STUDENTS' EVOLVING ENTREPRENEURIAL BEHAVIOR IN POST-SOCIALIST AND MARKET-ORIENTED ECONOMIES

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ABSTRACT

This paper theorizes how diverse institutional conditions influence students' entrepreneurial behavior. We tested our hypotheses on a sample of 91,105 students from 557 universities located in nine post-socialist economies and nine market-oriented economies in Europe. The results show interesting trends in the influence of institutional conditions on students' entrepreneurial behavior at the country and university levels. More concretely, national culture and university environment are found to be crucial for students becoming "nascent entrepreneurs" in post-socialist countries. Several implications for policy markers emerge from this study.

Keywords:

Entrepreneurial behavior; post-socialist economies; institutions; university environment

JEL codes

L26, I25, P3

1. INTRODUCTION

Various attributes of entrepreneurial behavior are widely recognized as important factors contributing to job creation, increasing welfare, and facilitating socio-economic development in different institutional environments (Wennekers & Thurik, 1999; Manolova et al., 2008). In developed innovation-driven economies, entrepreneurial activity promotes the capacity to innovate new-to-market products and services at the technology frontier (Marozau et al., 2016; Guerrero & Urbano, 2017). In post-socialist economies, entrepreneurship has been playing an enormous role in transitioning to the free market, absorbing human resources from traditional sectors, and bringing foreign investments and technologies to a country (Estrin et al., 2006; Welter & Smallbone, 2011).

In this regard, policymakers, researchers, and business leaders around the globe have shown a growing interest in the interplay of context and entrepreneurship development (Welter et al., 2016). This fact could explain why several projects that analyze the entrepreneurship phenomenon have incorporated many institutional factors (examples include Doing Business, Global Entrepreneurship Monitor, Kaufman Foundation, Panel Study of Entrepreneurial Dynamics, and Global University Entrepreneurial Spirit Students' Survey). Some informal institutional factors (culture, traditions, values, and attitudes) are less susceptible to transformation by public intervention because they take generations to change (North, 1990; McKeever et al., 2015).

Entrepreneurship is a multilevel phenomenon that is embedded in particular places, communities, and organizations (including universities) that each represent specific institutional environments (Liao & Welsch, 2005; McKeever et al., 2015). Consequently, the diversity of contexts explains cross-organizational, cross-regional and cross-national differences in the levels, forms, and effects of the entrepreneurial activities (Suddle et al., 2010). In this vein, in the democratization of the higher education era, the university context could foster the emergence of students' entrepreneurial behavior through instilling relevant values, attitudes, and self-confidence (Bergmann et al., 2016). This is directly related to universities' more general innovative and entrepreneurial orientation, which both supports the university community and generates value in society (Guerrero et al., 2014; Guerrero & Urbano, 2019).

In parallel, students' entrepreneurial behavior is influenced by the institutional conditions related to entrepreneurship observed at the country level in post-socialist or market-oriented economies (Manolova et al., 2008; Guerrero et al., 2017; Guerrero & Urbano, 2019). Since the 1990s, universities are still influenced by generational values that have persisted despite the institutional transformation towards a market-oriented economy (Weiss et al., 2019; Bogatyreva et al., 2019).

The inherited institutional context of European post-socialist economies on both national and university levels still contrasts with that existing in the developed market-oriented economies which have a long tradition of free entrepreneurship, market competition, and well-developed legislation (Manolova et al., 2008; Guerrero et al., 2017). In this regard, since the 1990s, the transition to a free market-oriented economy has required substantial institutional transformations that are not completed but create an interesting entrepreneurial landscape (McKiernan & Purg, 2013). In this regard, following calls for further research on the effects of institutional factors using a multilevel perspective (Hayton et al., 2002; Weiss et al., 2019; Li, 2020), this paper theorizes how diverse institutional contexts influence students' entrepreneurial behavior. We tested some hypotheses on a sample of 557 universities located in nine post-socialist economies and nine market-oriented economies in Europe. The results show interesting trends in the influence of institutional conditions and students' entrepreneurial behavior at the country, university, and individual levels. More concretely, national culture and university values have been challenging conditions for those students who become entrepreneurs in post-socialist countries. Similarly, the role of the university environment in supporting students' entrepreneurial behavior appears more decisive in this group of countries. Considering post-socialist countries only, we demonstrate that universities established in the post-socialist era are no more supportive of students' entrepreneurial behavior than traditional public universities.

The paper is structured as follows: the next section sets out the theoretical foundations and hypotheses to be tested; Section 3 describes the methodological design to test the hypotheses; Section 4 shows the results and discussion; and the last section describes the conclusions, implications, and future research avenues.

2. THEORY DEVELOPMENT

2.1 Theoretical foundations

A growing number of published papers have recognized the crucial role between context and entrepreneurship (Van Stel et al., 2007; Guerrero et al., 2020). Usually, the context has been understood and measured through formal and informal conditions that define the rules of the game and shape interactions among individuals, groups, and organizations (North, 1990). According to North (1990), formal institutions are related to the legal system, including property rights and procedures to reduce transaction costs and make markets more efficient, while informal institutions stem from culture, values, beliefs, and norms. Arguably, institutions may act as constraining or enabling forces (Aidis et al., 2008; Welter & Smallbone, 2011), both delegitimizing and legitimizing entrepreneurial activity as an attractive or socially-valued career choice (Li, 2020). A favorable institutional environment that stimulates individuals to become entrepreneurs is characterized by formal conditions (supportive regulations, supportive programs, simple procedures, simple taxation) and informal ones (culture, values) that foster entrepreneurship (De Clercq et al., 2010; Fayolle et al., 2014; Ani, 2015; Guerrero et al., 2020). In contrast, collectivist or high uncertainty avoidance orientations constrain the emergence of entrepreneurial initiatives in society (Autio et al., 2013). Assuming these propositions are correct, the context could either enhance or constrain human behavior, decisions, and actions (McKeever et al., 2015; Bergmann et al., 2016). Especially important are the social values inherent in families (Zellweger et al., 2011), organizations (Benitez-Amado et al., 2010), universities (Weiss et al., 2019), regional actors (Liñán et al., 2011), and society at large (Autio et al., 2013). In this regard, we theorize the influence of institutional conditions at the country and the university level.

