneurial education, (3) – country infrastructure, (4) – macroeconomic conditions, (5) – personal factors, *YD* – year dummies. Groups marked with “Yes” are included in the model. Significant at *10% **5% ***1%

Source: Authors calculations

Lastly, the fifth and sixth sets of models set up an entrepreneurial activity of employees as a dependent variable. It represents a share of employees who are actively involved in the entrepreneurial activities, such as launching a product or setting up a subsidiary, without being owners or senior executives of the entrepreneurship. The resulting coefficients for this set of regressions for the between-effects and OLS models (Table 5) and RE models (Table 6) are given in the tables.

Table 5. Regression coefficients for the entrepreneurial activity of employees models (between effects and OLS)

<i>Var.</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>OLS</i>
<i>IDV</i>	0.066***	0.059***	0.055***	0.053***	0.043***	0.026**	0.008	0.015*
<i>IDV</i> ²							0.0001	
<i>UAI</i>	-0.018	-0.015	-0.016	-0.005	0	-0.004	-0.003	-0.002
<i>LTO</i>	0.009	-0.004	-0.007	-0.012	-0.019*	-0.032*	-0.032**	-0.028***
(1)		Yes	Yes	Yes	Yes	Yes	Yes	Yes
(2)			Yes	Yes	Yes	Yes	Yes	Yes
(3)				Yes	Yes	Yes	Yes	Yes

<i>Var.</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>OLS</i>
(4)					Yes	Yes	Yes	Yes
(5)						Yes	Yes	Yes
<i>YD</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>R</i> ²	.4457	.5043	.5093	.5743	.6619	.7202	.7141	.607
<i>N</i>	264	264	264	264	219	214	214	214

IDV – Individualism, UAI – Uncertainty avoidance, LTO – Long-term orientation. Variable groups: (1) – governmental support, (2) – entrepreneurial education, (3) – country infrastructure, (4) – macroeconomic conditions, (5) – personal factors, YD – year dummies. Groups marked with “Yes” are included in the model. R² provided is an adjusted R².

Significant at *10% **5% ***1%

Source: Authors calculations

For this set of models individualism is significantly positively related to the entrepreneurial activity of employees for all models except for the Model 7, which we use to check for the nonlinearity hypothesis. Therefore, while the curvilinear relation can not be confirmed for this set of models, and an increase of an individualism dimension score by one is on average associated with the 0.015% to 0.066% increase in the rate of the entrepreneurial employees. This effect is significant both in the initial model, as well as with the addition of macroeconomic and personal factors.

Table 6. Regression coefficients for the entrepreneurial activity of employees models (random effects)

<i>Var.</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>
<i>IDV</i>	0.07***	0.066***	0.065***	0.062***	0.046***	0.026**	0.002
<i>IDV</i> ²							0.0002
<i>UAI</i>	-0.017	-0.014	-0.014	-0.011	-0.004	-0.007	-0.005
<i>LTO</i>	0.006	0.002	0.0007	-0.002	-0.014	-0.031***	-0.03***
(1)		Yes	Yes	Yes	Yes	Yes	Yes
(2)			Yes	Yes	Yes	Yes	Yes
(3)				Yes	Yes	Yes	Yes
(4)					Yes	Yes	Yes
(5)						Yes	Yes
<i>YD</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<i>R</i> ²	.3113	.3587	.3596	.4029	.5455	.6241	.6266
<i>N</i>	438	438	438	438	390	382	382

IDV – Individualism, UAI – Uncertainty avoidance, LTO – Long-term orientation. Variable groups: (1) – governmental support, (2) – entrepreneurial education, (3) – country infrastructure, (4) – macroeconomic conditions, (5) – personal factors, YD – year dummies. Groups marked with “Yes” are included in the model. Significant at *10% **5% ***1%

Source: Authors calculations

The last set of models confirms the significance of the individualism Hofstede's dimension. A one-point increase in this variable corresponds to on average a 0.026% to 0.07% increase in the rate of the entrepreneurial employees. In both sets of models for this dependent variable, long-term orientation also becomes significant in the final model, but the result is not conclusive enough to report it when all models are analysed.

