

University Environment and Student Entrepreneurship: The Role of Business Experience and Entrepreneurial Self-Efficacy

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Abstract. The study aims to assess how different types of entrepreneurial capital provided by universities affect student involvement in entrepreneurship. The role of university is analyzed from the embeddedness perspective, where purposeful behavior is largely affected by network relationship and the trust that

exists in such relationship. We used data of the Global University Entrepreneurial Spirit Students' Survey (GUESSS) as empirical basis for research. A hierarchical regression data analysis revealed that university initiatives to develop human and social capital influenced positively the extent to which students were engaged in entrepreneurship, while financial capital provided by universities had negative effects. We also investigated the moderating effects of previous business experience and entrepreneurial self-efficacy. It was found that previous experience was able to weaken the relationship between all the three types of resources provided by university with the scope of student start-up activities, including the negative effect of access to financial capital. Meanwhile, entrepreneurial self-efficacy intensifies this negative effect and diminishes the positive effects of university support for human and social capital development.

Keywords: higher education, student entrepreneurship, university human capital, university social capital, entrepreneurial self-efficacy.

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Entrepreneurial careers are usually chosen to gain independency, acquire unique knowledge and skills, be comfortably off, and contribute to the economic development. Universities around the world are launching curricular and extra-curricular activities associated with entrepreneurship [Dickson, Solomon, Weaver, 2008; Morris, Kuratko, Cornwall, 2013]. Nevertheless, there has been no expected in-

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crease in the number of graduates creating ventures so far [Sieger, Fueglistaller, Zellweger, 2014]. A rather low proportion of students are engaged in entrepreneurship, which is normally explained by the inhibited access to necessary financial resources, the lack of relevant knowledge and skills, the imperfect infrastructure, and the shortage of support and business contacts [Kew et al., 2013]. In this regard, some universities attempt to reconsider the conventional methods of entrepreneurship education [Hoskisson et al., 2011].

The university environment can also be conducive to the desire to become an entrepreneur [Behrman et al., 2008; Lee, Peterson, 2000]. Particularly, university climate, shared values and standards, curricula, and focus of extra academic activities affect largely the formation of student entrepreneurial intentions [Bae et al., 2014; Liñán, Urbano, Guerrero, 2011; Saeed, Muffato, 2012; Sesen, 2013; Shirokova, Bogatyreva, Galkina, 2014; Turker, Selcuk, 2009; Zhang, Duysters, Cloudt, 2014]. In order to foster student interest for entrepreneurship, universities offer entrepreneurship programs and get engaged in activities associated with technology commercialization, business incubators, seed funding and mentoring, thus extending the traditional set of educational services [Kauffman, 2013; Khayretdinova, 2014; Morris, Kuratko, Cornwall, 2013].

Contemporary universities differ considerably in the level of entrepreneurship education initiatives and investment in the student venture support infrastructure [Matlay, 2008; Morris, Kuratko, Cornwall, 2013; Shirokova, 2012; Solomon, Matthews, 2014]. It can be assumed that university environment is able to both impede and stimulate student entrepreneurial activity [Reznik, 2010; Welter, Smallbone, 2011], but its impact on student involvement in entrepreneurship cannot be measured. A critical task is to explore the roles specific university environment factors play in the formation and achievement of student entrepreneurial intentions [Fayolle, Liñán, 2014].

This research is aimed at evaluating how different types of entrepreneurship capital provided by universities influence student involvement in entrepreneurial activities. The focus is laid upon venturing efforts related to realization of entrepreneurial intentions. Following the traditional entrepreneurial intentions research patterns (e. g. [Byabashaija, Katono, 2011; Zhang, Duysters, Cloudt, 2014]), we analyze a number of factors that can affect the magnitude and direction of relationships between resources provided by universities, on the one hand, and student entrepreneurial activity, on the other hand. Such factors include personal characteristics of students (such as entrepreneurial self-efficacy, which develops from one's belief in one's ability to succeed), skills and competencies required to create a viable venture [McGee et al., 2009], and previous entrepreneurial or business experience.

The paper contributes to research on early-stage entrepreneurship literature first of all by investigating how different types of re-

sources provided by universities influence student involvement in entrepreneurial activities. Previous studies in this area focused on the role of business planning [Shane, Delmar, 2004], legitimacy [Zimmerman, Zeitz, 2002] and institutions at various levels [Choi, Shepherd, 2004] play in the development and growth of entrepreneurship, but these resources have never been studied in the context of universities. Next, in our research, we pay special attention to the role of personal characteristics students reveal as they implement entrepreneurial initiatives. We assume that personal qualities can influence the relationships between entrepreneurship education and entrepreneurial intentions and activities [Bae et al., 2014; Oosterbeek, Praag, Ijsselstein, 2010; von Graevenitz, Harhoff, Weber, 2010].

