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Regional innovation culture: exploration in Croatia

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Abstract

The aim of the article is to explore the possible impacts of culture on in-country regional differences in innovation capacities and propensity to entrepreneurship using the Hofstede's model of national culture. There is a number of studies that proved the profound influence of culture on innovation and entrepreneurship capacities. By contrast to cross-country cultural studies, the cross-regional cultural research on innovation and entrepreneurship within a country, especially in Europe, is an under-researched area. The research is based on national survey data (N= 1000) in Croatia, the country that suffers from weaknesses in innovation and entrepreneurial capacities with great regional development disparities. This suggests it as a good example for exploring regional cultural differences.

The research proved that Croatian regions are culturally heterogonous but the correlation between regional culture and regional entrepreneurship and innovation capacities was not found. Hofstede's model appeared as having little practical value for strategic management and development and suggest that other factors, presumably more structural than cultural, that mediate poor innovation and entrepreneurship performance should be taken into account. The article contributed to the conceptualization and empirical research of regional innovation culture and provide evidence of the limited explanatory power of Hofstede's model in explaining regional differences by cultural factors.

***Key words**: innovation culture, Hofstede's model, Croatia, innovation laggards, regional development, entrepreneurship*

1. Introduction

The innovation paradigm since 1980s has undergone a radical change to become a contextual, path-dependent and locally specific phenomenon [69] that has reversed the causality between technological and social factors in creating innovation. This gave rise to exploration of non-technological socio-cultural determinants of growth, such as the concept of "social capability" [32] and social capital [53] [1]. Weckroth and Kemppainen [105] pointed out needs for more deeply research on *"causality and connection between cultural values and*

economic performance and growth". However, the literature on innovation culture at the national/country level is quite scarce [52]. The cross-regional cultural research conducted within national boundaries and of multinational alliances like the European Union have been critically debated [77] [66] but empirical research on the cultural significance of regional boundaries remains scanty [77].

The purpose of this paper is to explore the possible impacts of culture on innovation and entrepreneurship exploring the applicability of the Hofstede's model of cultural dimensions on in-country regional differences in innovation and entrepreneurship in Croatia. Although a member of the EU 28 since 2013, Croatia is typical innovation laggard [54] with the legacy of the socialist planned economy and large regional differences in economic and social development [27], which makes it an interesting case for studying a cross-regional differences.

Additional motif is related to rather slow and discouraging pace of economic growth of Croatia during the last 25 year after the collapse of socialistic regime in 1991 and almost eight-year long economic recession (2008-2015), which is a case without precedent among the European member states. This definitely challenges the research that go beyond pure economic and technological factors and to entry the territory of invisible and hidden but systemic social factors which permeated the whole society such as national cultural characteristics.

The study contributes to the conceptualisation of regional innovation culture and to the rather small body of empirical literature in this domain, especially about the transition countries, which are not covered by Hofstede's original research [51] [64]. It also contributes to the Hofstede's theory of culture and provides empirical evidence for critical arguments of the Hofstede's model. It challenges the validity of the Hofstede's cultural model for studying regional innovation culture and support earlier critiques which find this model conceptually simplified and methodologically over-empirical in relation to its explorative and predictive values [97] [25] [99] [64] [52].

The remainder of the article is structured as follows. The second section aims to clarify the theoretical framework and the concept of regional innovation culture, while the third chapter gives the arguments for using the Hofstede's model. The fourth section introduces the empirical model and aims of research. The methodology and data collection are described in the fourth sectionn while the fifth section comments on the empirical findings. The sixth and final section concludes and outlines some implications for future cultural research on innovation propensity in the post-socialist countries, inspired by the results of this study.

2. Toward a concept of regional innovation culture

Having no tradition in mainstream social or business management literature, culture lacks a sound theoretical foundation and that represents a substantive obstacle to widespread empirical exploration [15]. Innovation culture lacks a clear conceptualisation, which can be considered because of two processes. First, regional innovation culture is usually replaced by the concept of organisational or corporate culture since regional innovation pattern is perceived as highly dependent on the companies' innovation profile and social values [80][102] [88].

Second, innovation culture is usually considered as a derivative of the generic notion of national culture, conceptualised in a limited number of "big theories", primarily those of Hofstede [39], Schwartz [86], the GLOBE project [44], Hampden-Turner and Trompenaars [36] and Inglehart [45]. They perceive some dimensions of national culture as supportive to innovation and these dimensions are implicitly considered as constituents of an innovation (sub) culture. Despite the lack of a clear consensus over which cultural values promote national innovation rates, and the difficulties in empirical operationalisation and interpretation [97] [81] [29], the literature generally recognises a number of social values as characteristic of innovation culture. The social values and norms that promote risk-taking, creativity, collaboration and

openness are usually seen as critical for innovation success [55] [24] [80]. Collectivism and conformity, to use Hofstede's dimensions of national culture, are anathema to innovation [97].

Research which focuses on national/country innovation propensity usually involves a cross-cultural study of a large number of countries and is driven by the common view that differences and similarities in basic values derive from each country's unique trajectory of social development, historical heritage, and cultural experiences and traditions [7] [92] while the process of globalisation has not exerted a significant influence [46] [29]. This approach is largely prompted by Hofstede's influential work. He considers the relevance of cultural dimensions mostly at national level [60] and continues to prove his thesis in subsequent empirical research [66]. The availability of analytical data on the national, not on the sub-national or regional level, naturally directs researchers to analyse the cultural phenomena at the national level.

