

# Business environment and HEIs: Grasping the factors of innovations as an interplay between developmental performances and human semantic meanings

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*Abstract:* - Throughout the history, innovations have been addressed from different perspectives contributing to the extensive knowledgebase. But what are the crucial constituent of the harmonized external and internal factors, which have a direct impact on the business, known as value orientations? Our study aims to reveal an underlying dynamics framing the possibilities of knowledge creation and fostering innovation since postmodern orientations and values have an impact on the innovative, creative and reflexive capacities. We took into account the individual characteristics, both sociographic and demographic, as well as postmodern orientations and values, indicators measuring changed cognitive frames, values and orientations we choose perceptions of being autonomous individuals, having an active imagination, supporting technological development and also what are the important child qualities. The results showed that being prone to innovations is influenced by specific social embeddedness of personalities at the individual level and also at the national level as well as that tertiary education does not encourage individuals thinking with their own head, neither being creative or innovative, which at first glance may see counterintuitive.

*Key-Words:* - Innovation factors, Developmental performance, Semantic meaning, Hierarchical regression analysis, Global innovation index, Human Development Index.

## 1 Introduction

The chapter addresses the tremendous need for the effective and successful cooperation between business environment and higher education institutions (HEIs) from the specific point of view deploying the concepts of innovation, reflexivity and strategic steering. It emphasizes the role of certain social structural settings and deliberate consideration of individuals in establishing conditions for creative dialogue between different actors in a particular social (and business) environment. It aims to reveal an underlying dynamics framing the possibilities of knowledge creation and fostering innovation in a particular business environment.

There are many external constraints influencing the effective business performances linked to technological factors, political factors, macro-economic and social factors. In the era of global uncertainty and accelerated risks demarcating business environments, the important role in establishing favorable conditions for business to enhance and maintain developmental performances, is played by innovations transforming external constrains to enablement's and opportunities. Innovative capacities of a certain business

environment are however conditioned with similar macro structural features as other social environments. In order for innovative society to emerge, there are certain social structural and semantic conditions allowing innovative networks to be established, maintained and reproduced. It has been argued that factors enabling innovation activities are new products and patents closely intertwined with general progress in scientific and technological endeavors in a certain social environment [1-3].

The important processes towards better innovative capacities and performances therefore occur also on the mezzo level of the business environment. On the mid-range level, innovations represent a crucial constituent of the harmonized external and internal factors, which have a direct impact on the business, known as value orientations, objectives, management structures and visions. One of the crucial players in business environments directly linked to the field of innovations are HEIs, as they contribute to generating new ideas and knowledge transfers. The increased need of practical applications of the knowledge has offer HEIs to establish a concrete and productive linkages with government and industry thus forming a triple-helix

formation. The role of HEIs in that regard should reach beyond the knowledge creation and transfer only. While representing a social bond of different actors in innovation network, it reduces uncertainty of contemporary business activities through cooperation among agents, and facilitates the production and sharing of knowledge and also of other resources needed [4-9].

The HEIs are, however, not just organizations but also individuals taking part in the educational process. While innovations are often considered on a large societal scales and mezzo levels of innovation processes, the aspect of individuals, their efforts and semantic representations are often neglected. What is meant here, are not just structural demographic features of one society, but creative and innovative capacities of humans? The purpose of the present text is to bridge that gap. The focus is on the interplay between societal levels and individuals' capacities in forming innovative society and particularly addressing the role of the letter in that regards. In order to achieve our goal, we firstly represent theoretical framework explaining the ontological views on the relation between social structure and individual mental abilities in innovative processes. The main idea lies in the recognition of both levels as two emergent, auto-poetic entities [10-11]. The important role played in the interaction of both levels, which can lead to innovative strategies and developmental performances, is ascribed to the capacity of being reflexive, which can be attributed to both emergent levels, although we predominantly focus on individual reflexive deliberations. The theoretical explanations are needed to propose the model elucidating the interplay of both levels, which can also be operationalized. The empirical part of the chapter therefore concretizes and validate the theoretical ideas and presumptions. For these purposes we constructed a two-level hierarchical regression model [12]. As a national level independent variable, we measure national developmental performances (material welfare, health and education) using Human Development Index (HDI) provided by United Nations [13] as well as Global Innovation Index (GII) provided by Cornell University [14]. Individual innovative and creative potential as well as other values and demographic characteristics, on the other hand, are available in World Value Survey Round 6 [15].

