

University-based Entrepreneurial Ecosystems: Regional Specifics in Eastern and Western Europe

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Abstract

This paper discusses regional specificities of university-based entrepreneurial ecosystems with regard to Eastern and Western Europe. With the aim to examine differences between perceived conditions of regional entrepreneurial ecosystems in Slovakia (Kosice region) and Germany (Bergisch Land region), students as potential entrepreneurs in both countries were surveyed. Using the dataset of 487 questionnaires, key factors affecting the intention to become an entrepreneur within the specific conditions of the two regions are examined. Resulting from the econometric model, the intention to become an entrepreneur is more likely expressed by a man who lives in Slovakia and whose father or both parents are entrepreneurs. Based on the results of the model, the decision to become an entrepreneur is also significantly affected by several elements of the entrepreneurial ecosystem, namely access to entrepreneurial education and know-how provided by the university, positive image of an entrepreneur, and the perceived administrative burden of starting a business. Further, descriptive statistics indicate significant regional differences in the perception of motives and barriers to setting up an enterprise. This is an important lesson for policies supporting entrepreneurship in both university regions.

Key words: Entrepreneurial Ecosystems, University-Based Entrepreneurial Ecosystems, Regional Specifics, Entrepreneurial Intentions

JEL Classification: J 23, L 26, O 18

1 Introduction

The extent of entrepreneurial capacity or entrepreneurial capital of the economies of countries and individual regions has been identified as a driver of national and local economic development (e.g. Thurik et al., 2013; Audretsch and Pena Legazkue, 2012). Entrepreneurial capacity consists of both actual new firm formation and latent (potential) entrepreneurship reflected in self-employment preferences (Grilo and Irigoyen, 2006) or, stronger, entrepreneurial intent towards founding a business. This paper explores possible influence factors within the regional university-based entrepreneurial ecosystems (UBEES; Greene et al., 2010) on the entrepreneurial

intentions of university students as latent entrepreneurs from the Kosice region in Slovakia and the Bergisch-Land region in Germany. This examination allows a) studying *differences and similarities* in the two regional entrepreneurial ecosystems and b) identifying possible *effects of specific elements* of the UBEES on students' entrepreneurial intentions.

Concentrating on individual-level intentions as a precursor of entrepreneurial activity is advisable since environmental influences, or in fact any other exogenous impact, on start-up formation will be mediated by the intent of individuals to act entrepreneurially and engage in start-up behaviour (Linan and Chen, 2006; Krueger, 2003). While there is a plethora of research on entrepreneurial intentions and their immediate cognitive antecedents, particularly based on samples of university students and graduates (e.g. Jun Bae, 2014), the further regional factors which may impact upon such intentions has been largely neglected; notable exceptions are the works of Sascha Walter (e.g., Walter et al., 2013; Dhose and Walter, 2012; Walter and Dhose, 2012) as well as the efforts of the GUESSS, the Global University Entrepreneurial Spirit Students' Survey initiative.

This study adds a novel data set to the stream of research on student entrepreneurship from two regions with their universities which have not yet been investigated (e.g. in the GUESSS survey) for the extent of entrepreneurial intentionality amongst their students. Beyond this, the aim of this study is to contribute to a further discussion of the specifics of entrepreneurial ecosystems and the relevance of these specifics in terms of their impacts on the pool of latent entrepreneurship in university regions. An improved understanding of the specific factors of university-based entrepreneurial ecosystems will allow a better fine tuning of entrepreneurship policy and university management at the regional level in the context of general education and economic policy-making. The effectiveness of such approaches will depend on the effects which such ecosystem factors (and policy measures directed at their improvement) will actually have on entrepreneurial intentions of agents. This is essentially since without intent, real start-up behaviour is unlikely – and therefore this paper strives to gain insights in both specific characteristics of UBEES in the regions studied *and* the potential effects of these characteristics on entrepreneurial intentions.