However, there is a growing recognition that innovative activities are not uniformly distributed in space but have a tendency of spatial clustering [106] suggesting that certain cultural identity linked to "innovative culture" does not always overlap with national identity [10] [59] [58] [77] [96]. There is evidence that knowledge and innovation represent inherently regional assets [5] [17] [19] [102]. Boschma [14] identified five aspects of proximity (the geographical, cognitive, social, institutional and organisational proximity), providing companies with common advantages which are, according to Cooke [23], difficult to tap from a distance. Various studies confirm that countries are rarely homogenous and coherent in terms of culture as culture stands for the prevailing values, beliefs and behaviours [51]. It makes generalising about a country or national culture difficult and implies the existence of subcultures within a national boundary. The approaches to studying national subcultures differ. In the United States, for example, research is more focused on micro-culture from an ethnic perspective while cultural research on a regional level is quite rare [60]. In Europe, by contrast, within-country cross-cultural research is mainly carried out at the regional level driven by the

dominant institutional-bureaucratic view of the new European regionalism [73] [65]. The growing interest in cross-regional innovation culture in Europe is driven by the institutional and spatial restructuring of the European states within the process of de-statisation and denationalisation of the political systems; in these processes, "region" emerged as a key site of economic coordination, spatial governance and political authority [3]. Concepts such as "Europe of the regions" [10] [16], new regionalism [6] and European regional identity [65] [74] [75] [3] dominates in these processes.

Studying cultural dimensions on the regional level is a challenge since the region is not uniformly defined neither in terms of cultural identity [73] [74] [3] nor as a unit of empirical analysis [51] [77]. The current debates refer to both sub- and supra-state units within European Union, while for this research region refers to in-country territories that can be determined in various ways. The most common in-country regionalisation is the administrative one devised by the European Union. It divides the territory of European states into 1315 statistical units at the NUTS level I, II and III [31]. The drawback of this approach is that the established administrative units have little in common with the historical heritage and cultural identity of the regions. Additionally, in-country regionalisation relies on ethnicity. The emphasis on the importance of "ethnic group" for determination of regional and national cultural identity mostly coincides with the population within national borders but may also involve population from other countries such as the Basques, the Walloons or the Irish [51]. Ethnicity usually includes a strong psychological or emotional component that shapes group identity and goes deep into the past. Such groups in Europe usually represent national minorities.

However, the concept of region in Europe is influenced more by constructivist approaches that implies how regions might be socially constructed "from above" through the institutionalisation of regions process [73] [65]. The definition of regional culture in this research is determined by the context of institutionalisation of the regional identity mostly applied within European Union [73]. It assumes geographical and socio-economic proximity

and similar historical heritage of a group of people who, therefore, share similar mind-sets, values and behaviour. It is supposed that similar mind-set, values and behaviour build the distinctive regional innovation culture, which is tested in this research using the Hofstede's cultural dimensions.

Following this institutionalisation perspective, "region" in this research is understood as a territorial construct which combines administrative units of 21 counties with the physiognomic, historical, and cultural identity of the regions. From the historical and cultural perspective, the territory of Croatia is usually divided in five macro regions for reasons of political control, i.e., Slavonia and Baranya, Dalmatia, Central Croatia, Littoral and Lika and the City of Zagreb [48]. These regions roughly correspond to the contemporary proposals of a highly debatable reform of the local and regional self-government to establish five regions instead of 21 counties, which would follow the borders of counties as well as the principle of historical similarities and functional efficiency. They include Central Croatia, Littoral (Primorje) and Istria, Dalmatia, Slavonia and Zagreb region. This study follows the aforementioned division of the proposed "new regionalism" adjusted for analytical reasons, to the division of the regions devised by the previous explorations of entrepreneurship in Croatia [91]. Definition of regions in the previous research also follows historical and geographical distinctions, which made them close to the proposed "new regions" but yet not identical.

3. Why Hofstede's model

Although Hofstede's theory of national culture has received heavy criticism as being too simplistic, meaningfulness, reductionist, theoretically, methodologically flawed, and out-dated [25] [97] many others found evidence that 'Hofstede's dimensions have a strong convergent validity compared to other on-going cultural frameworks [61] and are predictive and replicable tool for economic outcomes' [106]. That made scholars to conclude that the Hofstede' model is still highly valid for exploring national innovation culture [29] and is a

leading concept in studding the relationship of national culture and national rate of innovations. Besides this, the simplicity of the model and availability of methodology has made us to apply it on studding the innovation capacity of Croatia

Despite criticism [9], the Hofstede's model remains one of the most cited scholars in the social sciences and still dominates cross-cultural management research and consultancy [22]. Kirkman et al. [52] concluded that there is an impressive literature discussing, approving and criticizing Hofstede's concept of national culture. Many scholars found evidence that "Hofstede's [38] *dimensions are replicable and predictive of economic outcomes"* [106] and have a strong convergent validity compared to more contemporary cultural frameworks such as those of Schwartz, GLOBE or Hampden-Turner and Trompenaars [61].

When comes to innovation culture, Hofstede's model is also highly used for studying various aspects of innovation capacity and performance at the country level. An overview is given in the Table 1.

Please insert Table 1 about here

By contrast to cross-country cultural studies, the cross-regional cultural research on values, innovation and entrepreneurship within a country, especially in Europe, is an under-researched area, with few analyses [49] [50] [11] [43] [20]. The lack of such cultural research on regional level as well as Croatian regional disparities and conflicting reasons for its economic lagging provide main incentives for studding in-country cross-regional cultural differences in Croatia.

4. Concept and aims of research

The purpose of research was to apply the Hofstede's model of cultural dimensions on in-country regional differences with the aim to explore whether cultural differences have any

implications for regional innovation capacities, entrepreneurship propensity and overall development.

The research is based on the extensively used Hofstede's value survey which states that six cultural dimensions (Individualism, Power Distance, Masculinity, Uncertainty Avoidance, Long-Term Orientation and Indulgence) can capture the most important cultural features that distinguish national, regional or even smaller samples of respondents [39].

The study is motivated by large regional disparities in Croatia, and by the presumption that some regional cultural characteristics can be predictors of low innovativeness, entrepreneurship propensity and related slow economic growth.