2.2 Hypotheses

At the country level, the dominant economic orientation configures the formal and informal institutions. Within the socialist orientation that, for more than four or seven decades, dominated in eastern and central European countries, institutions have constrained entrepreneurship (Alas & Rees, 2006). The ideology of the socialist era considered entrepreneurship as something extraneous and illegal, and the ideology has left an imprint on the transition period (Aidis et al., 2008). Centralized and planned socialist

economies suppressed individualism, risk-taking behavior, and did not provide sufficient individual stimuli (Ellman, 2014). This context sharply contrasts with that existing in the developed market-oriented economies which have long traditions of free entrepreneurship, market competition, and well-developed legislation (Manolova et al., 2008). Meanwhile, some studies of post-socialist countries have documented the gradual change in culture, values, and attitudes towards free-market entrepreneurship, especially in those countries that acceded to the European Union (Kshetri, 2009; Welter & Smallbone, 2011).

During the transition stage towards a market-oriented economy, nascent entrepreneurs often operated in the black or illegal markets in the face of institutional uncertainty (Aidis et al., 2008). Indeed, during the transition phase, the younger generations maintain individualist values and uncertainty avoidance behavior (Aidis et al., 2008; Stenholm et al., 2013; Ellman, 2014). In contrast, market-oriented economies developed regulations supporting competition and entrepreneurship (Manolova et al., 2008). Empirical studies have found the negative influence of certain features of socialist institutions (e.g., strict economic planning or values) on entrepreneurial behavior (Carbonara et al., 2016; Krasniqi and Desai, 2016; Bogatyreva et al., 2019). At the same time, a considerable number of studies have found conclusive evidence of a negative relationship between entrepreneurial behavior and such features of socialist institutions as strict economic planning (Carbonara et al., 2016) and collectivism (Pinillos and Reyes, 2011; Bogatyreva et al., 2019). Meanwhile, the requirements of, and sensitivity to, the institutional environment are argued to be higher in less-developed countries including post-socialist economies than in the stable business contexts of developed countries; this is attributed to pre-existing culture, values, corruption, and the incomplete development of regulations (Aidis et al., 2008; Welter & Smallbone, 2011; Stenholm et al., 2013). In the same vein, in post-socialist economies, informal institutional factors such as changes in culture, values, and attitudes, are powerful in conditioning entrepreneurial behavior (Krasniqi & Desai, 2016).

Based on this assumption, the pre-existence of informal conditions (social values, corruption, and regulations still under development) observed in post-socialist economies represents critical constraints

for the current young generations of students interested in becoming entrepreneurs. In this regard, we hypothesize that:

> *H1. Country institutional conditions play a more negative role in students' likelihood of being entrepreneurs in a post-socialist economy than for students in a market-oriented economy*

At the university level, as students and faculty are embedded in a university context, the university environment could be more influential than the country environment (Varblane & Mets, 2010; Bergmann et al., 2016). Even universities in one country are multifarious in terms of scopes, strategies, culture, educational and research profiles – that is, in their combinations of formal and informal institutional factors (Linan et al., 2011; Politis et al., 2012; Guerrero et al., 2014) – and thereby create unique contexts that either encourage or constrain entrepreneurial behavior within the university community (Lüthje & Franke, 2003; Guerrero and Urbano, 2012). Indeed, previous empirical studies have shown the influence of university institutional conditions on students' entrepreneurial behavior (Liñán et al., 2011; Guerrero and Urbano, 2012; Guerrero et al., 2014). In several post-socialist economies, universities belong to higher education systems that have undergone an institutional transformation of values, missions, and regulations (Marozau et al., 2019). Universities have transformed themselves to meet demands from the local private sector through entrepreneurship education (Saginova & Belyansky, 2008). However, the generation and transfer of knowledge, one of the key components of entrepreneurship, have been underdeveloped given macro-institutional conditions that have reduced universities' discovery and exploitation processes (De Clercq et al., 2010). An important role in these processes was played by international projects funded by USAID and EU programs (e.g., Alfa, Edu-link, Tempus, Erasmus) which supported the modernization and internationalization of higher education and provided Western institutions as role models (Froumin & Smolentseva, 2014; Ellermann, 2017). Thus, universities have become one of the key transmitters of knowledge and key institutions in entrepreneurship development (Guerrero & Urbano, 2017) from the Western world to post-socialist countries. Moreover, extensive social ties and access to the knowledge

acquired at universities may compensate a comparatively underdeveloped country institutional environment and positively influence opportunity discovery and exploitation (Manev et al., 2005; De Clercq et al., 2010). Based on these assumptions, universities in post-socialist economies could reduce the constraints of national institutions on the configuration of students' entrepreneurial behavior. This effect could be highest when the university was established post-1991 (Kwiek, 2012; Varblane & Mets, 2010; Marozau & Guerrero, 2016). In this regard, we hypothesize that:

H2a. University institutional contexts play a more positive role in students' likelihood of being entrepreneurs in a post-socialist economy than for those students in a market-oriented economy

The turbulent transition period of the early 1990s, characterized by the fading out of old regulations and the inchoate development of new ones, gave rise to many new higher education institutions (Varblane & Mets, 2010) founded as entrepreneurial organizations by proactive leaders. These post-1991 institutions focused mainly on mass consumption teaching services in fields that were new in the context such as business, management, economics, and social sciences (Kwiek, 2012). As a result, entrepreneurship education has been better developed in the more flexible private higher education institutions, in local campuses of Western universities, and in business-oriented public schools that were separated from public universities in the 1990s and have managed to create a relatively supportive environment for entrepreneurship (Varblane & Mets, 2010; Marozau et al., 2019).

H2b. University institutional contexts play a more positive role in students' likelihood of being entrepreneurs in universities established in the post-socialist era than for those students in universities established in the socialist era.