In the first part of the paper we outline the theoretical framework of research and generate hypotheses; in the second one we describe the empirical research methods; in the third one we provide the main results; finally, in the fourth part we discuss the results obtained and give recommendations for development of the entrepreneurial infrastructure at universities.

The venture creation process is catalyzed by entrepreneurial intentions, i. e. the willingness to devote oneself to starting and developing one's own business [Krueger, 1993]. Entrepreneurial behavior is shaped through recognizing, evaluating and exploiting entrepreneurial opportunity [Shane, Venkataraman, 2000]. Marco van Gelderen and his co-authors demonstrated that students' entrepreneurial intentions and, hence, their steps to start a business [Van Gelderen et al., 2008] were determined by their attitude towards entrepreneurship as such, which they believe develops under the influence of personal characteristics and contingent factors [Ajzen, 1991; Krueger, Reilly, Carsrud, 2000].

The venture creation process covers the period between the nascent of business intentions until the moment of first sales [Gatewood, Shaver, Gartner, 1995. P. 380] and includes a great number of isolated actions [Carter, Gartner, Reynolds, 1996; Gartner, Carter, Reynolds, 2004; Liao, Welsch, Tan, 2005]. Nascent entrepreneurs are people who are going to create new ventures or are already engaged in activities associated with product development, supply of resources, organization of production, incorporation procedures, first sales, etc. [Souitaris, Zerbinati, Al-Laham, 2007; Verkhovskaya, Dorokhina, Sergeeva, 2014]. The more steps taken, the closer a nascent entrepreneur is to launching a venture [Alsos, Kolvereid, 1998; Carter, Gartner, Reynolds, 1996], as the more time and effort is put into achieving a result, the better the chances this result will finally be achieved [Gatewood, Shaver, Gartner, 1995. P. 373].

Access to various resources is a basic requirement for starting a business [Hanlon, Saunders, 2007; Semrau, Werner, 2014]. An entre-

1. Theoretical Framework and Research Hypotheses

1.1. Entrepreneurial behavior and the venture creation process

preneur may have or not have such access in a specific social context [Danes et al., 2009; Steier, 2007]. When it comes to student entrepreneurship, the role of university in providing access to such resources becomes crucial. University environment can encourage entrepreneurial intentions of students and determine the types of their future ventures to some extent [Politis, Winborg, Dahlstrand, 2010; Shirokova, Bogatyreva, Galkina, 2014].

1.2. University environment and student venture creation

The approach to entrepreneurship as implementation of business opportunities with no account taken of the resources at hand [Stevenson, Jarillo, 1990] seems rather narrow to us. In their empirical study on young entrepreneurs, Wim Hulsink and Daan Koek showed that access to resources played the pivotal role in the process of creating a successful venture [Hulsink, Koek, 2014]. According to the resource-based view, companies develop a strong competitive advantage when they have diverse tangible and intangible resources [Barney, 1991]. Ronald S. Burt suggests dividing all resources into three categories: 1) human capital, as individuals' knowledge, competencies, skills and abilities; 2) social capital accumulated through social networking and participation in the social exchange; and 3) financial capital, i. e. funds required to set a business [Burt, 1992]. Access to all the three resource categories fuels the venture creation process [Klyver, Schenkel, 2013]. In case of student entrepreneurship, the lack of necessary resources may prevent the transition from intention to real action, as well as determine the type of ventures created and affect their performance [Nielsen, Lasssen, 2012].

As a source of resources required for students to create a successful venture, university provides access to knowledge, networking opportunities, and sometimes even funding [Robinson, Sexton, 1994; Shane, 2000; Zhao, Seibert, Hills, 2005]. Its role may be assessed from an embeddedness perspective, which focuses on how planned actions are affected by networking relationships and the trust built in them [Granovetter, 1992]. Any behavior results from a balanced impact of characteristics of a rational individual and the context of their actions. Activities of student entrepreneurs are embedded in the university context, where university environment can be regarded as a source of the abovementioned resources: human capital in the form of knowledge and skills required to start a business; social capital, i. e. ties with entrepreneurs, service providers, investors, etc.; and financial capital in the form of seed money.