## 2 Problem Formulation

The main aim of the research is to reveal which factors influence capacities of individuals to be

innovative and creative on individual level as well as on national level, and what is the role of the HEIs in that regard. On the individual level we are interested whether we can observe innovations as resulting from the structural settings while controlling for demographic specificities and value orientations. On a macro level, we are interested in explaining the role of developmental performances of a country.

Since the emergence of industrial revolution, human society has become permeated with novelties offering new commodities, technologies and ideas transforming social resources structuring economic, political and cultural institutions and actions. Innovations are therefore not just material manifestations of technological progress, but even more are social processes [2,17], which occur on different societal levels. Innovations are entwined with systemic reproduction of particular sub-systems and also with activities of individuals. The innovations as social processes refer to various phenomena, such as competitiveness of firms [17], cognitive mobilization, social capital, and quality of governance [18], which are conditioned by structural settings of particular social environment, but also by concrete actions of individuals. Innovations are seen as an integral part of contemporary social order demarcated by fluidity, global connectivity and higher level of social instability. They are not just products enabling technological and economic development but social processes resulting from the modernization, post-industrialization and technological expansion. An increasing need for innovations in various social spheres, i.e. economic, social, environmental etc. is imprinted in structural settings of particular social environment understood as imperative "of late modernity" [20], or "reflexive modernity" [21].

Due to the changing and more fluid structural settings, the relationship between actors and social environments indicates various techniques of adaptation and adjustments to the social context, and innovations can be seen as processes triggered from such actions. Certain structural settings and semiotic influences of the social environment, following structural changes, can enhance the possibility to steer on a systemic level and also in the emergent relations with individual actors, or it can be individuals that trigger systems' structural properties to respond to their strategies. There is an interplay between both levels contributing to the emergence and the existence of

innovation society. It is therefore argued that innovation society can be observed on both levels, although the prevalence of existing studies points more to structural constellations and features of macro societal level. While considering innovations as a social process or a product, it is crucial to take account of actors and their orientations with the same curiosity and seriousness. Innovation as a product of reflexive strategic steering between social subsystems and individuals indicates not only that novelty “is ‘just there,’ but is produced in such a way as to be understood by someone else” [22]. The semiotics of the social systems and humans can also have the opposite effect, which points to substantial differences in developmental performances among certain national societies.

The increasing complexity of the social order and differentiation of social domains have induced the strong need for innovative developmental strategies among different societal levels enabling to keep pace with immense social and technological transformations. Particular local environment, region or national state can no longer be understood solely in terms of physical geographical units but rather in the light of structural and semiotic transformations referring to post-national, global-local constellations, which demand formulation of specific developmental strategies to achieve global competitiveness. In order to achieve high developmental performances, all the types of social systems, i.e. functional sub-systems, segmental sub-systems [10] and individuals, should articulate effective strategic plans of development and they should also be highly compatible with each other. The issue of developmental strategies leads us to the concept of strategic steering, as a necessary tool for achieving high developmental performances [23]. In order for social systems to be compatible, the differentiated systems have to take into account their articulated principles, strengthen their reflection abilities and intervene in highly contextualized terms [23]. The capability to steer developmental strategies and deploy reflexive deliberations on both levels is crucial, as individual actions, no matter how good they may be planned, cannot directly influence the processes on the systemic level and vice-versa. There can only be structural coupling. The effectiveness of strategic steering is thus a product of the interplay between both levels, which is not necessarily compatible in all aspects.