For the purpose of this research the territory of Croatia, which is administratively divided in 21 counties, was split up in six regions following the regional division from previous research focused on monitoring of entrepreneurship. The regionalisation is based on geographical-historical proximity of the counties and includes the following regions: /1/ North Croatia, /2/ Zagreb and surroundings (in short: Zagreb), /3/ Dalmatia, /4/ Slavonia and Baranya (in short: Slavonia), /5/ Istria, Littoral Croatia and Gorski Kotar (in short: Istria) and /6/ Lika and Banovina (in short: Lika) (see Appendix 1).

Croatia is characterised by considerable and long-term regional disparities, in particular by significant differences between the eastern and western part of the country [26]. In terms of the differences among the regions selected for this study are also substantial. According to the latest available data for GDP per capita and Development index at the regional level [72], the most developed are the Zagreb region (mainly due to Zagreb being the capital) and the Istrian region, while Dalmatia and Lika follow. The least developed are the regions of Slavonia (Pannonian basin) and North Croatia. The Zagreb region, for example, has twice the GDP per capita of Slavonia and a five times higher Development index (Figure 1a and Figure 1b).

Insert Figure 1a and Figure 1b somewhere here

Motivated by Croatia's prolonged economic lag and these regional disparities, the research has two main aims: First, to analyse and describe the differences among Croatian regions in terms of Hofstede's cultural dimensions with a view to economic disparities; Second, to explore the relationship between Hofstede's cultural dimensions and regional capacities for innovation and entrepreneurship. The concept of research is given in Figure 2 and a list of variables is presented in Table 2.

Figure 2 somewhere here

Table 2 somewhere here

Based on the presented conceptual model and main aims of the research, the three main hypotheses are established and tested.

Hypothesis 1. *There is a positive correlation between innovation supportive dimensions of national culture and the higher level of regional development*

Hypothesis 2. *Regions with higher score of innovation-supportive dimensions of national culture have higher-level innovation capacity.*

Hypothesis 3. *Regions with higher score of innovation-supportive dimensions of national culture have higher-level of perception of entrepreneurship opportunities*

Since interpretations of Hofstede's cultural dimensions remain contextual and contingent it has been suggested that stereotyping some of them as pro- or anti-innovation

should be avoided [29] [61] [97]. Nevertheless, the existing literature (Table 1) suggests that some dimensions can be considered, as a rule, as more innovation supportive. In the European cultural context, the pro-innovation culture tends to be related to:

High Individualism (IND): In individualistic societies individual achievements, skills, independence and non-conformity are more important than kinship and social bonds, which are more characteristic of collectivistic societies; the latter might prevent the creation of "equal opportunities" and free market competition, which is a *sine qua non* for innovativeness and entrepreneurship;

Low power distance (PDI): Societies with high PDI are based on social privileges, various rules and bureaucratic regulation; employees are not expected to take initiative but to obey the rules. Inequality among people is implicitly embedded in the society and nobody expects that social and economic progress is based on work or innovation;

High Masculinity (MAS): Masculine cultures place great value on achievement, tasks, money, performance, purposefulness. They value organisational characteristics common to innovative organizations: rewards and recognition for performance, and training and improvement of the individual;

Low Uncertainty Avoidance (UAI): Uncertainty avoidance represents discomfort with unstructured or ambiguous situations while innovative activities require uncertainty acceptance, tolerance to risk and change;

Long-term orientation (LTO): a LTO oriented culture values strong work ethic, perseverance, persistence, thriftiness and adapting traditions to new circumstances, all of which supports innovation, coupled with a strong propensity to save and invest for a long term; a short-term oriented culture respects tradition and prefers investing that generates immediate gains;

Indulgence versus Restraint (IVR): Indulgence stands for a society that prefers gratification of needs and desires, enjoying life and having fun while a restraint society controls desires and tends to regulate them by social norms. It is inclined to cynicism and pessimism. IVR is mainly

explored within market research since high levels of indulgence may stimulate the demand for innovations in consumer societies.

Hofstede's latest scores for cultural dimensions of Croatia do not come from his original study of IBM[1], but from a disaggregation of data for ex-Yugoslavia Yugoslavia by the newly created independent states – Croatia, Serbia and Slovenia available at the Hofstede official web page [41], Croatia has developed or inherited dimensions of national culture which are not supportive to innovation. The Power Distance and Uncertainty Avoidance are high, while Individualism, Masculinity and Indulgence are low. The single cultural dimension, which might encourage innovation, is the Long Term Orientation or pragmatism. In general, the Croatian society is highly collectivistic, restrained and risk-avoiding society and has a strong tendency toward social hierarchy. The data were further upgraded by the results obtained in other transition countries [51]. The lack of original data for Croatia and the opportunity to collect them from a representative sample, which has never been done before, provided an additional incentive for this research. Similar research studies conducted in Croatia and selected countries [56] [78] [98] found that Croatian culture is not supportive to innovation.

The composite indicator "Technology and innovation" from the Regional competitiveness index available in only 2014 [72] was taken as a measure of innovation capacity. The composite indicator consist of five sub-indicators which are originally expressed as a single value and is therefore, treated as index of innovation capacities. The innovation index data collected at the county level was recalculated at the regional level for the needs of this analysis.

[1] Geert Hofstede, Dutch social psychologist and Professor Emeritus of organizational anthropology and international management carried out between 1967 and 1973 large research project called Hermes with a view to investigate values' differences in organisational culture across IBM subsidiaries worldwide. He collected data through survey study which involved 117,000 IBM employees from 40 countries [61] [52] and finally resulted in the Hofstede model of "national culture". He defines culture as "collective programming of the mind distinguishing one group or category of people from others" [38].

To measure the entrepreneurship propensity we used TEA[2] opportunity and necessity ratio index from the Global Entrepreneurship Monitor for Croatia [91] as proxy variable for entrepreneurship propensity. Innovative activities and entrepreneurship might be strongly negatively affected by corruption and the lack of the "rule of law" or low trust in institutions, especially in post-communist societies, which favour, for example, clientelistic instead of innovative companies [82]. Since the negative influence of corruption and crime on business and development is evidenced in Croatia [100], the variables of corruption and the "rule of law" from the Regional competitiveness index [72] were also included. The measure of corruption consists of three variables, while the "rule of law" is a composite indicator that includes 5 sub-indicators. The list of variables is given in Table 2.