1.3. Human capital initiatives offered by universities

Human capital is composed of knowledge, skills and competencies possessed by an individual [OECD, 1998. P. 9]. The concept is built around the idea that people as holders of knowledge, skills and experience can create economic value [Cetindamar et al., 2012]. Contemporary studies on entrepreneurship recognize human capital as the most important of resources possessed by economic agents [Cor-

bett, 2007; Pergelova, Angulo-Ruiz, 2014]. At the same time, it is a key to successful ventures. The level of human capital is normally assessed based on the education obtained and the entrepreneurship and business experience accumulated by individuals [Grichnik et al., 2014; Kirsch, Goldfarb, Gera, 2009].

Student entrepreneurs usually do not have much experience in venture creation or business management. The lack of important skills may drastically impede the transition from entrepreneurial ideas to implementation of them [Pittway, Cope, 2007; Solomon, Duffy, Tarabishy, 2002]. Universities represent a potential source of entrepreneurship knowledge and thus can assist in the development of relevant skills and abilities. This expectation is based on the assumption that one can learn to be an entrepreneur with the help of teachers and mentors instead of learning through one's own experience [Drucker, 1985; Volery et al., 2013]. However, research on efficiency of entrepreneurship education initiatives produces rather discrepant results [Dickson, Solomon, Weaver, 2008; Matlay, 2008; Oosterbeek, van Praag, Ijsselstein, 2010]. Thus, Georg von Graevenitz and his co-authors showed that students' entrepreneurial intentions weakened after attending a course on entrepreneurship [von Graevenitz, Harhoff, Weber, 2010]. Perhaps, this happens because students get to understand how difficult the venture creation process is. Meanwhile, there is no doubt, entrepreneurship courses allow students to accumulate necessary knowledge, which increases their chances for creating a successful venture in the long run. Obviously, entrepreneurship education has a positive impact on human capital development [Martin, McNally, Kay, 2013]. In particular, it contributes to formation of relevant beliefs and principles, as well as the ability to identify and exploit entrepreneurial opportunities and to enhance one's knowledge of entrepreneurship [Volery et al., 2013]. Stein Kristiansen and Nurul Indarti discovered that availability of information on venture creation ins and outs positively related to the development of entrepreneurial intentions [Kristiansen, Indarti, 2004]. Besides, a high level of human capital enhances the likelihood of getting access to other necessary resources. Therefore, knowledge, skills and abilities learned at university may contribute to student engagement in entrepreneurship and implementation of larger scope of start-up activities. Hence, the first hypothesis in this research may be formulated as follows:

H1. Human capital initiatives offered by universities are positively related to the scope of students' venture creation efforts.

Social capital includes resources attained through participation in networks of relationships. People's actions are always embedded in a specific social context and can be shaped by social factors [Liao, Welsch, Tan, 2005]. The higher the level of social capital, the easier entrepreneurs will get the information they need and the faster they

1.4. Social capital initiatives offered by universities

will establish connections with experts, investors, suppliers, distributors and potential customers [Florin, Lubatkin, Schulze, 2003]. Mark Granovetter believes that new ventures are created in the entrepreneur's system of social relationships [Granovetter, 1992]. Social capital is especially crucial for student entrepreneurs as it can help them access other critical resources. Some researchers see development of networks of relationships as the main factor of transition from entrepreneurial intentions to actual venture creation efforts [Sequeira, Mueller, McGee, 2007].

Social capital initiatives offered by universities may include meetings with entrepreneurs and experts in the relevant areas of study, expert-guided business plan competitions, mentorship programs, business incubators, etc. The level of university participation in the development of student social capital can be evaluated by the number of social capital initiatives the university has launched [Nahapiet, Ghoshal, 1998]. Students can use the opportunities provided by the university to solve specific problems and to get help with starting a business.

Nascent entrepreneurs are capable of turning their social capital into "relational capital", i. e. to build relationships of trust with their business partners and turn them to good account [Liao, Welsch, Tan, 2005]. Close social ties open up access to useful information and yield emotional support, which is also extremely important in the venture creation process [Davidsson, Honig, 2003]. What is more, people engaged in networks of relationships with current or former entrepreneurs are more likely to develop a taste for entrepreneurship themselves [Pirolo, Presutti, 2010]. Thus, we may suggest that social capital initiatives offered by universities can encourage students to get involved in venture creation and to increase the scope of their related efforts. Hence the second hypothesis of this research can be formulated as follows:

H2. Social capital initiatives offered by universities are positively related to the scope of students' venture creation efforts.