Ensuing from conceptualizations of the interplay between both levels in forming innovative society and addressing the role of individuals in that regards, we propose two hypotheses

*H1: Being prone to innovations is influenced by specific social embeddedness of personalities at the individual level and also at the national level – the more is individual endowed with particular resources, more is prone to innovations, and more those resources are present on a national level in general, they influence the outcome*

*H2: Among factors influencing ‘being innovative’ on a micro-level, the important role is played by the tertiary education.*

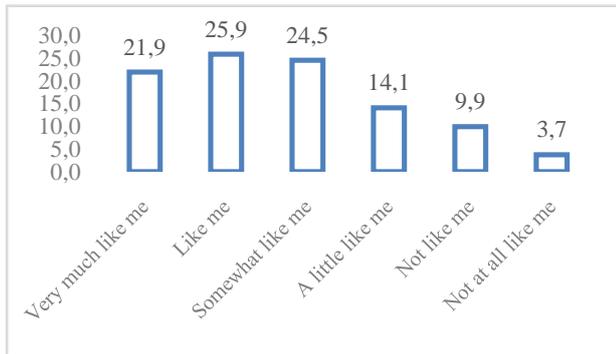
### 3 Operationalization

#### 2.1 Dependent variable – being prone to innovations

Proposing the validate measure presenting an innovation semantics is certainly not an easy task. As Knoblauh [22] proposes, historical semantics of innovation refer to the words such as creation,” “renewal,” or “novelty”, but not just in a diachronic perspective, but also in a synchronic revealing related associations to the innovation. It is argued that factors triggering innovations in a certain social environment can be observed also in mental structures of individuals, who are encouraged to be more creative, reflexive and imaginative in pursuing own life-goals. Such as we perceive certain processes or products as an indicator for innovations society, there are semantic representations, or the ways of systems self-descriptions, that underpin those products to be understood in that manner [22]. In order to elucidate factors of innovative society as an interplay between social and human level at the macro level, we have to opt for most validate approximations offered by available databases. On the one hand, the semantic meanings of innovations in general refer to something being ‘new’ and ‘creative’, both framed by the reflexive capacities of the contemporary social reality.

On individual level we tool into the analysis indicators that were interesting from the theoretical point of view when trying to explain innovative and creative potential of an individual. On a 6-point Likert scale people were asked whether it is important for them to think up new ideas and be creative; to do things their own way, where 1 “Very much like me”, 6 “Not at all like me” (Fig1), with the average value of 2,75 and standard error of 1,4. The variable was used as a dependent variable in the hierarchical regression model.

Fig1: It is important for them to think up new ideas and be creative



Source: WVS6.