The indicators of innovation capacities and entrepreneurship opportunities as well as the indicators of corruption and the "rule of law" are based on the perception of the respondents. In order to have the objective measures of regional development, development index [72] and GDP per capita [21] as statistical indictors were included in the correlation matrices.

5. Methodology, data collection and sample

The methodology for cross-cultural regional research in Croatia was based on original Hofstede's Values Survey Module 2013 (VSM 2013) [41] which enables comparison of culturally influenced values of respondents not only from two or more countries but also from regions within countries. The original formulas for calculating each dimension score is given in Appendix 2. The data were collected as part of the Croatian population survey within Pilar's barometer [76]. The survey was carried out from March to May 2015 using probability-based national sample with multi-stage stratified sampling design. The structure of the proportionally stratified samples (with randomly selected units within each stratum) was in line with the

[2] TEA - Total Early-Stage Entrepreneurial Activity

structure of population with respect to gender, age, educational level and employment status (Table 3).

The data were processed by IBM SPSS Statistics 20 software package.

Insert Table 3. about here

6. Results and discussion

The comparative analysis of regions by Hofstede's cultural dimensions (Figure 3) suggests that regions in Croatia are quite different. For example, the largest difference was found between Slavonia and Istria in Uncertainty Avoidance (scores' difference = 48.75), and between Istria and Zagreb in Power Distance (scores' difference = 28.1). However, no explicit relationship between pro-innovation cultural dimensions and the development of the region as measured by GDP per capita and Development index (Figure 1a and 1b) was found.

The highest tolerance to Power Distance, which is usually an innovation-adverse cultural characteristic, was found both in the region of Zagreb, the most economically developed region, and in Lika, one of the least developed Croatian regions. On the other hand, both of these regions had the highest values of Masculinity, which is mostly innovation supportive.

Figure 3 about here

The smallest tolerance of high Power Distance (hierarchy) was found in Istria, which was expected as Istria has reached a relatively high level of economic and democratic

development mainly due to the proximity of Italy and strong tourism. However, the least developed Croatian region, Slavonia (dominated by agriculture), followed immediately after Istria, which suggests that people in the Slavonia region also strive toward social equality. The motives, however, can be quite different and require further investigation. Slavonia also appeared to be one of the most individualistic regions, and its score on this measure was the closest to the scores of the most developed regions of Zagreb and Istria. Moreover, it was interesting that people in Istria, who have a relatively high standard of living, had considerably higher values of Uncertainty Avoidance than the inhabitants of other regions. On the other hand, the least developed regions of Slavonia and Lika have developed Uncertainty Acceptance. Lika is the region with the highest Masculinity, which can be considered as their historical heritage of traditional tribal patriarchalism and of their military past (known as the Military Frontier against the Ottomans). It is followed by Zagreb and Dalmatia, whose scores for Masculinity are above the Croatian average.

Next, the most developed regions of Zagreb and Istria have the lowest levels of Long Term Orientation or pragmatism while the highest values are found in less developed regions of North Croatia and Lika. Finally, the regions with the highest level of Indulgence were Zagreb (most developed) and Slavonia (least developed), while North Croatia and Istria are the most restrictive. The largest differences among the six regions by cultural dimension were in Indulgence, followed by Power Distance and Uncertainty Avoidance. The regions were more homogenous regarding Individualism, Masculinity and Long Term Orientation.

The analysis suggests that the regions differ significantly with respect to cultural dimensions but there is no consistent relationship among the cultural dimensions measured and regional economic circumstances. The combination of cultural dimensions which usually spurs innovation or economic development has not been identified. Pro-innovation cultural dimensions are scattered all over Croatia and are not specific for more developed regions. For example, Zagreb as the most advanced region is characterised by both pro-innovation cultural

dimensions (high MAS, IND and IVR) and innovation-adverse values (high PDI and UAI and low LTO). In fact, the region which appeared to have most innovation-supportive culture turned out to be the least developed region: Slavonia demonstrated more favourable scores on 4 pro–innovation cultural dimensions when compared to the Croatian average: higher IND and IVR and lower PDI and UAI, while LTO and MAS were below the Croatian average. By contrast, Istria exceeded the Croatian average in only two pro-innovation cultural dimensions: lower PDI and higher IND. Therefore, the hypothesis 1 is rejected.

The correlation matrix (Table 4) revealed that none of the cultural dimensions had any significant relationship to innovation measured by the innovation index composite indicator "Technology and innovation" [71]. Therefore, the hypothesis 2 is rejected. The only cultural dimension significantly correlated to entrepreneurship propensity measured by TEA index [91] was dimension of LTO (Long Term Orientation), where low to medium score on this dimension is considered, according to previous research, to be in favour of innovation and entrepreneurship [37] [79] .

Insert Table 4 here

Significant correlation between the cultural dimensions and the examined variables included correlations with corruption and "the rule of law". Corruption was negatively correlated with Masculinity and Indulgence, which probably means that people in the regions dominated by these cultural orientations tend to have less confidence in the financial honesty and incorruptibility of local politicians and businessmen/company managers. Furthermore, there was a positive relationship between "the rule of law" and Long Term Orientation, which suggests that people in regions with a stronger legal framework, a smaller rate of grey economy and less organised crime have a stronger inclination to Long Term Orientation. Significant negative correlation between the TEA index and the rule of law may suggest that the population

in more developed regions with more opportunity entrepreneurship has higher criteria for the rule of law.

In order to test our hypotheses regression analysis was applied. In the multiple regression model we have tested if cultural dimensions and two independent variables concerning corruption and rule of law are predictors of entrepreneurial propensity. We have included in the model only those independent variables with significant correlation (Table 5). They explain 89% of variance in TEA index. In view of the fact that LTO is the only predictor of TEA suggests that the regional differences in entrepreneurship might be only fragmentary explained by cultural difference. Since beta coefficient is negative, Long Term Orientation might be interpreted as a kind of pragmatism that affect higher entrepreneurial propensity (Table 5). Therefore, the hypothesis 3 is partly rejected.