3. METHODOLOGY

3.1 Data collection

The data came from multiple sources of information. At the individual level, data came from the 2016 and 2018 Global University Entrepreneurial Spirit Students' Survey (GUESSS). Our sample was constructed in several steps. Initially, we selected the 18 European countries that participated in GUESSS in 2016 and 2018 as well as in the European Values Survey (EVS) in 2017. As a second step, we sifted the data to include only bachelor students under 30 years old. This was expected to make samples from different countries more comparable, taking into account discrepancies in the mandates and content of master's and postgraduate programs, especially in post-Soviet countries (e.g., Russia and Belarus). Next, survey responses from exchange students were excluded since their opinions could refer to either host or home university, yet they were assigned to the host university and its country's location (Shirokova et al., 2016). We then excluded respondents from unknown universities because of the inability to identify their rankings and age from secondary sources. Finally, we excluded survey responses with missing values for any item among the dependent and independent variables. The data set was complemented with university-level data obtained from QS World University Rankings and universities' websites. In addition, we benefitted from EVS and World Bank data and to capture cross-country differences. The sample included 91,105 students enrolled in 557 universities in nine market-oriented economies, and nine post-socialist economies (see Table 1). At the university level, data were obtained from the 2016 and 2018 GUESSS surveys and the 2018 QS World University Rankings. At the country level, data were from the 2017 European Value Survey, the 2016 and 2018 Doing Business reports, and the World Bank.

--- Insert Table 1 here ---

3.2 Measures

Dependent variables: Each student's entrepreneurial behavior was measured using two binary variables from the 2016 and 2018 GUESSS surveys (Shirokova et al., 2016; Weiss et al., 2019). First, the *nascent entrepreneurs* variable was given the value one if the student was trying to start a business at the survey time. Second, the *active entrepreneurs* variable was coded one if the student was running a business at the survey time. As we discussed above, the entrepreneurial behavior of students is affected by factors

corresponding to three levels. Respectively, the independent and control variables used in the analysis represent different characteristics relevant at the country, university, and individual levels (see Table 2).

Independent variables: At the country level, we used various variables from the 2017 European Values Survey and the 2016/2018 Doing Business index. Informal country institutions were measured using two Likert scale variables related to equalizing incomes and competition (Autio et al., 2013). First, the *equalizing of incomes perception* variable takes the value ten where the population's perception was that income should be made equal or value 1 when popular perception was that greater incentives based on individual efforts should be in place. Second, the *competition perception* variable takes the value 10 when the population's perception was that competition is harmful because it brings out the worst in people, or value one when the competition is perceived as good because it stimulates new ideas and value. Formal country institutions were measured using three variables (Van Stel et al., 2007): the *procedures* variable captures the number of procedures necessary to start a business, the *credits* variable captures the score for getting credit, and the *taxes* variable captures the score of paying taxes. At the university level, we used variables from the 2016/2018 GUESSS survey. Informal university conditions were captured by the *supportive environment* variable representing a factor analysis of the 7 Likert Scale students' perceptions about how the university atmosphere influences the development of new business ideas, becoming an entrepreneur, and engaging in entrepreneurial initiatives (Sieger et al., 2014). Formal university conditions were captured by the *entrepreneurship education* variable that takes value one if the student enrolled in one entrepreneurship course.

Control variables: At the country level, we controlled using the natural logarithm of GDP per capita PPP (current international $) in 2018 (*LnGDP*), which has a U-shape relationship with entrepreneurial activity (Wennekers et al., 2005). At the country university level, we controlled the university quality measured from the 2018 QS World University Rankings, as well as the fields of study from Business & Economics and Engineering & IT. At the individual level, we controlled using the student's demographic characteristics available in GUESSS, such as family entrepreneurial background, gender, and the age of respondents (Dohse & Walter, 2012).

--- Insert Table 2 here ---

3.3 Model

A multilevel logistic regression model was estimated to (1) predict the probability of the decision to become a nascent entrepreneur (trying to start a business) depending on the institutional conditions, and (2) predict the probability of the decision to become an entrepreneur (run a business) depending on the institutional conditions. The adequacy of using multilevel models was confirmed by calculating the intraclass correlation coefficient (ICC) for a three-level nested model. While ranging from 0 to 1, ICC equal to 0 indicates that observations do not depend on a country and university they are nested in. If the ICC is not different from zero or negligible, one-level regression analysis can be used. Based on this criterion, the application of multilevel analysis instead of an ordinary single-level regression was justified.

Two sets of multilevel logistic regression models were estimated: (1) predicting the probability of being a nascent entrepreneur, i.e., undertaking activities to start a business in the near future; (2) predicting the probability of being an entrepreneur. The models have a hierarchical structure with three levels: *i* individuals are nested in *j* universities that are nested in *k* countries (*c*). Similarly to Bergmann et al. (2016), the formal model appears as follows:

$$\ln \frac{P(Y_{i\,j\,k}=1)}{1-P(Y_{i\,j\,k}=1)} = \left(B^{000} + B^{100}S_{i\,j\,k} + B^{010}U_{j\,k} + B^{001}C_k\right) + (e_{i\,j\,k} + u_{j\,k} + r_k);$$

Where:

$\ln \frac{P(Y_{i\,j\,k}=1)}{1-P(Y_{i\,j\,k}=1)}$ – a likelihood ratio of being nascent/active entrepreneur;

B^{000} – intercept;

$S_{i\,j\,k}$ – individual-level independent and control variables;

$U_{j\,k}$ – university-level independent and control variables;

C_k – country-level independent and control variables;

$e_{i\,j\,k}$, $u_{j\,k}$, r_k – error terms of the individual-, university-, country-level respectively.

Models were compared using AIC and BIC information criteria – models for which AIC and BIC are smaller better fit the data. Multicollinearity issues can be ruled out because the highest value of the correlation coefficients is -0.578 (observed between the country-level variables *Competition* and *Credits*), while institutional environment factors are usually highly correlated with each other (Krasniqi & Desai, 2016). A comparatively large number of observations enabled the use of sub-samples instead of including interaction terms. Thus, for each dependent variable, the model was estimated on: (1) the entire sample; (2) a sub-sample comprising transition economies; (3) a sub-sample comprising developed economies; (4) a sub-sample comprising universities from post-socialist economies established before 1991; and (5) a sub-sample comprising universities from post-socialist economies established after 1991 (Table 3).