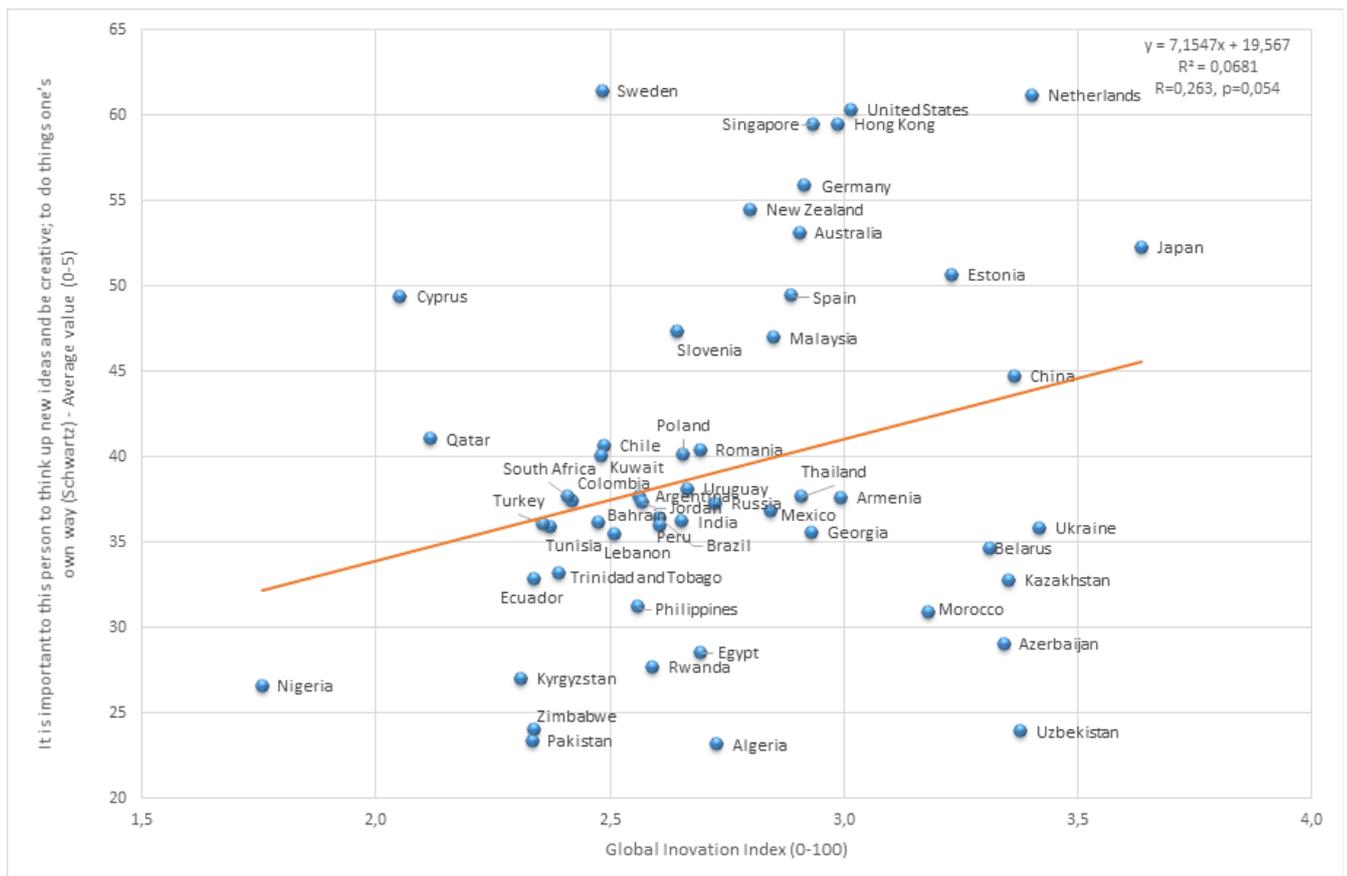
From Fig2 we can see that there is a weak link between being creative or prone to think up new ideas with the Global Innovation Index on national level. Here we are questioning whether the GII really measure innovativeness or is there such a discrepancy between semantic of innovation and actual innovations.

**2.1 Dependent variable – being prone to innovations**

**2.1.1 Socio-cultural values and orientations**

Values and orientations are seen as an important independent variable, because they substantiate cognitive frames of one’s society. In traditional societies, predominant values emphasized the role of collectivity and impeded individuals’ creativity.

Fig2: It is important for them to think up new ideas and be creative



Source: GII 2013.

From the diagram we can see that there is a weak link between being creative or prone to think up new ideas with the Global Innovation Index on national level. Here we are questioning whether the

GII [15] really measure innovativeness or is there such a discrepancy between semantic of innovation and actual innovations.

A milestone in changing values and orientations has occurred in the intersection between the modern and late-modern era. The former

commenced with the industrialization based on the mass production and bureaucratic organizations. The expansion of new products resulted from the effective but very much routinized social processes constraining individual's autonomy. The post-modern or late-modern society has become signified by a new system of values [24]. Hierarchical, bureaucratic institutions ceased to be highly valued as the individual autonomy has gained a significant relevance. Increased demands for personal freedom have undermined traditional values and routines. In line with individualization processes, the cultural-socio frames have changed emphasizing individual responsibility, autonomy and sovereignty. It is argued that postmodern orientations and values have an impact on the innovative, creative and reflexive capacities.