UBEES themselves represent a focused view on the broader concept of entrepreneurial ecosystems defined as:

“A set of interconnected entrepreneurial actors (both potential and existing), entrepreneurial organisations (e.g. firms, venture capitalists, business angels, banks), institutions (universities, public sector agencies, financial bodies) and entrepreneurial processes (e.g. the business birth rate, numbers of high growth firms, levels of ‘blockbuster entrepreneurship’, number of serial entrepreneurs, degree of sell-out mentality within firms and levels of entrepreneurial ambition) which formally and informally coalesce to connect, mediate and govern the performance within the local entrepreneurial environment” (Mason and Brown, 2014, p.5).

The “university-based” perspective demarcates entrepreneurial ecosystems in which the presence of higher education institutions entails essential elements of overall regional entrepreneurial infrastructure. In general, central domains of entrepreneurial ecosystems are political governance and entrepreneurship policy, financing, cultural norms, private-sector support for business formation, human capital, and markets (Isenberg, 2011). Obviously, the main roles to play for universities and other higher education institutions are in building human capital through entrepreneurship (and other) education as well as in generating research output as a potential source of entrepreneurial opportunities, e.g. in technology entrepreneurship. At the same time

university organizations will be embedded in the regional context within the overall entrepreneurial ecosystem and its other elements such as support institutions for start-ups or sources of venture funding available in the region. Similar to Gnyawali and Fogel (1994), who suggested modeling entrepreneurial environments to include the behaviour of latent entrepreneurs (1994), we assume that these elements or factors are perceived by individual agents in the UBEES (in our case students as university members as in our sample), who, for instance, hold beliefs about and attitudes towards the availability of funding, coaching offers or other resources for start-ups in the region.

Commonly, models of entrepreneurial intentions, which are often employ the theory of planned behavior from social psychology (see, e.g., Goethner et al., 2012), explain entrepreneurial intent based on aspects of a) the perceived desirability or attractiveness of founding a business and b) the perceived feasibility or personal self efficacy of starting-up at the level of personal attitudes. In terms of the factors that impact upon these desirability and feasibility attitudes, typically not only environmental but also personal factors are found to be relevant for explaining variance in entrepreneurial intent (Linan et al., 2010). Therefore, our analysis includes both micro-level person-related variables and environmental variables constituting a person-and-situation specific concept of entrepreneurial intent formation as demanded by Krueger (2003). In particular, these potential influences within the UBEES on entrepreneurial intent to be explored pertain to the *person of the student* (e.g. demographic variables and available entrepreneurial role models amongst personal reference people), the *context of the university and its region* (e.g. access to entrepreneurship education or regional start-up support), and the *wider socio-economic and cultural environment* (e.g. the perceived image of entrepreneurs and perceived start-up chances and barriers).

The paper proceeds as follows. Next, within the data and method chapter, in section 2.1 we briefly address entrepreneurial intent as the dependent variable of our model and present the set of possible environmental and personal influences on entrepreneurial intent (the independent variables; section 2.2). Chapter three discusses the logit model built on our sample of students from the two regions which have been investigated in the study. Results are derived in chapter four, the fifth chapter concludes, addressing important limitations and selected research and policy implications from this study.

2 Data Description and Methodology

In this section we present the data and methods which were used. Data collection was carried out through primary research conducted at the Technical University in Košice (Slovakia), University of Pavol Jozef Šafárik in Košice (Slovakia) and University of Wuppertal (Germany). The sample consists of 487 questionnaires, of which 227 were obtained at the universities in Košice and 260 at the University of Wuppertal. In the questionnaire, students were asked to answer 32 questions through the expression of strong agreement, agreement, disagreement and strong disagreement in terms of a four-point Likert-scale with statements concerning the university-based entrepreneurial ecosystem. The output of the questionnaire are on the one hand qualitative variables describing the characteristics of surveyed students, on the other hand variables expressing their views on the

components of university-based entrepreneurial ecosystem. The data obtained from the questionnaires were further processed in the programs *SPSS* and *R*.