--- Insert Table 3 here ---

4. RESULTS AND DISCUSSION

Tables 4 and 5 show the results of our multilevel logistic regression analysis for nascent entrepreneurs and active entrepreneurs, respectively.

--- Insert Table 4 and Table 5 here ---

At the initial stage of the analysis, we estimated the null model without any independent or control variables in order to assess the percentage of overall variance explained by differences among countries and universities for both independent variables (based on intraclass correlation coefficients). Thus, for potential entrepreneurs, the country and university context accounted for 7.2 and 11.4 percent of the variance, respectively. For active entrepreneurs, these figures were lower – 6.4 and 9.2 percent, respectively. This means that, in general, the university context appears more important than the country context for both types of student entrepreneurial behavior, while the largest share of variance can be attributed to the individual level.

At the country level, focusing on informal conditions, our results show a negative influence of equalizing incomes (*Equalizing of incomes perception*) on nascent entrepreneurs in the entire sample (M1b) and post-socialist economies separately (M1c). In contrast, where the population's perception favors equalizing incomes, this positively effects the likelihood of students becoming active entrepreneurs in post-socialist countries (M2c) but is nonsignificant in market-oriented economies (M2d). Indeed, the population's negative perception of competition negatively effects on students becoming active entrepreneurs in market-oriented economies (M2d) but is nonsignificant in post-socialist countries (M2c). Intuitively, this issue should demand reinforcement of the pro-entrepreneurial culture and values in young generations in post-socialist economies. Concerning formal conditions, their influence on students' entrepreneurial behavior differs according to the entrepreneurial stage and type of economy. First, the student's likelihood of being a nascent entrepreneur is positively influenced by getting access to credits and a number of procedures to start a business (M1b). Second, the student's likelihood of becoming a nascent or active entrepreneur is negatively influenced by getting access to credits in market-oriented economies (M1d, M2d). Third, the student's likelihood of being an active entrepreneur is positively influenced by a better taxation system in post-socialist economies (M2c). In general, these results support H1.

At the university level, focusing on informal conditions, the perception of a supportive university environment positively influenced the students' likelihood of being nascent entrepreneurs in post-socialist economies (M1c). However, this effect is negative in the case of active entrepreneurs in post-socialist economies (M2c). A plausible explanation is that a positive perception reinforces students' entrepreneurial intentions, and then it changes to a negative one when they become active entrepreneurs because of their critical perception or identification of weaknesses in the university environment during their entrepreneurial activities. For example, the origins of an idea and the resources to start a business might not be related in any way to a university. Concerning the formal conditions, entrepreneurship education is positively related to the students' likelihood of being both nascent and active entrepreneurs in both post-socialist (M1c, M2c) and market-oriented economies (M1d, M2d) (Zhang et al., 2014; Shirokova et al., 2016). Our results support H2a. Indeed, the observed effects of the university

institutional conditions are consistent in students enrolled in universities established pre/post-1991. However, results show an exception regarding the statistically insignificant effect of entrepreneurship education on the students' likelihood of being active entrepreneurs enrolled in universities established before 1991 (M2e). At these universities, a higher quality of education and a more favorable environment have a negative and statistically significant impact. Studying at these universities may demand more effort from students and this may dissuade them from entrepreneurial activities during their study since entrepreneurial activities are time-consuming as well. A more favorable entrepreneurial environment at such universities may provide multiple opportunities for generating and testing ideas, networking, and trying one's hand in business. In contrast, it does not necessarily promote immediate willingness to run a real business (Weiss et al., 2019). The parameter differences between groups demonstrate that students from post-1991 universities are more likely to start a business than their peers from pre-1991 universities. We also observe a negative influence on nascent students' entrepreneurial behavior when they are enrolled in Engineering & IT at pre-1991 universities (M1e), while a positive influence on nascent students' entrepreneurial behavior when they are enrolled in business/economics/management at post-1991 universities (M1f) (see Varblane & Mets, 2010). Our results support H2b. We may deduce that exposure to entrepreneurship education rather than business-related study fields are significant predictors regardless of the university and country context confirming its role in the development of the entrepreneurship capital (Audretsch & Keilbach, 2004).

Robustness check

We tested our results for robustness by running one-level logistic regression models (M1b and M2b) and by calculating post-estimated predictive margins with 95% confidence intervals for both dependent variables and key independent variables (see Annex 1). The predictive margins enabled us to visualize and confirm the differences between post-socialist and market-oriented economies as well as between pre-1991 and post-1991 universities in terms of students' nascent and active entrepreneurship. For example, in post-socialist economies, we may observe a higher probability of being a nascent entrepreneur but a lower probability of being an active entrepreneur. Additionally, the results illustrate that students' involvement in various stages of entrepreneurial activities (nascent/active) is influenced

by various institutional factors that, counterintuitively, may have opposite effects (*Supportive environment, Equalizing of incomes perception, Competition perception*).

5. CONCLUSIONS

This study contributes to the entrepreneurship literature by extending two academic debates. First, we consider the influence of country and university context (informal and formal conditions) on students' entrepreneurial behavior (nascent and active entrepreneurs). According to Welter et al. (2016), it is crucial to understand the relevance of contextualizing contexts to understand entrepreneurial diversity better. Second, we emphasize the crucial role of universities as a catalyst of entrepreneurship in economies where the institutional conditions are still under development (post-socialist economies). According to Guerrero and Urbano (2019), universities must play a crucial role in fostering entrepreneurship and innovation in transition and emerging economies to respond to institutional voids and societal needs. The new mandate of universities is relevant regardless of their age, profile, reputation, and traditions and may increase attractiveness to new talent (students, faculty members, managers, and entrepreneurs) (Wong et al., 2007). This study is the first empirical attempt to explore and combine country and university-level factors with a specific focus on post-socialist economies to the best of our knowledge.