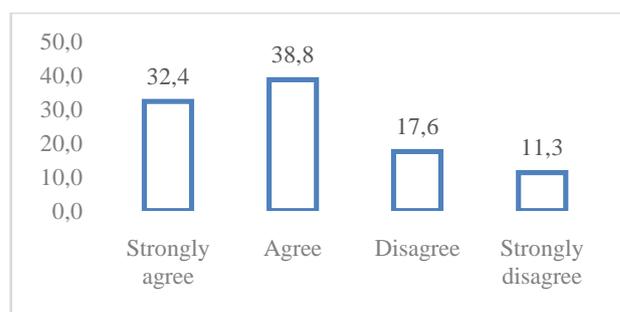
As important indicators measuring changed cognitive frames, values and orientations we choose perceptions of being autonomous individuals, having an active imagination, supporting technological development and also what are the important child qualities. Individualized social order is supposed to priorities creative and imaginative competences in raising children over the material values of being a hard-working person.

On a 4- point Likert scale people were asked whether in their see themselves as autonomous individuals, where 1 "Strongly agree", 10 "Strongly disagree". The majority of respondents agreed that they see themselves as autonomous individuals (38.8 %). On a 10 - point Likert scale people were asked whether in their opinion "The world is better off, or worse off, because of science and technology", where 1 "A lot worse off", 10 "A lot better off", with the average value of 7.25 and standard error of 2.3.

Imaginative power was measured through the question about important child qualities. Among all the respondents of WVS6 [16] (n=82029), 24.6 % mentioned imagination as an important child quality.

From Fig3 we can see that 32.4 % of respondents see themselves as autonomous individuals, 38.8 % agree, while on the other hand we have 28.9 % of respondents, who either disagree or strongly disagree with the statement.

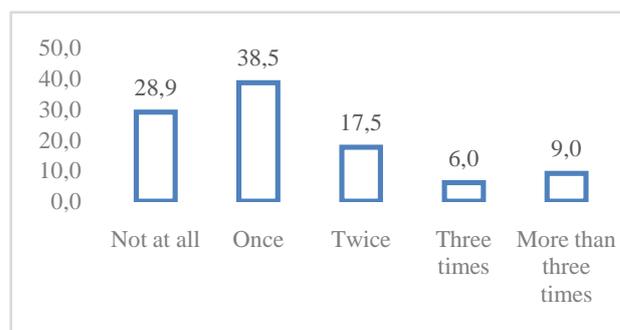
Fig3: I see myself as an s autonomous individual



Source: WVS6 [16].

From Fig4 we can see that 28.9 % of respondents never signed a petition. 38.5 % did it once, 17.5 % twice, only 6.0 % of respondents did signed a petition three times, while 9.0 % more than three times.

Fig4: Political action recently done: Signing a petition



Source: WVS6 [15].

### 2.1.1 Structural contextuality

In line with the hypotheses proposed, we have also taken into account the individual's age, gender and education (with the special emphasis on a tertiary level) that may influence the depended variable.

## 3 Analysis

In social science multilevel data are quite common, thus the application of statistical methods that take into consideration hierarchically structured data are the most appropriate [12]. Using hierarchical linear regression method we are able to include in a model a two-level hierarchy: individual level and national level. Such models are complex and therefore makes it difficult for researchers to in-depth understand all the relations between variables on both levels. This is also an important shortcoming of such complex methods.