Discussing the economic significance, an example of two sufficiently different countries by individualism, we take an example of Finland (IDV – 63) and Spain (IDV – 51). In this case, a 12-point difference in the individualism score on average corresponds to the 0.18% to the 0.84% increase in the rate of entrepreneurial employee activity for Finland, *ceteris paribus*. More generally, a one standard deviation increase in the individualism score corresponds to on average a 0.127 to 0.595 standard deviations increase in rate of entrepreneurial employee activity.

With the empirical analysis concluded, we have partially confirmed some of the initially set up hypotheses. We have also discussed the economic significance of the obtained coefficients. The obtained results allow us to further discuss their significance, provide conclusions and relate our findings to the other research conducted in this field.

Discussions, Limitations and Conclusions

Hypotheses and Data Discussion

New data obtained from the empirical analysis does not fully fall in line with our predictions. We will start by addressing the hypotheses stated in the literature review and how they correspond to the results of the empirical analysis.

Hypothesis 1. Individualism is positively significantly related to the entrepreneurial activity for potential and active entrepreneurs, as well as the employees involved in the entrepreneurial activity.

The regression analysis only confirms this relation for the entrepreneurial activity of employees' models. The relation is significant in some of the models for the first two groups, but the effect is negative and significance is not consistent enough for the conclusive remarks.

Hypothesis 2. Uncertainty avoidance is significant and negatively related to the entrepreneurial activity in all groups.

For all of the analysed sets of models, the effect of this dimension turns out to be insignificant.

Hypothesis 3. Long-term orientation is significantly negatively related to the entrepreneurial activity of employees, but is not significant otherwise.

Long-term orientation does show a significant negative relation with the entrepreneurial activity of employees, but it is not consistent through all models. On the contrary, this significant negative relation is consistent with the regressions that use the entrepreneurial intent as the dependent variable. It is reasonable to note here, however, that this result might be biased, as there is a higher number of countries with better preconditions for entrepreneurial activity among the short-term oriented countries in the analysed dataset, and the difference is of economic, rather than cultural nature.

Hypothesis 4. Entrepreneurial activity of the analysed groups has a significant curvilinear relation with the individualism cultural dimension.

The empirical analysis rejects the nonlinearity hypothesis for all groups of models. The non-linear relation is present in the complete between effects model for the survival rate dependent variable, but the results are not confirmed by the other models.

The results of testing are different from the expected, but several of the Hofstede's dimensions are consistently significant during the study for different groups, including the new group of entrepreneurial employees. The non-linearity hypothesis does not fall in line with the earlier Morris et al. (1993) study, which allows for the

reasonable conclusion that the specific form of the individualism relation does not translate outside of the US.

Having outlined the results from the empirical analysis, we can now state several limitations of the analysis in general. We start by highlighting several issues that can arise when combining entrepreneurial indicators with cultural dimensions or any other culture-related data in a research. To start with, different aspects of entrepreneurial activity can potentially be affected by different cultural aspects, on top of economic policies and phases of the business cycle. Secondly, entrepreneurship represents a rapidly changing ecosystem, while cultural features are stable over short periods of time and can be expected to not change much even in the longer perspective (McGrath et al., 1992). Additionally, there is no possibility to control for all the factors that can potentially impact the entrepreneurial activity of any kind, nor it is possible to identify all aspects of the culture that might have a significant impact on it. In this paper, we partially address this problem by outlining several groups of the more common and influential factors that can correspond to significant changes in the dependent variables and by using Hofstede's dataset, which is proven to explain majority of the culture-related phenomena. Lastly, both entrepreneurial activity and cultural dimensions are quantified using polls, surveys and interviews, which can potentially increase errors because of subjectivity as well as various sample and non-sample errors.

Several other issues arise specifically from the selected research aim. In the analysis, we use Hofstede's cultural dimensions as the most cited and widely used source for quantifying the culture. However, this severely limits the number of observations for the empirical analysis, as the Hofstede's dataset only quantify less than 70 countries for the initial four dimensions, and the newer dimensions are even less represented. This also translates into any empirical research, as the number of observations can not exceed 70 for each observed year, even when not taking into the account the unbalanced data and possible gaps in the observations. The latter problem is partially addressed in the paper with the GEM dataset which is one of the more balanced sources for the entrepreneurial data, – but the core issue remains essentially without any plausible solution.