Clearly, the regional entrepreneurial capital and the underlying factors should be thoroughly investigated.

Insert Table 5 here

This research provides the empirical verification of the Hofstede model applied on the cross-regional level. It showed that many criticisms addressed to the whole cultural approach in business management research, especially the Hofstede's model of national value systems and behaviour, has been realistically met with a considerable amount of criticism [99] [18] [52] [25]. The Hofstede's theory of national culture has been criticised for being meaningless, naive and de-contextualised concept of culture, based on simplified over-empirical methodology and out-dated, as summarized by Taylor and Wilson [97], Dermot [25] and Touburg [99]. Many of these criticisms are confirmed by our analyses and appropriate conclusions have been drawn to warn how simplicity of the model can be seductive but results worthless. Jago [47] pointed out

that *"countries are different from each other (as demonstrated by Hofstede); managers, within-country, are also different from each other (as demonstrated by Gerhart/Fang/van Hoorn). But managers also vary their behavior within their own "overall style" (or around their "average behavior")*

5.1. Strengths and limitations

The strength of this study lies in fact that this is the first study that investigated the cultural embeddedness of innovation capacity and entrepreneurship propensity on regional level in the innovation weak post-transition European country. Dimensions of national culture are measured on the national survey data and representative sample using the latest Hofstede's Values Survey Module that gives us the opportunity to test previous Hofstede's scores. This research explores both predictions about the relationship of Hofstede's cultural dimensions with innovation and entrepreneurship and suggests consideration of the other socio - economic and political factors. The limitations concern the limited explanatory power of Hofstede's scores for regional disparities in economic and social development.

6. Conclusions

Regardless of the differences among regions in terms of cultural dimensions, especially concerning IVR, PDI and UAI, statistical evidence does not support a link between regional culture and regional economic development. Surprisingly, the most pro-innovation cultural dimensions were identified in the economically least developed region of Slavonia, which is mostly agrarian and suffers recently from the massive emigration of the population. Such findings suggest that the interpretation of the cultural dimensions is contextual to the extent they require further research to explain why some regions developed certain cultural characteristics and what their true meaning is within the local environment.

The correlation matrix revealed that the dimension of culture framed by Hofstede's model are not linked to innovation in Croatia. The only Hofstede's dimension with significant

correlation with entrepreneurship is Long Term Orientation that is insufficient to support the thesis of cultural impact on entrepreneurship and innovation. The regions with pro-innovation cultural dimensions determined according to Hofstede's model showed little innovation or entrepreneurship propensity. The impact of corruption on innovation and entrepreneurship, which was proven in previous research [100], also showed a weak link with the cultural dimensions. The "rule of law" was related only to Long Term Orientation, which finding requires further investigation to explain this relationship.

Drawing on the results of this research and taking into account the findings of other scholars, several conclusions can be drawn. First, in-country cross-regional cultural research should be driven by a good reason since differentiation between the regions may not always be useful and relevant [51]. Despite the fact that this research was carefully designed and carried out to test a valid and rather intriguing research question, its results have fallen short of expectations. This re-affirmed the suggestion of Kirkman et al. [52]: one should refrain from producing yet another study inspired by Hofstede's model unless there are substantial reasons for it.

Second, from the methodological point of view, the Hofstede's model is highly debatable. His methodology which is publicly available and had appealing simplicity (the questionnaire includes only 24 simple questions) for numerous researchers is also "deceptively straightforward" as emphasised by Touburg [99]. It hides some methodological difficulties that are not visible at first sight. First, the obtained values of cultural dimensions are not absolute measures but represent a relative position of the units of analyses within each research (see Hofstede [40]). This is because the index of cultural dimensions requires a "calibration" of the score values to the range between 0 and 100, which makes each research study, including this one, unique and does not allow for comparisons of research results from different studies. It hinders the replicability of the results, which is one of the essential normative features of the scientific analytical method. This supports the findings of Kirkman et al. [52] who concluded

that “much of the Hofstede-inspired research has remained fragmented and in some cases redundant, and researchers are unable to benefit from the cumulative knowledge that accrues from an integrated body of quality research”.

The results of our analysis proved that Hofstede’s model of national culture measured by his index has “*failed to deliver on its promise*” [9]. Not only have that dimensions been considered with same significance across nations but it also raised the question how valid was to treat nations or regions as variables. Hofstede gave no satisfactory explanation why nation-states (or regions and other locally interested items) are the units of analysis, despite his repeated cautions that his dimensions are meaningless on individual level. Aggregated values of the dimensions in the index do not make sense in many cases.

Third, the cultural dimensions turned out to be “content empty” regarding the real nature of innovation culture and failed to explain economic growth and propensity to innovation and entrepreneurship, at least at the within-country regional level. Therefore these results confirm one of the most important objections to Hofstede’s framework as “an overly simplistic four or five dimension conceptualization of culture” [52] or culture which is understood in an ultra-narrow, naive and decontextualised way [64] [67]. This concept does not reflect the complexity of a national culture consisting of mutually related elements that build culture - such as beliefs, values, norms, attitudes and meanings. It confirms previous conclusions that his model falls short of expectations in describing national culture [101] and turned out to be of no practical value for managers [99].

The results support the suggestion that researchers should move beyond cultural research inspired by Hofstede [52], especially as regards innovation propensity, and entrepreneurship culture since this kind of research has not progressed much since Shane’s [88] [89] seminal articles [97] and include different aspects such as agency culture [12] [19]. The implications for regional development in Croatia are rather straightforward.

First, the results suggest that structural factors rather than cultural values determine regional innovation and entrepreneurship propensity. It means that the local socio-economic context and institutional environment, such as industrial and employment patterns, availability of knowledge, supporting institutions, regulations and similar more 'tangible' factors should be addressed by deliberate actions of regional policy to create innovation supportive environment.