1.5. Financial capital provided by universities

Financial capital is of paramount importance for the long-term success of a new venture, as it protects against accidental "shocks" and allows for capital-intensive strategic steps [Cooper, Gimeno-Gascon, Woo, 1994]. Access to financial resources is most important at the start-up stage [Kim, Aldrich, Keister, 2006], providing for an opportunity to work in multiple directions, from attending professional exhibitions and developing a marketing strategy to designing, prototyping, and patenting a product [Cetindamar et al., 2012].

Arndt Werner identified two major groups of studies on the issue of financial capital in entrepreneurship: the first group investigates financing needs and associated limitations for nascent entrepreneurs, while the second one searches for possible ways to mitigate those

limitations [Werner, 2007]. Yet, the role of financial resources has been researched less than other business activity factors in literature devoted to nascent entrepreneurship. Despite the growing number of business financing methods, getting access to financial resources at the initial stage of venture creation remains extremely challenging [Schleinkofer, Schmude, 2013], which often results in abandonment of entrepreneurial intentions [Meier, Pilgrim, 1994]. This problem is especially acute for students who often do not have enough savings or a good credit score to get a loan. Consequently, we can expect that student entrepreneurs will respond actively to the opportunity of getting a startup capital under university entrepreneurship programs (grants, shared funding, etc.) [Morris, Kuratko, Cornwall, 2013]. Thus, we are proposing our next hypothesis:

H3. Financing initiatives offered by universities are positively related to the scope of students' venture creation efforts.

Business experience may play a major role in the first steps towards creating a venture [Davidsson, Honig, 2003], enabling students to see new opportunities and choose wisely where to invest effort. When a student has some experience in the venture's industry, they understand the market better and possess specific knowledge and skills that may be very useful for launching a business. Students with business experience have more realistic expectations and a clearer vision of how they should multitask, which is inevitable at the initial stages.

The significance of previous experience has been empirically proved in a number of studies (e. g. [Baron, 2009; Gabrielsson, Politis, 2011; Harms, Schiele, 2012; Sarasvathy, 2001]). However, very few of them touch upon how previous experience affects the relationships between different types of resources provided by universities and student involvement in entrepreneurship. On the one hand, students with experience will appreciate more the opportunity to enhance their knowledge, skills and abilities, understand better how they can benefit from developing networks of relationships and using seed capitals provided by universities. On the other hand, this experience may blur the comprehension of theoretical aspects for such students, providing a wide professional network outside the university and opening up funding opportunities other than university support programs. We can now formulate the following hypotheses about the impact previous business experience has on the relationship between student involvement in entrepreneurship and different resources provided by universities:

H4a. Previous experience can weaken the positive relationship between human capital initiatives offered by universities and the scope of students' venture creation efforts.

1.6. Previous experience and entrepreneurial self-efficacy

1.6.1. Previous business experience

H4b. Previous experience can weaken the positive relationship between social capital initiatives offered by universities and the scope of students' venture creation efforts.

H4c. Previous experience can weaken the positive relationship between financing initiatives offered by universities and the scope of students' venture creation efforts.

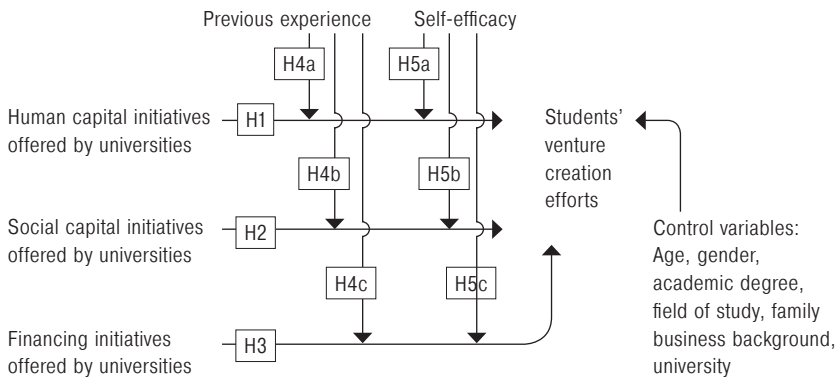
1.6.2. Entrepreneurial
self-efficacy

Entrepreneurial self-efficacy is built around confidence in one's skills, abilities and competencies [Chen, Greene, Crick, 1998; DeNoble, Jung, Ehrlich, 1999; McGee et al., 2009]. The concept of self-efficacy is paramount in the theory of entrepreneurship [Kickul, Krueger, 2004], being one of the key motivators that drive planned behavior and entrepreneurial intentions [Douglas, 2013; Fitzsimmons, Douglas, 2011; Krueger, Reilly, Carsrud, 2000; Wang, Wong, Lu, 2002]. Besides, self-efficacy is a prerequisite for transition from entrepreneurial intentions to actual venture creation efforts [Sesen, 2013].