Additional problem of Hofstede's dataset is its contemporary relevance. While we have stated that the culture changes rather slowly compared to the economic variables, like entrepreneurial activity, the main part of the cultural research has been analysed by Hofstede in 1980s, and as such, might be outdated. It would set is its contemporary relevance. While we have stated that the culture changes rather slowly compared to the

economic variables, like entrepreneurial activity, the main part of the cultural research has been analysed by Hofstede in 1980s, and as such, might be outdated. It would be then reasonable to conduct the analysis similar to that of this paper using another set of cultural indicators, but among several mentioned in the paper none is as influential as the one used.

Closing remarks

Within the scope of this paper, we have analysed the relationship of culture with three distinct groups of people in regards to their entrepreneurial activity. Our results overall follow a mixed pattern: while the results of the empirical analysis do not confirm the stated hypotheses based on the earlier studies, the found relationships are consistently significant throughout the empirical analysis.

Relationship between culture and entrepreneurial activity represents a highly demanded, but difficult to analyse area of research. With several limitations on the empirical analysis by the very nature of data, stated in the paper, the current amount of papers on the topic is quite insufficient for the comprehensive analysis. In this paper, we have confirmed that there exists a distinctly different pattern of influence of factors for potential and active entrepreneurs, but also the employees involved in the entrepreneurial process. We have applied the hypothesis of non-linear relationship of individualism onto this new group, with empirical results rejecting this hypothesis.

The results of the paper suggest that some cultural dimensions, among other factors, indeed do have a significant relationship with the entrepreneurial activity. This result can be further built upon both from cultural science perspective by using different culture indicators, and from economics, by re-assessing significance of various economic determinants for entrepreneurial activity in conjunction with the cultural dimensions. Several other questions that lie outside the scope of this paper, such as the exact functional form of the relationship with individualism dimension or the robustness of the significance of the relationship when accounted for the global shifts in economics such as the Great Recession. These can serve as the directions or guidelines for the further research on the topic.

References

- 1) Acs, Z. J., Szerb, L. (2007) Entrepreneurship, economic growth and public policy. *Small Business Economics*, Vol. 28, Issue 2-3, pp. 109-122
- 2) Audretsch, D., Thurik R. (2001) What's New about the New Economy? Sources of Growth in the Managed and Entrepreneurial Economies, *Industrial and Corporate Change*, Vol. 10, Issue 1, pp. 267–315
- 3) Eurostat (2012) Entrepreneurship determinants. Culture and capabilities, EU publications. Retrieved at <http://www.dx.doi.org/10.2785/29545>
- 4) Gorodnichenko, Y., Roland, G. (2010) Culture, Institutions and the Wealth of Nations. NBER Working Paper No. w16368
- 5) Fayolle A., Basso O., Bouchard V. (2010) Three levels of culture and firms' entrepreneurial orientation: A research agenda, *Entrepreneurship and Regional Development*, Vol. 22, Issue 7-8, pp. 707-730
- 6) Freytag, A., Thurik R. (2007) Entrepreneurship and its determinants in a cross-country setting, *Journal of Evolutionary Economics*, Vol. 17, Issue 2, pp 117–131
- 7) Grilo I., Thurik A. (2006) Entrepreneurship in the Old and New Europe. In: Santarelli E. (eds) *Entrepreneurship, Growth, and Innovation. International Studies in Entrepreneurship*, vol 12. Springer, Boston, MA
- 8) Gupta V., MacMillan I., Surie G. (2004) Entrepreneurial leadership: developing and measuring a cross-cultural construct, *Journal of Business Venturing*, Vol. 19, Issue 2, pp. 241-260
- 9) Hayton J., George G., Zahra S. (2002) National Culture and Entrepreneurship: A Review of Behavioral Research, *Entrepreneurship Theory and Practice*. Vol. 26, Issue 4, pp. 33-52.
- 10) Hisrich, R. D. (1990) Entrepreneurship/intrapreneurship. *American Psychologist*, Vol 45(2), pp. 209-222
- 11) Hofstede, G. (1980) *Culture's Consequences: International Differences in Work-Related Values*, *Cross Cultural Research and Methodology* (5th Ed.), SAGE, 1984.
- 12) Hofstede, G., Bond, M. (1988). The Confucius connection: from cultural roots to economic growth. *Organizational Dynamics*, 16, pp. 4-21.
- 13) Hofstede G., McCrae R. (2004) Personality and Culture Revisited: Linking Traits and Dimensions of Culture, *Cross-Cultural Research*, Vol.: 38, Issue: 1, pp. 52-88
- 14) Hofstede, G., Hofstede, G.J., Minkov, M. (2010). *Cultures and Organizations: Software of the Mind* (Rev. 3rd ed.). New York: McGraw-Hill.