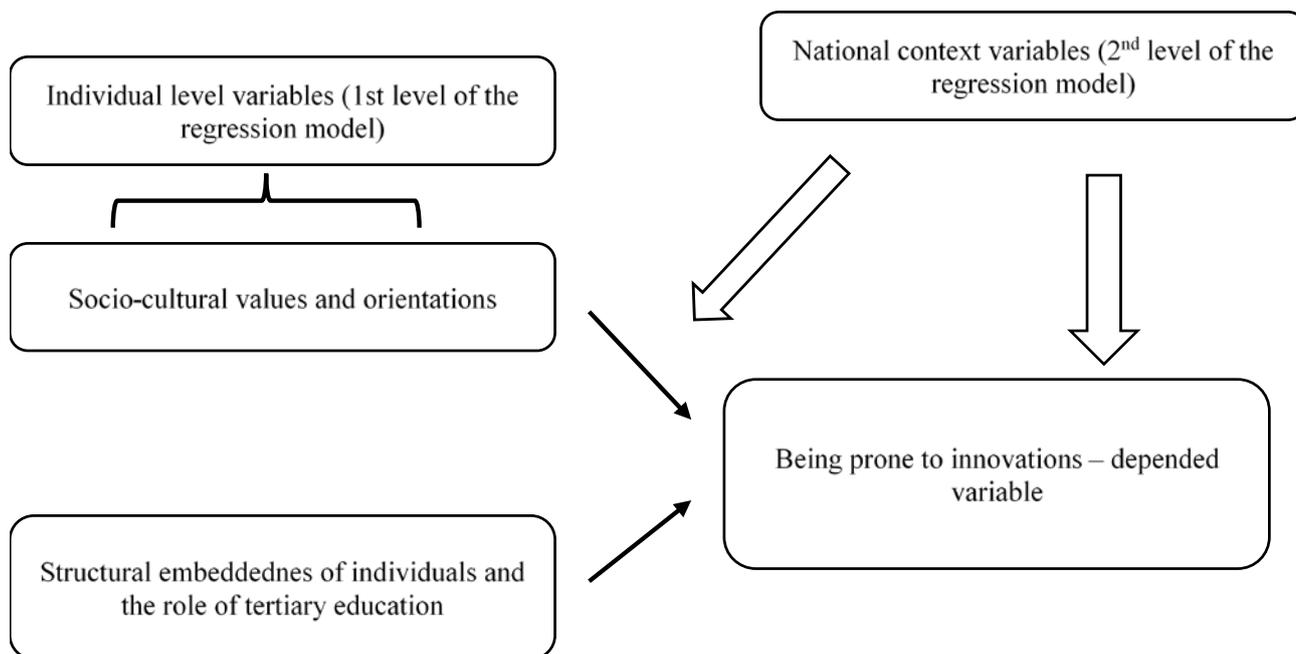
Controlling for the individual socio demographic characteristics and considering other individual characteristics as well as national

developmental performances we constructed a two-level hierarchical linear regression HML2 using HLM 7 software as stated below:

$$\gamma_{60} \times INCOME_{ij} + \gamma_{70} \times AGE_{ij} + \gamma_{80} \times FEMALE_{ij} + \gamma_{90} \times TERTIARY_{ij} + u_{0j} + r_{ij} \quad (1)$$

$$INNOV_{ij} = \gamma_{00} + \gamma_{01} \times HDI_{ij} + \gamma_{10} \times IMAG\_CH_{ij} + \gamma_{20} \times IMAG_{ij} + \gamma_{30} \times PETITION_{ij} + \gamma_{40} \times SCIENCE_{ij} + \gamma_{50} \times AUTO_{ij} +$$

Fig 5: Structural contextuality



where *INNOV* stands for Innovative and creative individual potential, *HDI* for Human Development Index, *IMAG\_CH* for important child qualities: Imagination, *IMAG* for I see myself as someone who: has an active imagination, *PETITION* for political action recently done: Signing a petition, *SCIENCE* - “The world is better off, or worse off, because of science and technology”, *AUTONOM* for I see myself as an autonomous individual, *INCOME* for individual’s income on 10 point scale, *AGE* for individual’s age, *FEMALE* for being a female, *TERTIARY* for the completed tertiary education, level 2 error term  $u_{0j}$  and error term  $r_{ij}$ .

Table 1: Final estimation of fixed effects (with robust standard errors)

Fixed Effect	Coefficient	Standard error	t-ratio	p-value
INTRCPT, $\gamma_{00}$	2.21	0.11	19.86	<0.001

HDI, $\gamma_{01}$	1.62	0.63	2.57	0.019
IMAG_CH, $\gamma_{10}$	0.24	0.07	3.59	<0.001
IMAG, $\gamma_{20}$	-0.16	0.05	-3.17	0.002
PETITION, $\gamma_{30}$	-0.01	0.02	-0.33	0.740
SCIENCE, $\gamma_{40}$	-0.01	0.01	-1.22	0.223
AUTONOM, $\gamma_{50}$	0.05	0.03	1.73	0.084
INCOME, $\gamma_{60}$	-0.03	0.01	-2.12	0.034
AGE, $\gamma_{70}$	0.00	0.00	3.15	0.002
FEMALE, $\gamma_{80}$	0.01	0.07	0.16	0.876
TERTIARY, $\gamma_{90}$	-0.19	0.06	-3.32	<0.001

df1=18, df2=4719

While controlling for the effects of gender, age, income and education as well as other individual characteristics, the independent positive effect of HDI on individual innovative and creative potential was confirmed as showed in Table 1.