Perceived self-efficacy refers to beliefs in one's capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands [Wood, Bandura, 1989. P. 364]. In entrepreneurship, it means one is capable of creating and developing a successful venture by using one's personal qualities, skills, and knowledge shaped by family, previous experience and education obtained [Herron, Robinson, 1993; Morris et al., 2013]. Empirical studies show that entrepreneurship education can develop a positive attitude to ventures and increase entrepreneurial self-efficacy of students (e. g. [Chen, Greene, Crick, 1998]). However, students with a high level of self-efficacy perceive university initiatives more critically and do not feel the need to enhance their knowledge of entrepreneurship [Zhao, Siebert, Hills, 2005].

There has been little data on how entrepreneurial self-efficacy affects the relationship between resources provided by universities and the scope of students' venture creation efforts; neither has there been a unanimous conclusion on the nature of this impact. Judging by results of some studies, self-efficacy affects career preferences more than any other socio-cognitive characteristic [Bandura et al., 2001]. Moreover, a high level of self-efficacy boosts the chances of choosing an entrepreneur career [DeNoble, Jung, Ehrlich, 1999]. Self-efficacy can facilitate the transition from entrepreneurial intention to action, making young entrepreneurs believe in their ability to tackle all problems associated with venture creation and development on their own [Hmieleski, Corbett, 2008]. Yet, such entrepreneurs may undervalue the role of resources offered by universities as they tend to rely more on themselves. We can make the following hypotheses here:

Figure 1. **Theoretical model and research hypotheses**



H5a. A high level of self-efficacy can weaken the relationship between human capital initiatives offered by universities and the scope of students' venture creation efforts.

H5b. A high level of self-efficacy can weaken the relationship between social capital initiatives offered by universities and the scope of students' venture creation efforts.

H5c. A high level of self-efficacy can weaken the relationship between financing initiatives offered by universities and the scope of students' venture creation efforts.

The theoretical research model is presented in Figure 1.

Data used in this study was collected by the Global University Entrepreneurial Spirit Students' Survey (GUESSS)¹ managed by Swiss Research Institute of Small Business and Entrepreneurship at the University of St. Gallen. The GUESSS survey has been held every two years since 2003, covering students in various fields of study from all over the world. The GUESSS project pursues three main goals: 1) to explore entrepreneurial intentions and activity of students in different countries within a long period of time; 2) to provide universities with data on how students evaluate entrepreneurship programs (courses, overall infrastructure, etc.); 3) to suggest new ideas for investigation of individual student characteristics and their influence on entrepreneurial intentions and activity [Sieger, Fueglistaller, Zellweger, 2014].

2. Research Methods

2.1. Sampling

¹ Detailed description of the project is available at: <http://www.guesssurvey.org/>.

Each participating country is assigned a project representative who invites universities to take part in the survey. Universities receive a link to the online questionnaire and share it with their students. Participation in the survey is voluntary and questionnaires are completed anonymously to protect confidentiality. 93,265 students from 489 universities in 26 countries received invitations to participate in the 2011 survey, with the response rate of 6.3%. Saint Petersburg State University Graduate School of Management (GSOM) was a national project partner in Russia. The GSOM research team was responsible for finding and engaging Russian universities, translating the questionnaire, and distributing the link among project participants in the country. The data on Russian students were collected from March to June 2011 [Shirokova, Kulikov, 2011].

For the purpose of this study, we only used data on students who had not yet started a business but were intended to become entrepreneurs. Next, we dropped out exchange students as they spent just a few months at the university and thus did not have a chance to use all of the initiatives. Besides, we did not include students born before 1976 and after 1997 as our research was focused on potential young entrepreneurs. The sample also left out universities that had provided less than five completed questionnaires. In the end, the sample we used for analysis covered 31,927 respondents from 25 countries and 282 universities. The average age of students was 24.1 years ($SD = 4.01$), with 47% women and 53% men. Most students were pursuing their Bachelor's degrees (81.2%), of which 35% studied business and economics. Slightly more than half of the respondents (53.3%) reported at least one of their parents was an entrepreneur (Table 1).