- 15) Holcombe, R. (2003) The Origins of Entrepreneurial Opportunities. *The Review of Austrian Economics*, Vol. 16, Issue 1, pp. 25–43
- 16) Inglehart R., Welzel C. (2010) Changing Mass Priorities: The Link Between Modernization and Democracy. *Perspectives on Politics*. Vol 8, Issue 2, pp. 551-567.
- 17) Jones, M. (2007) Hofstede - Culturally questionable? Oxford Business & Economics Conference. Oxford, UK.
- 18) Kirkman, B., Lowe, K., Gibson, C. (2006) A quarter century of culture's consequences: A review of empirical research incorporating Hofstede's cultural values framework. *Journal of International Business Studies*, Vol. 37, Issue 3 pp. 285-320
- 19) Lennon, J. Vannocci, I. (1989) Entrepreneurs - reality and rhetoric *International Journal of Contemporary Hospitality Management*, Vol. 1, Issue 2, pp. 25-27
- 20) Lobont, O., Nicolescu, A., Lapugean (Ignat), C., Alebaite, I. (2015), Is Cultural Diversity a Determinant of the Entrepreneurial Activity? *Transformations in Business & Economics*, Vol. 14, No 2B(35B), pp.332-354
- 21) McDaniel, B. (2000) A survey on entrepreneurship and innovation. *Social Science Journal*, Vol. 37, Issue 2, pp. 277-284
- 22) McClelland D. (1987) Characteristics of Successful Entrepreneurs, *Journal of Business Venturing*, Vol. 19, Issue 2, pp. 241-260
- 23) McGrath R., MacMillan I., Ai-Yuan Yang E., Tsai W. (1992) Does culture endure, or is it malleable? Issues for entrepreneurial economic development, *Journal of Business Venturing*, Vol. 7, Issue 6, pp. 441-458
- 24) McGrath R., MacMillan I. Scheinberg S. (1992) Elitists, risk-takers, and rugged individualists? An exploratory analysis of cultural differences between entrepreneurs and non-entrepreneurs, *Journal of Business Venturing* Vol. 7, Issue 2, pp. 115-135
- 25) Morris M., Avila R., Allen J. (1993) Individualism and the Modern Corporation: Implications for Innovation and Entrepreneurship. *Journal of Management*, Vol. 19, Issue 3, pp. 595 – 612
- 26) Mueller, S., Thomas, A (2001) Culture and entrepreneurial potential: A nine country study of locus of control and innovativeness, *Journal of Business Venturing* Vol. 16, Issue 1, , pp. 51-75
- 27) Sagie, A., Elizur, D. (2001) Entrepreneurship and culture as correlates of achievement motive: a multifaceted approach *International Journal of Entrepreneurship and Innovation Management*, Vol. 1, Issue 1, pp. 34-52

- 28) Schwartz, S. (1992) Universals in the content and structure of values: Theory and empirical tests in 20 countries. *Advances in experimental social psychology*. Vol. 25, pp. 1-65.
- 29) Spilling, O. (1991) Entrepreneurship in a cultural perspective. *Entrepreneurship and Regional Development*, Vol. 3, Issue 1, pp. 33-48
- 30) Thomas, A., Mueller, S. (2000) A case for comparative entrepreneurship: Assessing the relevance of culture. *Journal of International Business Studies*, Vol. 31, Issue 2, pp. 287-301
- 31) Urbano, D., Aparicio, S., Querol, V. (2016) Social progress orientation and innovative entrepreneurship: an international analysis, *Journal of Evolutionary Economics*, Vol. 26, Issue 5, pp 1033–1066
- 32) Vivarelli, M (2013) Is entrepreneurship necessarily good? Microeconomic evidence from developed and developing countries, *Industrial and Corporate Change*, Vol. 22, Issue 6, pp. 1453-1495
- 33) Wennekers S., Thurik R. (1999) Linking Entrepreneurship and Economic Growth. *Small Business Economics*, Vol. 13, Issue 1, pp 27–56