Second, corruption and crony capitalism, that has mushroomed during transition to market economy [30] [33] [95], slowed down propensity to innovation and entrepreneurship in much greater extent than dimensions of national culture. The pace of institutional change [93] and related social capability [32] could have much better practical policy implications than cultural characteristics which can hardly be changed or directed by policy actions.

Third, the new concepts of economic geography and place-based arguments pertaining to growth [55] especially Barca report [8] provide much more practical approach to regional development than dwelling on cultural factors. Taking into account a region's contextual factors these concepts emphasise the importance of regulatory and institutional framework, governance of innovation and mechanism of the European cohesion policy for strengthening innovation and entrepreneurship.

This is closely related to the fourth implication for regional development for Croatia which concerns the Smart specialisation strategy [33] as the efficient mechanism of the European cohesion policy to accelerate convergence of less developed countries like Croatia.

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Figure 1a

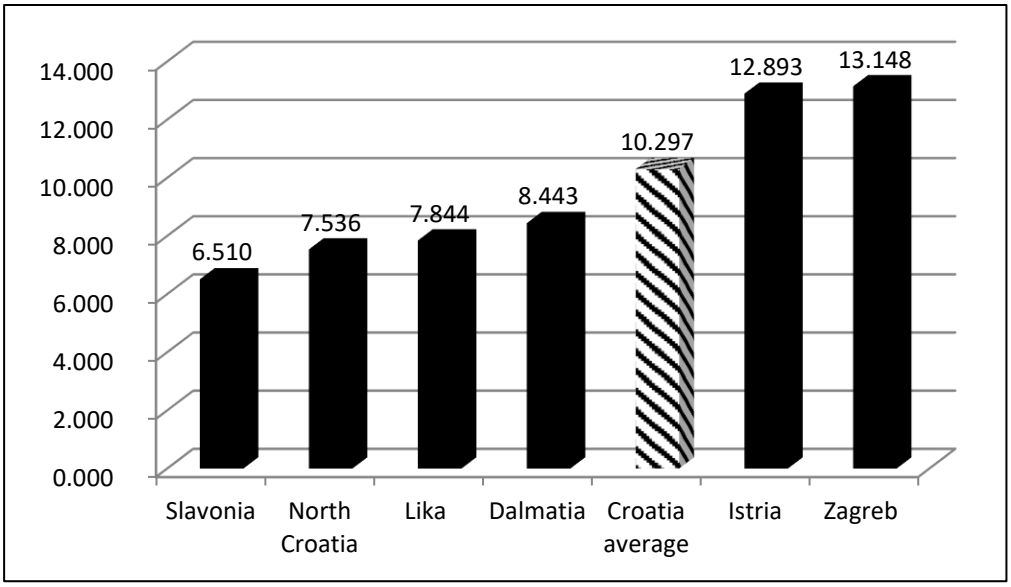


Figure 1a. Regions by GDP p/c, 2012 (in €)

Source: [21]

Figure 1b

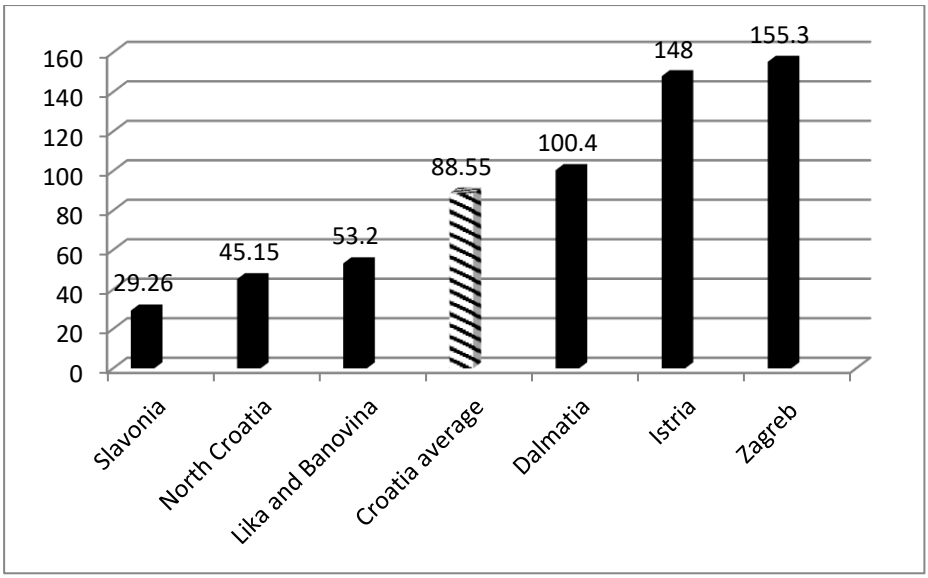


Figure 1b. Regions by Development index 2013

Source: [72]