We acknowledge some limitations that suggest avenues for future research. The key one is related to our metrics of institutional conditions. Although several studies have implemented similar metrics at the country level (Krasniqi & Desai, 2016), the university level proxies of culture, values, and norms could be improved (McKeever et al., 2015; Li, 2020). The lack of open-access information about universities' institutional conditions in post-socialist economies has limited the analysis and relied on proxies such as pre-1991 vs. post-1991. Second, we provided theory-based proxies for country institutional environment relevant for comparisons of post-socialist and developed economies, acknowledging other possible operationalizations of formal and, especially, informal factors (Busenitz et al., 2000; Bogatyreva et al., 2019). Future research might explore other combinations of country-level institutional factors considering endogeneity and reverse causality issues (Carbonara et al., 2016). Third, our analysis

employed individual-level variables based on self-reported measures. This gives rise to the self-selection bias that is inherent in most studies on entrepreneurial behavior, particularly among students who were not randomly selected (Bogatyreva et al., 2019). The research would benefit from measures of students' prior professional and entrepreneurial experience, which could increase their ability to explore and exploit viable business ideas and start a venture (Morris et al., 2017). Finally, we are conscious that in some comparatively large and heterogeneous countries, formal and informal factors may vary across regions (Liñán et al., 2011; Weiss et al., 2019). In this regard, the WVS and EVS should be considered by scholars as rich data sources for future research on the topic. In the same vein, assessment of interaction effects among formal and informal institutional factors at the university, region, and country level could be a promising research opportunity. Another possible research line could explore factors influencing students' impactful, research-based and opportunity-driven entrepreneurial activities that contribute to economic growth (Hechavarria & Reynolds, 2009; Urbano et al., 2017).

Our study provides relevant insights and implications *for policymakers* regarding the critical role of context and support for university initiatives in fostering entrepreneurship. A sound entrepreneurship development policy should go far beyond formal measures assessed and encompass culture, values, and norms endemic to a country as a whole and particular places and organizations such as universities (Liao & Welsch, 2005; McKeever et al., 2015; Li, 2020). In the same vein, *for university managers*, while most university efforts are concentrated on formal measures (such as educational programs, support infrastructure, and incentive systems), the crucial role of creating a favorable informal environment (such as university culture, support for leadership and risk-taking behavior, and role models) that foster students' entrepreneurial behavior should be legitimized (Guerrero & Urbano, 2012). *For entrepreneurship educators*, even though students may not start a business immediately after completing their studies, entrepreneurial competencies and experiences acquired during their studies may lead to start-up creation at a later stage in their careers (Bergmann et al., 2016). The context-specific entrepreneurship courses (rather than programs) with more enterprising and action-oriented approaches and activities could stimulate students' interest and perceived self-efficacy to pursue this career path.

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Table 1. General characteristics of respondents

Country	Number of students	Number of universities	Type of economy
Austria	2397	46	Market-oriented
England	825	18	Market-oriented
Finland	287	22	Market-oriented
France	194	7	Market-oriented
Germany	14530	55	Market-oriented
Italy	6543	35	Market-oriented
Norway	35	8	Market-oriented
Spain	29856	75	Market-oriented
Switzerland	8709	71	Market-oriented
Belarus	836	18	Post-socialist
Czech Republic	1203	10	Post-socialist
Estonia	1073	25	Post-socialist
Hungary	9146	28	Post-socialist
Lithuania	1017	37	Post-socialist
Poland	4459	49	Post-socialist
Russian Federation	5347	31	Post-socialist
Slovakia	4007	16	Post-socialist
Slovenia	641	6	Post-socialist
Total	**91105**	**557**	

Source: Based on GUESSS (2016 and 2018)

Table 2. Description of variables

	# of valid values	# of missing values	Yes (1)	No (0)	mean	S.D.
Dependent variables						
Are you currently trying to start your own business / to become self-employed? (*Active*)	91105	0	14.5%	85.5%	0.15	0.352
Are you already running your own business / are you already self-employed? (*Potential*)	91105	0	3.7%	96.3%	0.04	0.189
Independent variables						
Institutional conditions at the country-level						
Incentives for individual efforts vs equalize incomes (*Equalizing of incomes perception*)	91105	0	-	-	4.4834	0.517
Competition good-harmful for people (*Competition perception*)	91105	0	-	-	3.9182	0.366
Number of procedures to start a business *(Procedures)*	91105	0	-	-	6.77	1.442
Getting credit score *(Credits)*	91105	0	-	-	64.43	8.449
Paying taxes score *(Taxes)*	91105	0	-	-	81.1234	5.834
Institutional conditions at the university-level						
Factor for university entrepreneurial environment *(Supportive environment)*	91105	0	-	-	0	1
Attendance of at least one course (*Entrepreneurship education*)	91105	0	33.2%	66.3%	0.3373	0.473
Control variables						
Country-level						
lnGDP	91105	0	-	-	10.5431	0.287
University level						
University score in the QS Ranking (*University quality*)	91105	0	-	-	5.0066	13.135
Engineering & IT specialization *(IT studies)*	91105	0	23.6%	76.4%	0.236	0.425
Business & Economics specialization (*Business studies*)	91105	0	38.8%	61.2%	0.3878	0.487
Individual-level						
Factor for reaction of family/friends/peers on being an entrepreneur *(Social reaction)*	89880	1225[(a)]	-	-	0	1
At least one parent self-employed (*Entrepreneurial parents*)	91105	0	31.1%	68.9%	0.31	0.463
Age in the year of survey (*Age*)	91105	0	-	-	21.700	2.436
Gender (0- male, 1 -female) (*Gender*)	91105	0	Male 39.1%	Female 60.9%	0.61	0.488
Year of survey (0- 2016, 1 -2018) (*Year of the survey*)	91105	0	2016 38.3	2018 61.7	0.62	0.486

Note: [(a)] In 2016, students who were running a business did not answer this question