2.1 Dependent variable

The dependent variable entering the econometric model is a binary variable reaching a value of 0 or 1, and expresses the intention to start a business ($y = 1$) or not to start a business ($y = 0$) in the future. The dependent variable is obtained directly from the questionnaire through the question in which students should express whether they would like to be an entrepreneur or an employee in the future (a single item measure of intent has been used successfully in prior studies, e.g. in Goether et al., 2009 and Krueger et al., 2000). In our model we used unconditional entrepreneurial intentions as compared to a conditional intent measure (cf. Obschonka et al., 2010). A conditional measure would have been to ask a student whether he or she wants to become an entrepreneur given that he or she had a business idea. The unconditional measure has been preferred because the availability of suitable business ideas (at one's university or in the region) may in fact be part of the perceived UBEES itself.

2.2 Independent variables

Independent variables entering the econometric model can be divided into two groups. The first group of variables consists of some students' predispositions, e.g. their gender, field of study, family background and other characteristics. The selection of independent variables in this group was based on already conducted studies (see chapter one above and, e.g., Linan et al., 2010) which emphasize the importance of certain predispositions by deciding to start a business. Mentioned variables are nominal or binary variables and their overview is given in Table 1.

The second group of variables consists of variables reflecting the attitude of students towards individual components of university-based entrepreneurial ecosystem. Students in the questionnaire were asked to express agreement or disagreement with various statements concerning the university based-entrepreneurial ecosystem. Before entering the econometric model, the data obtained from the questionnaire had to be processed. We used the principal component analysis with the aim to reduce the number of variables. Following the Kaiser's rule, the output of the principal component analysis were ten variables. Overview of the variables included to the second group is shown in the Table 2.

Tab. 1 Variables describing personal influences on entrepreneurial intentions

Variable	Category	Value	Variable	Category	Value
Country (<i>country</i>)	Slovakia (Kosice region)	0	Study branch (<i>branch</i>)	Math	0
	Germany (Bergisch Land region)	1		Information technologies	1
Gender (<i>gen</i>)	Male	0		Electrotechnics	2
	Female	1		Chemistry	3
Region (<i>reg</i>)	Metropolitan area	0		Quality and Security	4
	Urban area	1		Mechanical engineering	5
	Rural area	2		Civil engineering	6
Degree (<i>deg</i>)	Bachelor	0		Economics	7
	Master	1		Biology	8
Family	Nobody is entrepreneur	0		Informatics	9

background (<i>fam</i>)	Father is entrepreneur	1			
	Mother is entrepreneur	2			
	Both are entrepreneurs	3			

Tab. 2 Variables describing environmental influences on entrepreneurial intentions

Variable	Description
Entrepreneurial education (<i>edu</i>)	Perceived level of entrepreneurial education provided by the university
Know how provided by the university (<i>KH_uni</i>)	Perceived level of entrepreneurial know how provided by the university
Know how provided by the region (<i>KH_reg</i>)	Perceived level of entrepreneurial know how provided by the institutions in the region
Support provided by the university (<i>support_uni</i>)	Perceived sufficiency of support provided by the university in terms of entrepreneurship
Support provided by the region (<i>support_reg</i>)	Perceived sufficiency of support provided by the region in terms of entrepreneurship
Image of an entrepreneur (<i>entrep</i>)	Perceived positive image of an entrepreneur
Traditional sources of finance (<i>fin_trad</i>)	Perceived accessibility of traditional sources of finance: <ul style="list-style-type: none"> - Bank loans - Friends/family - Credit card
New sources of finance (<i>fin_new</i>)	Perceived accessibility of new sources of finance: <ul style="list-style-type: none"> - Venture capital - Business angels - Contests and grants
Entrance barriers (<i>market</i>)	Perceived barriers to entrance to the market
Administrative burden (<i>adm</i>)	Perceived administrative burden of starting a business

3 Econometric Model

To investigate the determinants of the decision to start a business we decided to use the logit model which is suitable in the case when the dependent variable is binary. In contrast to the linear regression, logistic regression is not limited by the requirement of normality of residues or homoscedasticity. Testing the independence of the variables showed the presence of multicollinearity. To eliminate multicollinearity we removed the variable *branch* which exhibited unacceptable *GVIF* value and which was insignificant in the model.