According to such results we conclude that HDI contributes to the innovative performance of the individuals. Thus we can accept the first hypothesis claiming that being prone to innovations is influenced by specific social embeddedness of personalities at the individual level and also at the national level – the more is individual endowed with particular resources, more is prone to innovations, and more those resources are present on a national level in general, their presence influences the outcome.

It may see counter intuitive at first glance, but tertiary education does not encourage individuals thinking with their own head, neither being creative or innovative. The effect of tertiary education on innovation potential is thus strong, negative and statistically significant. This been said we need to reject the second hypothesis, claiming that within people with tertiary education it plays an important role ‘being innovative or creative’.

Apart from accepting and rejecting the hypothesis we can also test the effect of other variables that has an impact on ‘being innovative or creative’. Here we detected a significant effect of post-modern values as well as having an active imagination on innovative and creative characteristics of the individuals. Imagination as an important child quality has a positive and statistically significant impact on ‘being innovative or creative’, negative statistically significant effect is detected for people who perceive themselves as having active imagination. From the analysis we can also detect that individual’s autonomy has a statistically non-significant effect on ‘being innovative or creative’, same is true for world is worse off, because of science. Even gender does not have a statistically significant impact on individual innovation and creativeness potential, while self-assessed income scale has a negative effect on individual innovation and creativeness [25].

Before importing to data to HLM 7 software we recoded the missing values to a common (period) code in IBM SPSS 21.0, so that HLM modules are able to understand the missing values correctly. Residual analysis (model fit and distributional assumptions) of the models were computed on residual level – 1 and level – 2 files showed satisfactory results [13].

## 4 Conclusion

Innovations seem to be one of the most popular concepts nowadays. It has become a sort of a buzz word in political and economic developmental strategies and money allocations, public discourses and scholarly endeavors, as one can notice a flood

of publications on a topic Innovations of different kinds have been a vehicle of developmental processes since the cognitive revolution of our human species, dated back in approximately 40.000 years, but their role have accelerated in the last couple of hundred years and it is still increasing. Innovations have been addressed from different angles contributing to the extensive knowledge we have nowadays, but there are still missing puzzles in considering the tremendous role of innovations for our society in recent times. There are macro structural features of particular social environments facilitating or hindering those factors, which can sketch boundaries of particular regions, national societies, or global areas expressing higher or lower levels of innovative performances. However, there is also a mezzo and micro level, which one should take into account when considering innovations. Conceptualizing of how innovative society can be observed at the level of individuals, predicting it is highly related to ability of taking risks and being creative, one can notice the latter contributes to a better adaptation to the new structural order. In that regard, it is important to elucidate the interplay between social structural forces and cognitive settings of individual contributing to the innovative societies.

The important role in creating innovative society has been attached to HEIs as they are combining different actors in triple-helix constellations. But there is a significant hindrance in the innovative society induced by HEIs, where innovations are considered from the semantic meanings of individuals. Tertiary education significantly obstructs someone’s openness to new ideas and being creative. Cognitive mobilization and formal education help someone to adapt on the social context, but certain level of creativity seems to get lost. Each person has her or his own private space and deploys internal conversation [11], which can lead to reflexive deliberations, but there are some conditions influencing whether one can evaluate the situation in which she or he is embedded as being an enablement or constraint acting as potential trigger to individuals’ mental emergent properties. Structural embeddedness confirmed to play a significant role in that regard. Also developmental performances of the country influence the emergence of the innovative and creative society. However, being innovative and to think up new ideas also means to be able to resist certain structural influences and cognitive frameworks. The successful developmental performances thus depend on structural settings and

high level of general development. But it also needs dauntless, spirited and reflexive individuals.

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