Table 3. Description of sub-samples

Dependent variable	N	Countries	N	Universities	N
Are you currently trying to start your own business / to become self-employed? (*Active*)	87,717[(a)]	Post-socialist economies	26,433	established before 1991 (*Pre-1991*)	19,597
				established after 1991 *(Post-1991)*	6,836
		Market-oriented economies	61,284	n/a	n/a
Are you already running your own business / are you already self-employed? (*Potential*)	91,105	Post-socialist economies	27,729	established before 1991 (*Pre-1991*)	20,537
				established after 1991 *(Post-1991)*	7,192
		Market-oriented economies	63,376	n/a	n/a

Note: [(a)] This number of observations does not include students who were running a business at the moment of the survey

Table 4. Regression results for nascent entrepreneurs

Nascent entrepreneurs	All economies		Post-socialist economies	Market-oriented economies	Post-socialist economies	
	M1a	M1b	M1c	M1d	M1e Pre-1991	M1d Post-1991
Institutional conditions at the country-level						
Equalizing of incomes perception (IF)		-.528***	-.460**	-.398	-.437***	-.503***
Competition perception (IF)		.141	.162	-.322	-.101	.150
Procedures (FF)		-.007	.015***	-.014	.017**	.017*
Credits (FF)		.064	.071**	-.132***	.087**	-.019
Taxes (FF)		.028**	-.011	.018	-.003	-.037*
Institutional conditions at the university-level						
Supportive environment (IF)		.071***	.117***	.030	.120***	.106***
Entrepreneurship education (FF)		.506***	.339***	.627***	.351***	.302***
Control variables						
Country-level						
lnGDP	-1.579***	-1.429***	-.671*	-1.532***	-.907**	-.653
University-level						
University quality		.001	-.001	.002	-.000	-.006
IT studies	-.116***	-.169***	-.173***	-.158***	-.226***	-.085
Business studies	.089***	-.036	-.010	-.067	-.086	.235**
Individual-level						
Social reaction		.206***	.268***	.157***	.275***	.248***
Entrepreneurial parents		.407***	.469***	.362***	.445***	.540***
Age	.041***	.040***	.027**	.043***	.033**	.009
Gender (female)	-.768***	-.776***	-.732***	-.814***	-.771***	-.643***
Year of survey	.399***	.371***	.180***	.552***	.136***	.344***
Country-level variance	.040	.025	.001	.001	.001	.001
University-level variance	.073	.048	.015	.028	.016	.007
N	87,717	87,717	26,433	61,284	19,597	6,836
Wald chi2	1458.03	2736.64	1298.44	1834.03	921.02	410.43
Prob > chi2	.000	.000	.000	.000	.000	.000
LR test vs. logistic model:						
chi2(2)	1128.74	324.58	59.67	118.42	44.63	2.78
Prob > chi2	.000	.000	.000	.000	.000	.047
BIC	61259.30	59992.47	25265.39	34746.09	18191.11	7187.64

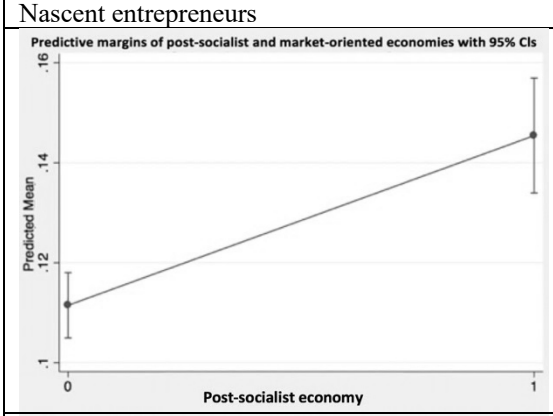
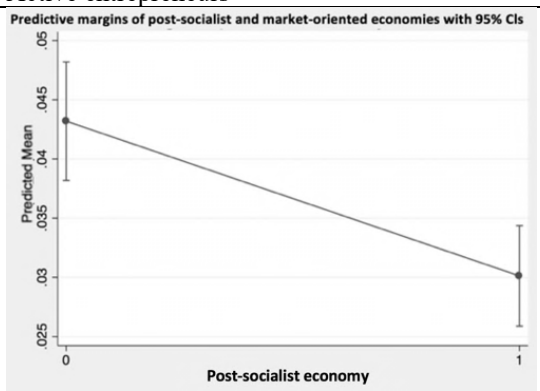
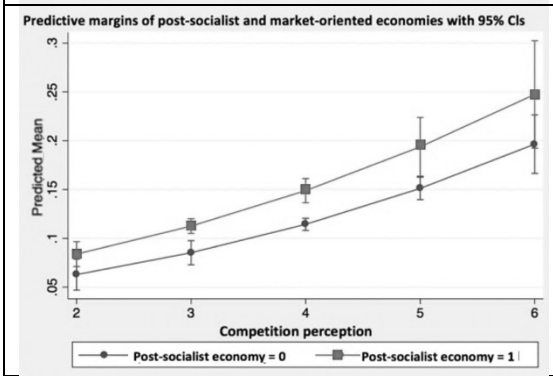
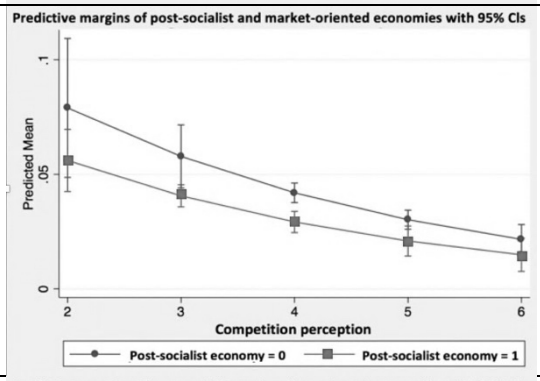
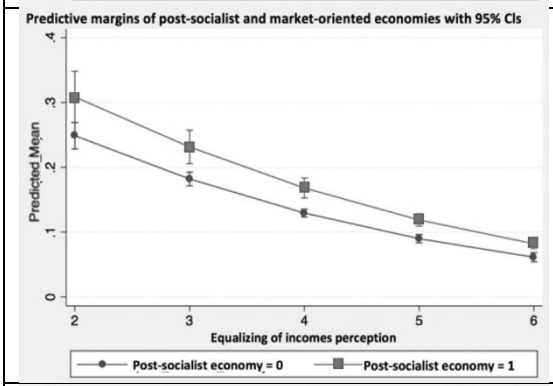
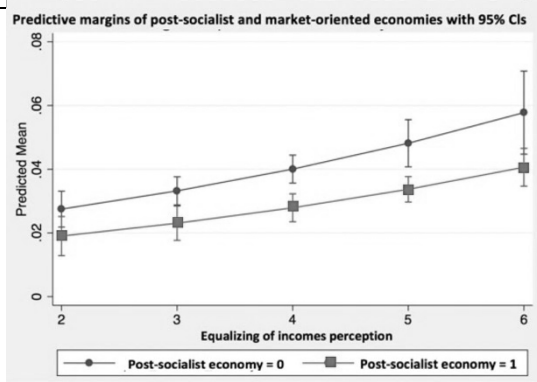
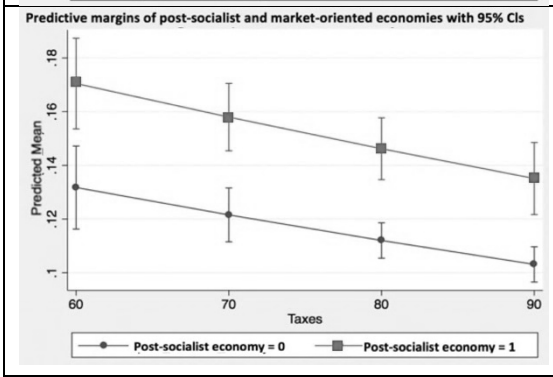
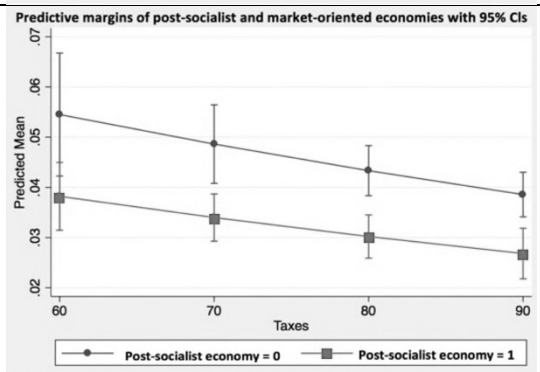
Note: IF= Informal factors; FF= Formal factors
*** Significant at the .001 level.
** Significant at the .01 level.
* Significant at the .05 level.