Table 3 shows the results of the modified model, the results of testing multicollinearity multicollinearity (*GVIF*) and the verification of the model by the McFadden pseudo coefficient of determination. After removal of the variable *branch*, the null hypotheses assuming no multicollinearity cannot be rejected in any case and the value of the McFadden pseudo R^2 indicates that the model is appropriate.

Tab. 3 Results of the econometric model

Variable	Estimate	Pr(> z)	GVI	Coefficients
COUNTRY (1)	-0.806	0.0052 **	1.611	0.447
GEN (1)	-0.899	0.0003 ***	1.181	0.407
DEG (1)	0.185	0.4907	1.148	1.203
REG (1)	-0.787	0.2128	1.356	0.455
REG (2)	-0.723	0.0821	-	0.485
FAM (1)	1.002	0.0027 **	1.183	2.724
FAM (2)	1.115	0.1438	-	3.051
FAM (3)	1.112	0.0314 *	-	3.041
EDU	0.634	1.67e-05 ***	1.543	1.885
KH_UNI	0.328	0.0252 *	1.675	1.220
KH_REG	-0.214	0.1299	1.528	0.807
SUPP_UNI	-0.209	0.1586	1.784	0.811
SUPP_REG	0.128	0.3862	1.682	1.137
ENTREP	0.282	0.0254 *	1.103	1.326
FIN_TRAD	0.004	0.9722	1.239	1.004
FIN_NEW	-0.011	0.9300	1.181	0.990
MARKET	0.053	0.6730	1.196	1.054
ADM	0.279	0.0304 *	1.290	1.321
McFadden pseudo R²:		0.2311		
Signif. codes:	0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1			

4 Results and Discussion

4.1 Results of the econometric model

The results of the model enable us to evaluate the factors that have statistically significant effect on the intention of students to start a business in the future. In the first group there were six variables of which three were considered to be significant, namely country, gender and family background. Resulting from the model, the chance to start a business is almost 56% higher in the case of students coming from Košice region. In terms of gender, the chance of starting a business is more than 59% higher when respondents were male. This gender effect on entrepreneurial intentionality has been found and replicated frequently in other studies (e.g., most recently, Maesa et al., 2014). With regard to family background, the chance to become an entrepreneur is more than 2.7 times higher if student's father is an entrepreneur and more than 3 times higher if both parents are entrepreneurs. These results are consistent with theoretical assumptions and with the results of previous studies (e.g. Fatoki, 2014), and confirm the importance of certain predispositions for starting a business. An interesting result is, however, a significant difference in the preference of entrepreneurship among students from Slovakia and Germany. This result is closely connected with motivation and barriers to starting a business, which are discussed in the following chapter.

In the second group of variables, we aimed to examine which components of university-based entrepreneurial ecosystem are most important for the students and have the greatest influence on