2.2. Measurement of variables

Dependent variable. In order to measure the scope of students' venture creation efforts, we developed an index of entrepreneurial activity based on the existing approaches to measuring involvement in entrepreneurship [Grilo, Thurik, 2008; Stam, Thurik, van der Zwan, 2010; van der Zwan, Thurik, Grilo, 2010]. The index is composed of students' answers to the question, "What steps have you already taken to start your own business?" Students were asked to choose between 1 ('Agree') and 0 ('Disagree') to respond to the following statements: 1) "Nothing done so far", 2) "Thought of first business ideas", 3) "Formulated business plan", 4) "Identified market opportunities", 5) "Looked for potential partners", 6) "Purchased equipment", 7) "Worked on product development" 8) "Discussed with potential customers", 9) "Asked financial institutions for funding", 10) "Decided on date of foundation". Total points earned make up the summative index of entrepreneurial activity of a student. Answers to the first statement—"Nothing done so far"—were recoded so that the answer "Yes" would count as zero. Thus, the highest index of entrepreneurial activity was 10 and the lowest was 0. Among the respondents, around 60% had taken two to four steps to create a venture, slightly more than 3%

Table 1. **Descriptive statistics of variables**

Variable	N of obs.	Mean value	Stand. error	Min	Max	Frequencies*	
						Categories	%
Dependent variable							
Venture creation efforts	31,927	2.50	1.91	0	10		
Control variables							
Age	31,927	24.1	4.01	14	36		
Gender	31,927	0.47	0.5	0	1	Female	47.17
Academic	31,927	0.81	0.39	0	1	Bachelor's	81.20
Field of study	31,927	0.36	0.48	0	1	Business & Economics	35.65
Family business background	31,927	0.53	0.5	0	1	Yes	53.31
Moderators							
Previous experience	31,927	0.39	0.49	0	1	Yes	39.22
Self-efficacy	31,927	5.32	0.99	1	7		
University initiatives							
Human capital initiatives offered by universities	31,927	3.96	1.84	0	8		
Social capital initiatives offered by universities	31,927	1.98	1.13	0	5		
Financing initiatives offered by universities	31,927	0.42	0.29	0	1		

Note: * For nominal variables only

took six steps or more, and 16.45% took two steps. The highest index (10 steps) was obtained by 34 students only, which is 0.11% of the sample.

Independent variables. Human capital initiatives offered by universities were measured through the level of relevant knowledge attained by students. Respondents specified the number of entrepreneurship-related courses they had attended, including in 1) general entrepreneurship; 2) family firms; 3) financing entrepreneurial ventures; 4) technology entrepreneurship; 5) social entrepreneurship; 6) entrepreneurial marketing; 7) innovation and idea generation; 8) business planning; 9) other courses. While measuring social capital initiatives offered by universities, we paid special attention to social relations and entrepreneurial mentorship. This variable describes the number of university initiatives available to students: 1) workshops/networking with experienced entrepreneurs; 2) contact platforms with potential investors; 3) business plan contests/workshops; 4) mentoring and coaching programs for entrepreneurs; 5) contact

point for entrepreneurial issues. Financial capital provided by universities was coded as a binary variable, in which the value one (1) means that the university provides some financing initiatives (as a seed funding or in any other form of financial support) and the value zero (0) means that it does not.

*Moderators*². Self-efficacy was measured using the scale proposed in [Zhao, Seibert, Hills, 2005]. Students assessed the level of their confidence in their ability to succeed in the following entrepreneurial functions and objectives: goal setting and achievement; generation of new ideas; development of new products and services; financial analysis; reducing risk and uncertainty; estimated risk acceptance; decision making under risk and uncertainty; time management; taking responsibility for one's ideas and decisions; creating one's own venture; leading one's venture to success. Students rated each item on a scale of 1 ('Not confident at all') to 7 ('Absolutely confident'). Exploratory factor analysis confirmed the one-dimensional factor structure (eigenvalue = 5.27, Cronbach's α = 0.905). We generated interaction terms by multiplying the variable values with the indexes of each type of university entrepreneurship initiatives in order to analyze the moderating role of self-efficacy. A binary variable was used to assess previous experience of students, who were asked, "Have you already made professional work experience that are relevant to your company to be founded?" Answers "Yes" and "No" were coded as 1 and 0, respectively. This variable was also multiplied by the indexes of each type of university initiatives to generate interaction terms.

Control variables. Individual characteristics of students that can affect the scope of their venture creation efforts were used as control variables. These include the following socio-demographic parameters: age, gender, academic degree (Bachelor's/other), field of study (business and economics/other), and family business background (at least one parent is an entrepreneur). The importance of these control variables for entrepreneurship has been proved in earlier studies [Arenius, Minniti, 2005; Bhandari, 2012; van der Zwan, Thurik, Grilo, 2010].