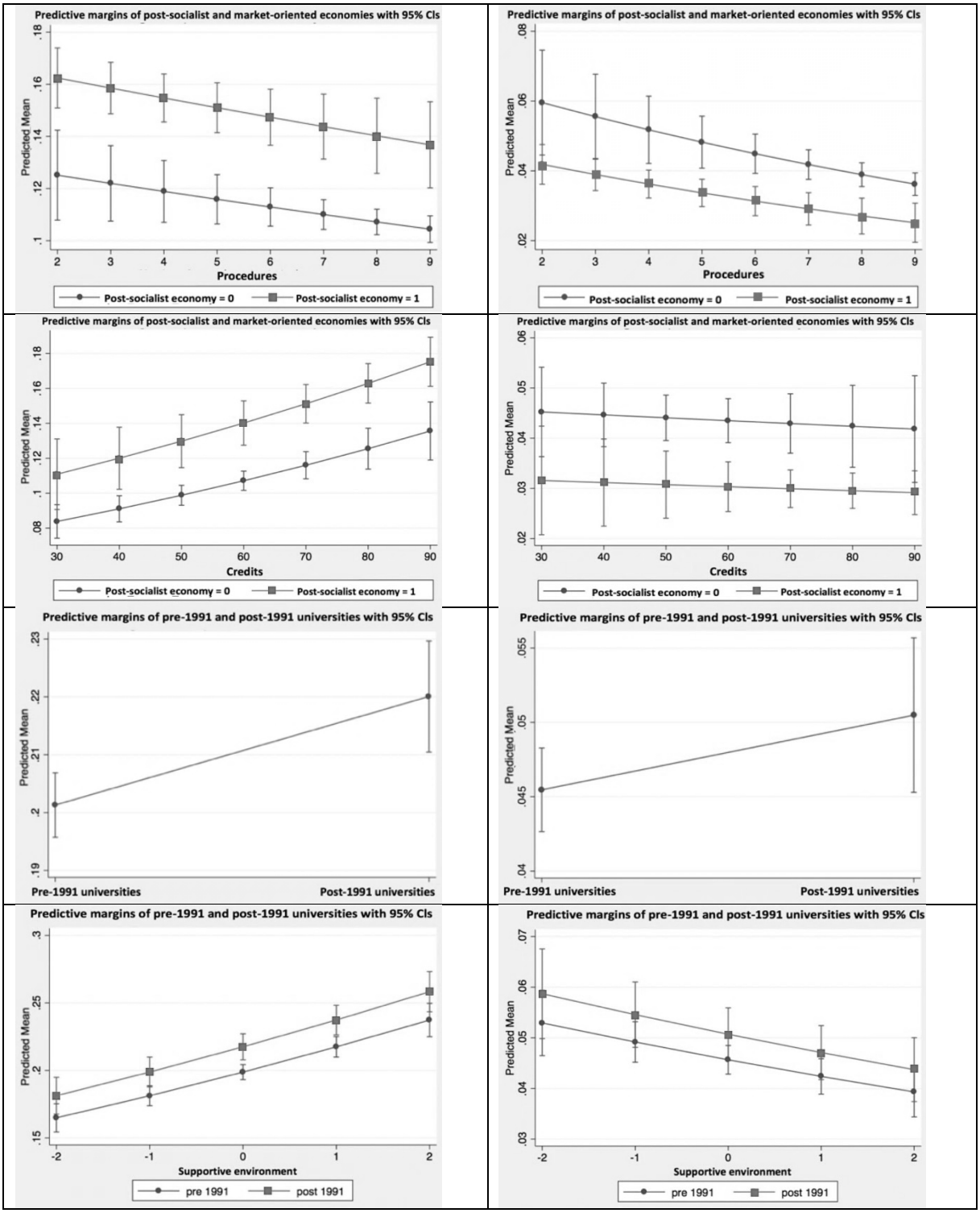
Table 5. Regression results for active entrepreneurs