their decision to start a business. Statistical significance showed four variables. The first one is the variable *education*. The results indicate that if students are satisfied with the level and quality of entrepreneurial education at their university, the chance that they will start a business increases (note though that the overall results of studies on the relation between entrepreneurship education and intentions remain mixed; see the meta-analysis in Jun Bae et al., 2014). A similar result demonstrates the variable *KH_uni*. The chance of starting a business is higher when students perceive positively the quality and availability of entrepreneurial know-how provided by their university. These results seem to have important implications for practice and should emphasize the need for entrepreneurial education to universities. Two more variables were found to be significant among the other components of the entrepreneurial ecosystem, namely the positive image of an entrepreneur and administrative burden. As a consequence from the model, the chances of starting a business increase if students positively perceive the role of an entrepreneur in the society. This result is obvious and corresponds to the statistical significance of the variable *family background*; students growing up in entrepreneurial families don't perceive prejudice about exploitation or negative image of an entrepreneur, whereby such prejudices persist mainly in Eastern Europe up to date (also cf. an earlier study of the image of entrepreneurs by Volkmann and Tokarski, 2010 in East European countries). The last statistically significant variable is the variable *administrative burden*. The results show that the chance to start a business is higher if the perceived level of administrative burden is lower (compare, e.g., Grilo and Irigoyen, 2006 and Ho and Wong, 2006 who studied the effect of similar variables – administrative complexity and regulatory business costs). This result also has significant implications for the practice, namely the administrative procedures of starting a business should be easier and the legislation should be more favorable for entrepreneurs.

4.2 Motivations and barriers to starting a business

When comparing the intention to become an entrepreneur in the two regions we found out that the chance to start a business is almost 56% higher if the students come from the Košice region. In the case of the University of Wuppertal, 67% of surveyed students expressed the intention to be an employee and only 33% of surveyed students rather plan to become an entrepreneur. On the other hand, 44% of students from Košice region expressed their intention to become an entrepreneur and 56% of students see their future as an employee. These different preferences might have their origin in different motivational factors, perceived barriers and also in the different labor market in both regions.

Personal independence, self-realization and the possibility to perform interesting tasks seem to be key **motivating factors** in both regions. This factor was ranked as most essential among students from Košice region (97.7%) as well as among students from Bergisch Land region (98.73%). For the students from Košice region, further important motivational factors were: better earnings prospects (79.31%), freedom of choice of work time and workplace (74.71%) and the opportunity to contribute to society (36.78%). In the case of students from Bergisch Land region, following factors were important: freedom of choice of work time and workplace (72.15%), the realization of business opportunities (64.56%) and better earnings prospect (56.96%). These results indicate an interesting difference in the motivational factors of starting a business that is closely related to differences in the labor market in both regions. In the case of Košice region, the labor market is less flexible and offers fewer jobs for a skilled workforce. This goes in line with inadequate salaries levels; a satisfying salary can be reached only by a very limited group of workers.

Therefore, in the Košice region, a vision of better earning is a strong motivational factor to become an entrepreneur. When looking at Germany, the GEM population survey 2013 reveals that three variables have exerted a substantial influence on the individual perception of entrepreneurship: 1) Fear of failure (49% of the respondents regard that as a barrier to becoming self-employed), 2) View of entrepreneurial opportunities in the regional environment (31% of the respondents consider the entrepreneurial opportunities as positive) and 3) Perception of one's own entrepreneurial skills (38% of the respondents are of the opinion that they possess enough skills to start an enterprise) (Sternberg et al, 2013).

In terms of perceived **barriers** to entrepreneurship, the situation is similar in the both regions. The most significant barrier is the same in both regions, namely lack of funds to start a business, which is even stronger perceived in the Košice region (83%) than in Bergisch Land region (73%). In the Košice region, this barrier is followed by bureaucracy/administrative burden (71%), the risk of failure and the legal and social consequences associated with it (51%) and lack of business ideas and opportunities (42%). In the Bergisch Land region, the second most important barrier is the risk of failure and the legal and social consequences associated with it (68%), which is followed by the bureaucracy/administrative burden (52%) and the lack of business ideas and opportunities (54%).