2.3. Statistical data analysis methods

The stated hypotheses were tested using hierarchical regression analysis, where variables were entered into the model sequentially, the control variables coming first. As long as the dependent variable (the scope of venture creation efforts) was measured in nonnegative integers and only few maximum values existed (the highest index of entrepreneurial activity), we decided to use a model with a Poisson

² Moderators are variables that can change the strength of the relationship between independent and dependent variables. In this study, moderating effects were tested by introducing interaction terms, i. e. products of the independent variable and the respective moderator.

Table 2. **Correlation matrix**

№	Variable	1	2	3	4	5	6	7	8	9	10	11
1	Venture creation efforts	1.00										
2	Age	0.12*	1.00									
3	Gender	-0.17*	-0.06*	1.00								
4	Academic degree	-0.03*	-0.28*	0.02*	1.00							
5	Field of study	0.05*	-0.09*	0.02*	0.007	1.00						
6	Family business background	0.08*	-0.02*	0.006	0.06*	0.009	1.00					
7	Previous experience	0.24*	0.26*	-0.09*	-0.08*	-0.02*	0.06*	1.00				
8	Self-efficacy	0.25*	0.01*	-0.06*	0.15*	0.09*	0.1*	0.11*	1.00			
9	Human capital initiatives offered by universities	0.12*	0.02*	-0.006	0.07*	0.21*	0.05*	0.03*	0.2*	1.00		
10	Social capital initiatives offered by universities	0.12*	-0.01*	-0.003	0.11*	0.08*	0.07*	0.03*	0.23*	0.56*	1.00	
11	Financing initiatives offered by universities	0.02*	0.02*	0.05*	0.13*	-0.02*	0.03*	0.004	0.18*	0.31*	0.35*	1.00

Note: * significance level $p=0.05$.

distribution. University clusters were taken into account and standard errors were grouped at the university level to prevent estimation bias. Besides, a multicollinearity test confirmed that the variance inflation factor (VIF) was under 2, which is less than the recommended maximum of 5. The absence of multicollinearity can also be verified by checking the correlation coefficients between the main variables [Debrulle, Maes, Sels, 2014; Hair et al., 1998].

Tables 1 and 2 contain descriptive statistics and the correlation matrix of the variables used in research, and Table 3 displays the results of the regression analysis. Taking the hierarchical regression model evaluation procedure as a basis, we began by analyzing the basic model (Table 3, model I), which included control variables only, and then added all the other independent variables step by step (models II—IX). Predictably, we found a significant positive relationship between age and the scope of venture creation efforts. Business and economics field and family business background also had a positive impact on student entrepreneurial activity. Besides, bachelor and female students were found to have taken fewer steps towards starting a business than other students.

Hypothesis 1 suggested that human capital initiatives offered by universities was positively related to the scope of students' venture creation efforts. The results in Table 3 confirm this hypothesis and re-

2.4. Data analysis results

Table 3. Estimation of coefficients before variables determining the scope of venture creation

Variables			
	I	II	III
Control variables			
Age	0.010*** (0.002)	0.010*** (0.002)	0.010*** (0.003)
Gender	-0.216*** (0.010)	-0.216*** (0.010)	-0.216*** (0.010)
Academic degree	-0.071*** (0.022)	-0.077*** (0.023)	-0.080*** (0.022)
Field of study	0.060*** (0.011)	0.040*** (0.012)	0.053*** (0.011)
Family business background	0.076*** (0.009)	0.074*** (0.009)	0.072*** (0.009)
University initiatives			
Human capital initiatives offered by universities		0.026*** (0.008)	
Social capital initiatives offered by universities			0.042*** (0.011)
Financing initiatives offered by universities			
Previous experience	0.285*** (0.010)	0.284*** (0.011)	0.284*** (0.011)
Previous experience × Human capital initiatives offered by universities			
Previous experience × Social capital initiatives offered by universities			
Previous experience × Financing initiatives offered by universities			
Self-efficacy	0.177*** (0.014)	0.168*** (0.012)	0.166*** (0.011)
Self-efficacy × Human capital initiatives offered by universities			
Self-efficacy × Social capital initiatives offered by universities			
Self-efficacy × Financing initiatives offered by universities			
Constant	0.620*** (0.058)	0.543*** (0.080)	0.551*** (0.078)
Wald χ^2	3,107.34	3,276.55	3,245.06
N of obs.	31,927	31,927	31,927