Appendix A

Descriptive Statistics

Table 1A. Descriptive statistics of the variables used in the regression analysis

<i>Variable</i>	<i>Min</i>	<i>Max</i>	<i>Mean</i>	<i>Std. dev.</i>
<i>Entrepreneurship survival rate^(a)</i>	2.12	60.49	17.305	11.764
<i>Entrepreneurial intents^(a)</i>	0.42	33.06	7.649	4.312
<i>Entrepreneurial activity of employees^(a)</i>	0.1	16.18	3.661	2.727
<i>Individualism^(b)</i>	12	91	47.356	23.171
<i>Uncertainty avoidance^(b)</i>	8	112	68.251	22.462
<i>Long-term orientation^(b)</i>	13	100	48.845	22.677
<i>Governmental support^(a)</i>	1.59	3.96	2.574	0.47
<i>R&D transfer^(a)</i>	1.57	3.73	2.45	0.372
<i>Post school entrepreneurial education^(a)</i>	1.83	3.86	2.835	0.335
<i>Commercial and professional infrastructure^(a)</i>	1.26	3.99	3.039	0.372
<i>Physical and service infrastructure^(a)</i>	2.1	4.82	3.819	0.439
<i>GDP per capita by PPP^(c)</i>	2570.85	94920.96	29202.12	16273.36
<i>GDP growth rate^(c)</i>	-14.4	25.56	2.332	3.626
<i>Fear of failure^(a)</i>	11.59	72.01	36.287	8.204
<i>Importance of religion^(d)</i>	0.16	0.99	0.571	0.239

(a) – GEM database, (b) – Hofstede’s dimensions, (c) – World Bank dataset, (d) – Gallup Poll religion survey

Source: Authors calculations

Appendix B

Correlation matrix

Table 1B. Pairwise correlation of the variables of the regression analysis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1)	1							
(2)	0.2346*	1						
(3)	-0.2499*	-0.1879*	1					
(4)	-0.1516*	-0.0984*	0.1549*	1				
(5)	-0.3695*	-0.1254*	0.4078*	0.5994*	1			
(6)	0.0972*	-0.0489	0.1029	0.3420*	0.5305*	1		
(7)	-0.3967*	-0.1736*	0.4697*	0.2735*	0.5900*	0.4295*	1	
(8)	-0.2076*	-0.0041	0.4066*	0.3506*	0.4836*	0.2106*	0.4145*	1
(9)	0.2775*	0.0132	-0.0829	0.1411*	0.0211	0.0943	-0.0661	0.0068
(10)	-0.5499*	-0.2289*	0.6589*	0.3579*	0.5920*	0.0994*	0.5168*	0.4590*
(11)	-0.2182*	0.1502*	0.012	0.0342	0.0657	-0.1287*	0.0614	-0.0055
(12)	0.5167*	0.2418*	-0.6350*	-0.1650*	-0.3910*	-0.0064	-0.3888*	-0.4714*
(13)	-0.5579*	-0.2538*	0.5543*	0.1314*	0.2963*	-0.0396	0.4656*	0.1820*
(14)	0.1881*	-0.0125	-0.1960*	-0.3347*	-0.2600*	-0.0736	-0.2714*	-0.2974*
(15)	-0.4040*	-0.0999*	0.1275*	0.2318*	0.2990*	0.0154	0.1409*	0.2494*

	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(9)	1						
(10)	-0.1477*	1					
(11)	-0.0642	0.0464	1				
(12)	0.1729*	-0.5638*	-0.0541	1			
(13)	-0.2311*	0.5582*	0.1026*	-0.5278*	1		
(14)	-0.1748*	-0.3292*	0.0331	0.1367*	-0.3121*	1	
(15)	-0.0246	0.2244*	0.2781*	-0.4853*	0.0834	-0.0456	1