These results highlight areas, which need to be supported in an effort to enhance entrepreneurship. In Slovakia, support of small businesses and startups is very low (Huttmanová, Adamišín, 2013). Despite many initiatives and projects coming especially from the EU, students in Košice region consider the lack of finance to be to greatest barrier to starting a business. SMEs are often disadvantaged compared to large enterprises and foreign investors who use to gain tax relief and contributions to the creation of new jobs and create unfavorable competitive environment. Small firms are not able to penetrate the market despite a well-designed business plan. These problems, in conjunction with large administrative burden which is continually increasing, lead to a result that people don't realize their business idea even if it has a big potential.

Again when looking at Germany, the results of the GEM expert survey 2013 analyze 16 entrepreneurship-related contextual factors with regard to the scope and quality of the entrepreneurial activities. Of utmost importance for the 'entrepreneurial climate' from a German perspective are public support as positive influential factor and financing, societal values and norms, and regulation and taxation as relevant, negative influential factors (Sternberg et al., 2013).

5 Conclusions

Support of entrepreneurship, especially of university-based entrepreneurship is nowadays an important issue, as the unemployment rates of young people in several regions in Europe are at high levels (e.g. unemployment rate of people under 25 years in Greece (58,3%) or Spain (55,5%); Eurostat, 2013). Using the dataset of 487 questionnaires obtained in two different regions of Europe, key factors affecting the intention to become an entrepreneur within the specific conditions of the two regions have been examined. This further contributes to linking the

research on entrepreneurial intentions with the strand of literature on entrepreneurial ecosystems and the implications on new business formation.

With regard to the econometric model, several conclusions can be drawn. First, according to the results of the model, the intention to become an entrepreneur is more likely expressed by a man who lives in Slovakia and whose father or both parents are entrepreneurs. The decision to become an entrepreneur is also significantly affected by several elements of the entrepreneurial ecosystem, namely access to entrepreneurial education and know-how provided by the university, the overall image of an entrepreneur, and the perceived administrative burden of starting a business.

Other results show, that there are some differences in motivating factors in both regions, which arise mainly as consequence of different labor market conditions, but the perceived barriers to starting a business are mostly the same. The students in both Košice region and Bergisch Land region consider lack of finance and administrative burden to be the main barriers to starting a business. As a consequence, national or regional policies which aim at reducing financial and administrative start-up barriers might exert a positive influence on entrepreneurial intentions and behaviour. A supportive environment for entrepreneurship therefore seems to be of utmost importance in both examined regions. However, this econometric modeling also has its limitations. On the one hand, a prerequisite for statistically significant models is to acquire underlying data of acceptable quality. It would be beneficial if there would be more questionnaires obtained in both regions from a target group that goes beyond students. On the other hand, there are several other factors affecting the intention to become an entrepreneur which have not been investigated in this research, such as personal motivation or personality and traits of entrepreneurs. The influence of these additional influencing factors on entrepreneurial intentions could be examined in these two regions as well. Further research could also extend the conducted research to more regions and countries in Central and Eastern Europe as well as to more target groups at higher education institutions (e.g. university staff and graduates), in particular with regard to the role of entrepreneurial ecosystems and the impact of university and political support on entrepreneurial intentions.

The importance of entrepreneurial ecosystems on entrepreneurial intention in both the Košice and the Bergisch Land region has been highlighted in this research. This is an important lesson for policies supporting entrepreneurship in both university regions, but mainly in Košice region which is nowadays facing big problems with unemployment of graduates and brain-drain of qualified labor force. This problem could be reduced if the support of entrepreneurship and startups would be satisfying.

Acknowledgements

The paper is prepared within the project implementation: *Projekt bezogene Personenaustauschprogramme des DAAD*, Nr. 54433632 and within the project implementation: *University Science Park TECHNICOM for Innovation Applications Supported by Knowledge Technology*, ITMS: 26220220182, supported by the Research & Development Operational Programme funded by the ERDF. "We support research activities in Slovakia/this project is being co-financed by the European Union".

The authors would like to thank Samuel Gerlach, Tobias Bürger and Stefan Römer for their outstanding support throughout the project.

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