Active entrepreneurs	All economies		Post-socialist economies	Market-oriented economies	Post-socialist economies	
	M2a	M2b	M2c	M2d	M2e Pre-1991	M2d Post-1991
Institutional conditions at the country-level						
Equalizing of incomes perception (IF)		.150	.461**	-.387	.523**	.538***
Competition perception (IF)		-.398	-.398	-1.116***	-.300	-.490
Procedures (FF)		-.013	.011	-.021	.010	.032*
Credits (FF)		-.050	-.026	-.165***	-.010	-.173
Taxes (FF)		.018	.058**	-.006	.071**	.044
Institutional conditions at the university-level						
Supportive environment (IF)		-.033	-.095**	-.002	-.123***	-.030
Entrepreneurship education (FF)		.453***	.357***	.506***	.406***	.182
Control variables						
Country-level						
lnGDP	-1.070**	-1.360**	-1.578	-2.270***	-3.093***	-2.429*
University level						
University quality		-.003	-.011*	-.001	-.015**	.009
IT studies	-.161**	-.183***	-.226*	-.155*	-.198	-.312
Business studies	.071	-.014	.147	-.081	.186*	.102
Individual-level						
Social reaction						-
Entrepreneurial parents		.829***	.926***	.775***	.917***	.957***
Age	.145***	.141***	.184***	.126***	.196***	.145***
Gender (female)	0.794***	-.770***	-.944***	-.668***	-.947***	-.934***
Year of survey	.232***	.242***	-.090	.395***	-.065	-.213
Specifications						
Country-level variance	.057	.064	.025	.001	.029	.001
University-level variance	.080	.092	.048	.015	.052	.022
N	91,105	91,105	27,729	63,376	20,537	7,192
Wald chi2	919.24	1563.22	725.41	1017.59	553.25	200.95
Prob > chi2	.000	.000	.000	.000	.000	.000
LR test vs. logistic model:						
chi2(2)	437.42	426.09	78.69	30.43	60.70	0.99
Prob > chi2	.000	.000	.000	.000	.000	.160
BIC	27600.22	27028.62	9689.84	17417.17	7075.22	2751.22

Note: IF= Informal factors; FF= Formal factors
*** Significant at the .001 level.
** Significant at the .01 level.
* Significant at the .05 level.

Annex 1. Robustness tests [Predictive margins]

Nascent entrepreneurs	Active entrepreneurs
	
	
	
	


Predictive margins of post-socialist and market-oriented economies with 95% CIs
Predicted Mean
Procedures
Post-socialist economy = 0
Post-socialist economy = 1
Predictive margins of post-socialist and market-oriented economies with 95% CIs
Predicted Mean
Procedures
Post-socialist economy = 0
Post-socialist economy = 1
Predictive margins of post-socialist and market-oriented economies with 95% CIs
Predicted Mean
Credits
Post-socialist economy = 0
Post-socialist economy = 1
Predictive margins of post-socialist and market-oriented economies with 95% CIs
Predicted Mean
Credits
Post-socialist economy = 0
Post-socialist economy = 1
Predictive margins of pre-1991 and post-1991 universities with 95% CIs
Predicted Mean
Pre-1991 universities
Post-1991 universities
Predictive margins of pre-1991 and post-1991 universities with 95% CIs
Predicted Mean
Pre-1991 universities
Post-1991 universities
Predictive margins of pre-1991 and post-1991 universities with 95% CIs
Predicted Mean
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pre 1991
post 1991
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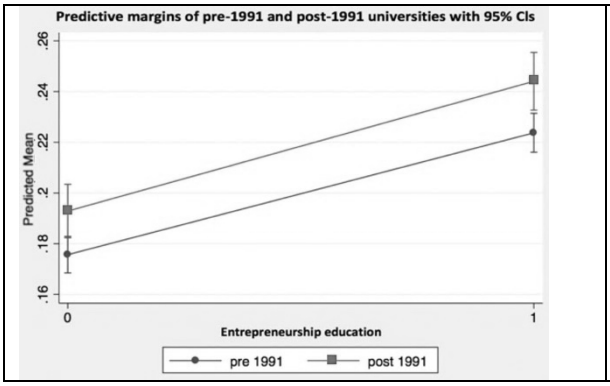
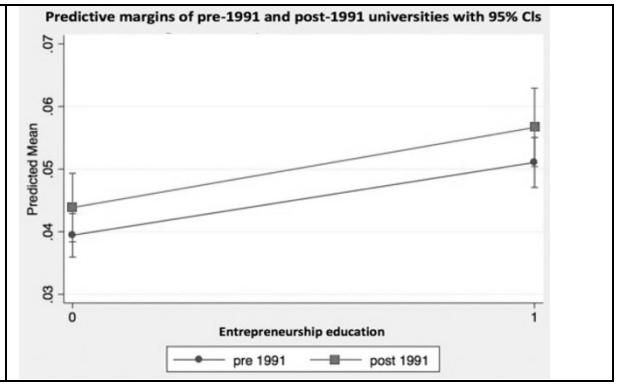
Predicted Mean
Supportive environment
pre 1991
post 1991


Predictive margins of pre-1991 and post-1991 universities with 95% CIs
Predicted Mean
.16
.18
.2
.22
.24
.26
0
1
Entrepreneurship education
pre 1991
post 1991


Predictive margins of pre-1991 and post-1991 universities with 95% CIs
Predicted Mean
.03
.04
.05
.06
.07
0
1
Entrepreneurship education
pre 1991
post 1991