Figure 2

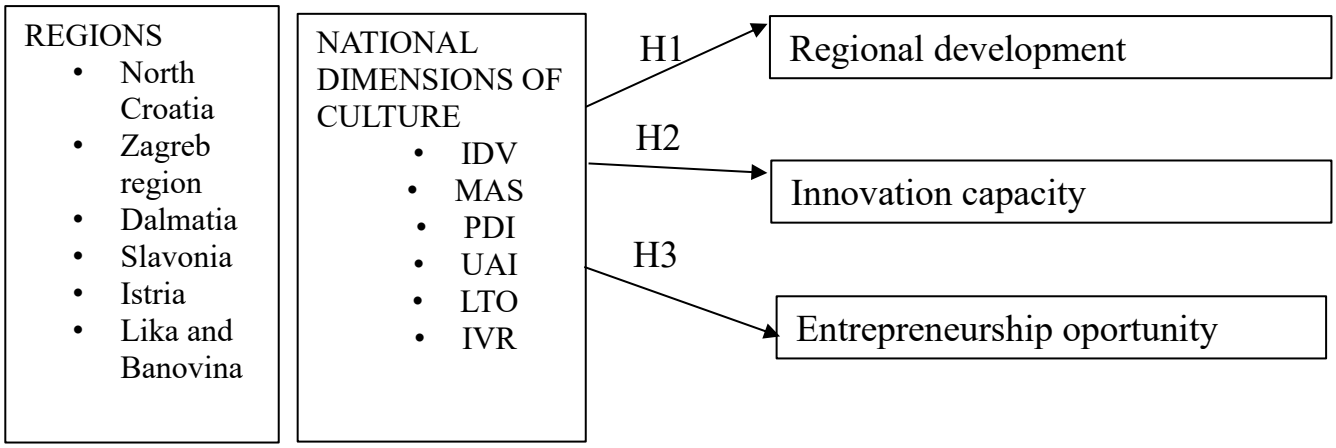
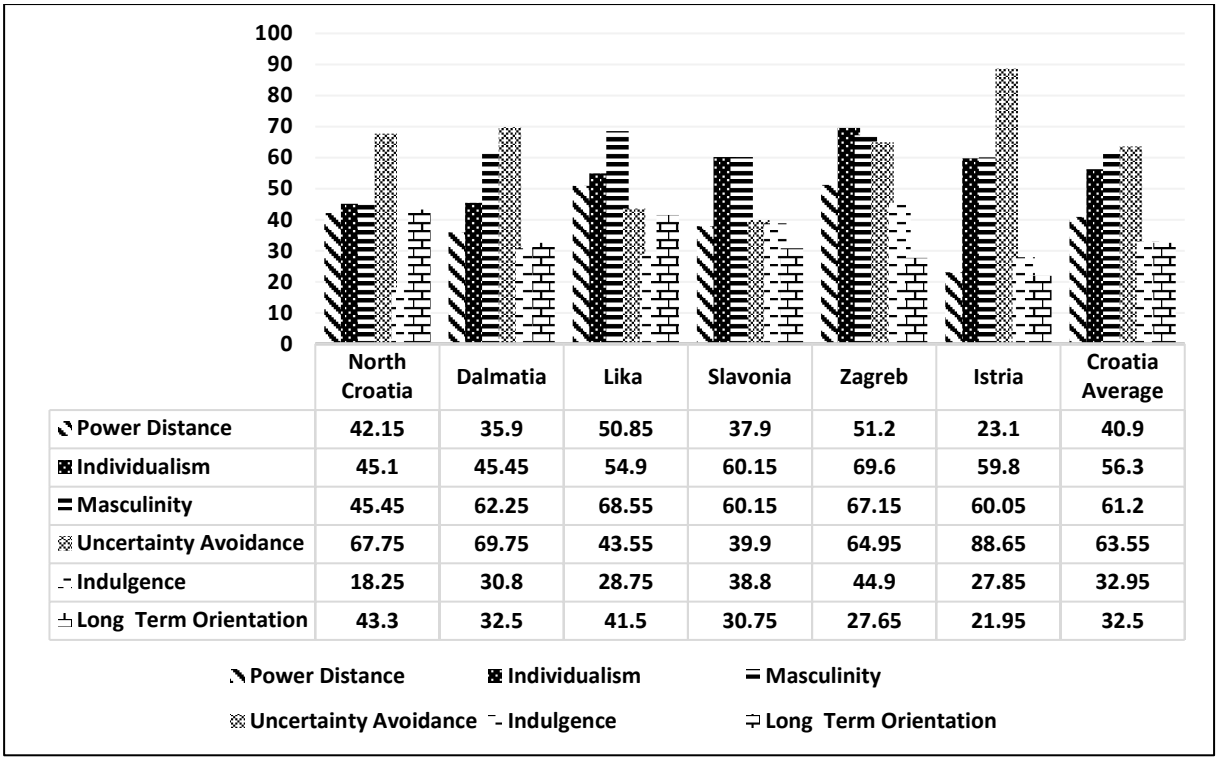


Figure 2. The conceptual model of research

Figure 3



	North Croatia	Dalmatia	Lika	Slavonia	Zagreb	Istria	Croatia Average
Power Distance	42.15	35.9	50.85	37.9	51.2	23.1	40.9
Individualism	45.1	45.45	54.9	60.15	69.6	59.8	56.3
Masculinity	45.45	62.25	68.55	60.15	67.15	60.05	61.2
Uncertainty Avoidance	67.75	69.75	43.55	39.9	64.95	88.65	63.55
Indulgence	18.25	30.8	28.75	38.8	44.9	27.85	32.95
Long Term Orientation	43.3	32.5	41.5	30.75	27.65	21.95	32.5

Figure 3. Regions by Hofstede's cultural dimensions

Table 1: An overview of the cross-cultural studies of national propensity to innovation based on Hofstede's cultural dimensions