Significant at *5%

(1) – Entrepreneurial intent, (2) – Entrepreneurial survival rate, (3) – Entrepreneurial activity of employees, (4) – Governmental support, (5) – R&D transfer, (6) – Post school entrepreneurial education, (7) – Commercial and professional infrastructure, (8) – Physical and service infrastructure, (9) – GDP growth rate, (10) – GDP per capita by PPP, (11) – Fear of failure, (12) – Importance of religion, (13) – Individualism, (14) – Uncertainty avoidance, (15) – Long-term orientation

Source: Authors calculations

Appendix C

Predictive margins

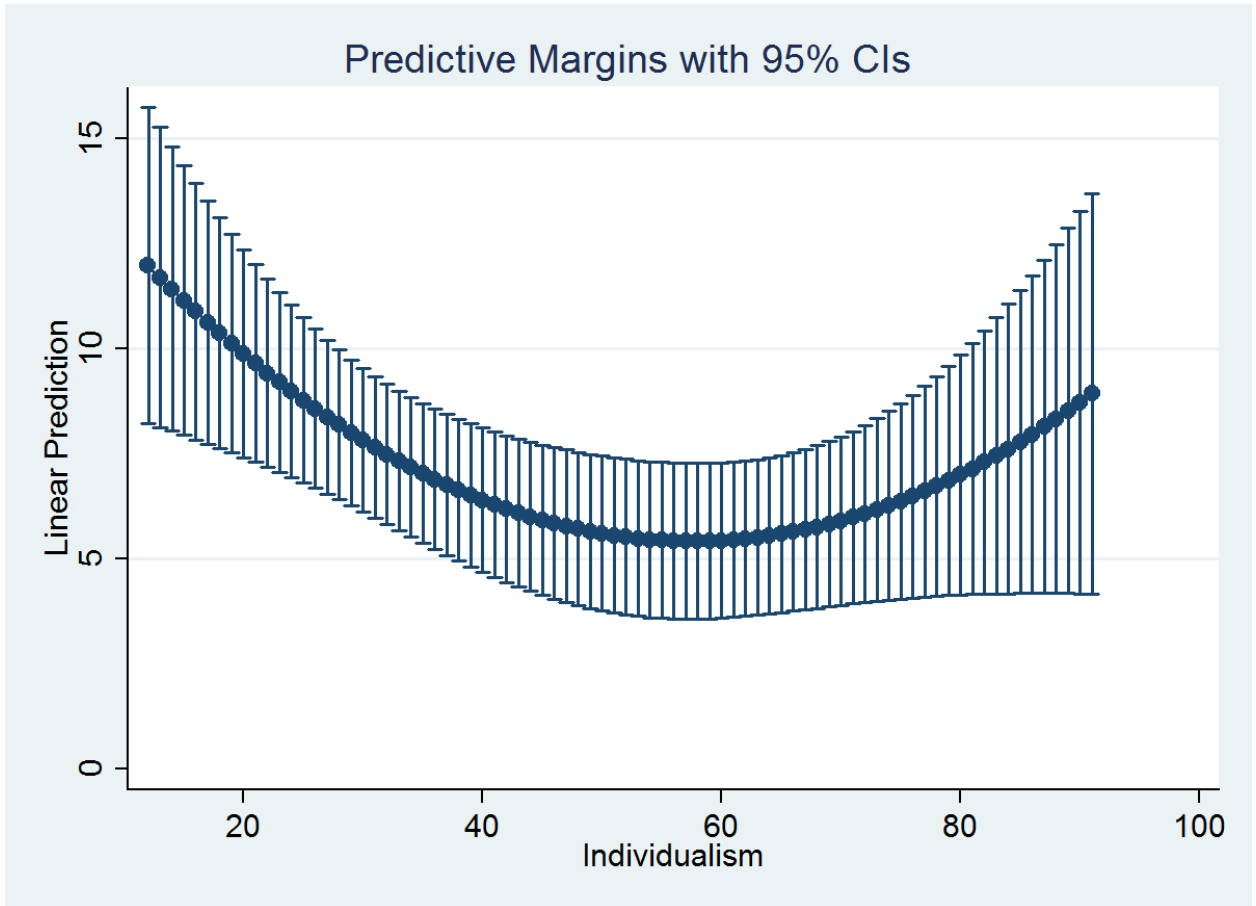


Figure 1C. Predictive margins for individualism dimension

Source: Authors calculations

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