Authors	Main message
Shane (1992)	Strong correlation between lower Power Distance (social hierarchy) and higher Individualism with national innovativeness as measured by the invention patents granted
Shane (1993)	Uncertainty Acceptance, lack of Power Distance and Individualism are related to high rates of innovation; Masculinity is neutral
Shane *et al.*(1995)	There is a correlation between Uncertainty Avoidance, Collectivism and Power Distance and the preferred strategies of innovation champions
Nakata, C. and Sivakumar, K. (1996)	Influence of Masculinity on innovation is positive in the implementation stage only; in the initiation stage, low Power Distance and Uncertainty Avoidance, High Individualism, Femininity, and Confucian Dynamism have a positive influence.
Van Everdingen et al. (2003)	Strong influence of national culture (Uncertainty Avoidance, Masculinity, Power Distance, the low-context and monochronic cultures) on innovation adoption rate measured by ERP adoption.
Allred and Swan (2004)	Individualism, low Power Distance, and low Uncertainty Avoidance are more positively related to innovation within multidomestic industries; Confucian dynamism is more positively related to innovation within global industries.
Vecchi and Brennan (2009)	The findings on Power Distance, Individualism and Masculinity partially conflict with Hofstede's and Shane's findings: the links between these dimensions and national innovation performance have not been confirmed.
Taylor and Wilson (2012)	Shane's finding of the influence of Individualism on innovation is examined by triangulation of Hofstede's, Schwartz's and GLOBE's research.
Williams and McGuire (2010)	Culture measured by Power Proximity, Uncertainty Acceptance and Individualism positively affected economic creativity and innovation.
Kaasa and Vadi (2010)	Successful innovation as measured by patenting at the regional EU level (NUTS) is related to low Power Distance, Uncertainty Avoidance, family-related Collectivism and lower than average Masculinity; the role of Individualism seems weak.
Rinne et al. (2012)	Individualism and low Power Distance are positively related to innovation as measured by the GII, while no relationship of Uncertainty Avoidance and innovation has been identified.
Kaasa (2013)	Power Distance, Uncertainty Avoidance and Masculinity turned out to be negatively and Individualism positively related to innovation performance.
Mueller, et al. (2013)	Exploratory innovations benefit from high Power Distance, high Collectivism and low Uncertainty Avoidance, while their influence on exploitative innovations is ambiguous.
Efrat, 2014	The national culture matters in the era of globalised economy; specifically Individualism, Masculinity and Uncertainty Avoidance
Sebastian (2014)	Long-term Orientation or Confucian Dynamism positively influences national innovativeness
Griffit and Rubera (2014)	The increase in Individualism and Indulgence has a positive effect on design whereas the increase in Uncertainty Avoidance and Indulgence has a negative effect on technological innovations.
Desmarchelier, B. and Fang. E.S. (2016)	From the perspective of agent-based model, Uncertainty Avoidance has a negative impact on diffusion of innovation whereas Individualism has a positive impact

Table 2 List of variables

Dependent variables	
Regional development level	• Development index; • GDP per capita
Innovation capacities (Innovation index)	• Technological development based on own research; • Use of sophisticated production technology; • Share of production of higher added value; • Company's product (design, marketing)of the total export ; • Investment of companies in research and development
Entrepreneurship opportunity	• TEA Indeks- Opportunity and necessity ratio index.
Independent variables	
Perception of corruption	• Public confidence in financial honesty of local politicians; • Impartiality and incorruptibility of public officials • Impact of corruption on the company's business in the county
Perception of 'rule of law'	• Level of "gray economy" in the county; • Effectiveness and neutrality of the legal framework; • Legal protection of property rights and claims; • Incidence of organized crime in the county; • Independence of the judiciary from political influence

Table 3. Sample – descriptive statistics

	N	%
GENDER		
Male	483	48.3
Female	517	51.7
AGE		
18-30	223	22.3
31-50	343	34.3
51-60	199	19.9
61-	235	23.5
EDUCATION		
8 years and less	264	26.4
11 – 12 years	552	55.2
14 years and more	184	18.4
EMPLOYMENT		
Employed	454	45.4
Students	107	10.7
Unemployed, retired, unpaid family workers	422	42.2
Missing	17	1.7
REGION		
Zagreb and surroundings	251	25.1
North Croatia	182	18.2
Istria and Primorje	119	11.9
Dalmatia	196	19.6
Slavonia and Baranja	168	16.8
Lika, Banovina and Moslavina	84	8.4
TOTAL	1000	

Table 4. Correlation matrix

		1	2	3	4	5	6	7	8	9	10	11	12
1	PDI	1.000	.257	.543	-.600	.371	.314	.086	.086	.348	.257	-.657	-.371
2	IND	.257	1.000	.371	-.371	.771	-.771	.371	.371	-.696	.029	-.714	.657
3	MAS	.543	.371	1.000	-.429	.600	-.029	.314	.314	-.058	-.257	-.886*	-.257
4	UA	-.600	-.371	-.429	1.000	-.486	-.257	.543	.543	-.377	.371	.600	.371
5	IVR	.371	.771	.600	-.486	1.000	-.429	.257	.257	-.406	.143	-.829*	.314
6	LTO	.314	-.771	-.029	-.257	-.429	1.000	-.600	-.600	.986**	-.086	.257	-.943**
7	GDP p/c	.086	.371	.314	.543	.257	-.600	1.000	1.000**	-.696	.486	-.314	.543
8	Development index	.086	.371	.314	.543	.257	-.600	1.000**	1.000	-.696	.486	-.314	.543
9	Rule of law	.348	-.696	-.058	-.377	-.406	**.986****	-.696	-.696	1.000	-.145	.232	-.928**
10	Technology & innovation	.257	.029	-.257	.371	.143	-.086	.486	.486	-.145	1.000	.086	.314
11	Corruption	-.657	-.714	**-.886***	.600	**-.829***	.257	-.314	-.314	.232	.086	1.000	-.029
12	TEA opportunity vs. necessity	-.371	.657	-.257	.371	.314	**-.943****	.543	.543	**-.928****	.314	-.029	1.000

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Table 5

Regression results for entrepreneurship propensity

	TEA index opportunity vs necessity		
Predictors	*Beta*	*t*	*Sig.*
LTO	-2.434	-3.521	.039*
Rule of Law	1.657	2.398	.096
R	.947		
R^2	.897		
F change	13.105		
Sig. F change	.033		

*$p < 0.05$

Appendix 1. Regions in Croatia constructed for the purpose of this research

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Appendix 2.

Formulas for calculation of the Hofstede's score values ranging from 0 to 100:

PDI = 35(m07 – m02) + 25(m20 – m23) +25;

IDV = 35(m04 – m01) + 35(m09 – m06) + 30;

MAS = 35(m05 – m03) + 35(m08 – m10) + 50;

UAI = 40(m18 - m15) + 25(m21 – m24) + 105;

LTO = 40(m13 – m14) + 25(m19 – m22) + 30,

IVR = 35(m12 – m11) + 40(m17 – m16) -25.