Note: * $p < 0,10$; ** $p < 0,05$; *** $p < 0,01$; Prob > $\chi^2 = 00000$; models were fitted using the maximum likelihood method.

efforts

Model							
IV	V	VI	VII	VIII	IX	X	XI
0.010*** (0.002)	0.010*** (0.002)	0.010*** (0.002)	0.010*** (0.002)	0.010*** (0.002)	0.010*** (0.002)	0.010*** (0.002)	0.010*** (0.002)
-0.215*** (0.010)	-0.212*** (0.010)	-0.213*** (0.010)	-0.212*** (0.010)	-0.211*** (0.010)	-0.212*** (0.010)	-0.212*** (0.010)	-0.212*** (0.010)
-0.066*** (0.020)	-0.071*** (0.020)	-0.070*** (0.020)	-0.071*** (0.020)	-0.072*** (0.020)	-0.074*** (0.021)	-0.075*** (0.021)	-0.073*** (0.021)
0.059*** (0.011)	0.036*** (0.011)	0.037*** (0.011)	0.037*** (0.011)	0.036*** (0.011)	0.035*** (0.012)	0.036*** (0.011)	0.035*** (0.011)
0.076*** (0.009)	0.071*** (0.009)	0.072*** (0.009)	0.072*** (0.009)	0.071*** (0.010)	0.070*** (0.009)	0.070*** (0.009)	0.070*** (0.009)
	0.020*** (0.006)	0.029*** (0.006)	0.020*** (0.006)	0.020*** (0.006)	0.025*** (0.004)	0.020*** (0.006)	0.020*** (0.006)
	0.036*** (0.007)	0.036*** (0.007)	0.044*** (0.007)	0.036*** (0.007)	0.036*** (0.007)	0.044*** (0.005)	0.037*** (0.007)
-0.050* (0.029)	-0.135*** (0.021)	-0.136*** (0.021)	-0.135*** (0.021)	-0.164*** (0.022)	-0.131*** (0.021)	-0.131*** (0.021)	-0.112*** (0.020)
0.285*** (0.010)	0.282*** (0.011)	0.361*** (0.024)	0.316*** (0.022)	0.255*** (0.021)	0.283*** (0.011)	0.282*** (0.011)	0.282*** (0.011)
		-0.019*** (0.004)					
			-0.016** (0.007)				
				0.064* (0.035)			
0.180*** (0.013)	0.169*** (0.010)	0.169*** (0.010)	0.169*** (0.010)	0.169*** (0.010)	0.239*** (0.013)	0.225*** (0.010)	0.207*** (0.010)
					-0.017*** (0.002)		
						-0.028*** (0.004)	
							-0.087*** (0.016)
0.631*** (0.060)	0.531*** (0.082)	0.493*** (0.079)	0.515*** (0.078)	0.545*** (0.079)	0.512*** (0.078)	0.522*** (0.079)	0.521*** (0.082)
3,355.99	3,629.46	3,921.85	3,883.53	3,488.99	3,949.38	4081.79	3724.96
31,927	31,927	31,927	31,927	31,927	31,927	31927	31927

main unchanged in all specifications of the model (model II: $b=0.026$, $p<0.01$; model V: $b=0.020$, $p<0.01$). Hypothesis 2 was also validated, a higher number of social capital initiatives offered by universities resulted in a greater scope of students' venture creation efforts (model III: $b=0.042$, $p<0.01$; model V: $b=0.036$, $p<0.01$). Financing provided by universities proved to have a significant negative effect on student entrepreneurial activity (model IV: $b= -0.050$, $p<0.1$; $b= -0.135$, $p<0.01$), i. e. hypothesis 3 was not supported by the data.

Let us turn to analyzing the moderating effects now. Hypotheses 4a, 4b and 4c assumed that previous business experience of students might be a negative moderator for the relationship between entrepreneurship initiatives offered by universities and the scope of students' venture creation efforts. The research data shows a positive relationship between previous experience and student entrepreneurial activity. As it follows from models VI–VIII in Table 3, all moderating effects are significant but partial, as coefficients before the main independent variables also retain their significance across models. The results obtained confirm hypotheses 4a and 4b. Previous business experience weakens the relationship between human capital (model VI: $b= -0.019$, $p<0.01$) and social capital (model VII: $b= -0.016$, $p<0.05$) initiatives offered by universities, on the one hand, and the scope of students' venture creation efforts, on the other. At the same time, the coefficient on the interaction term between financial capital provided by university and previous business experience is significant and positive (model VIII: $b=0.064$, $p<0.1$). Testing of hypothesis 4c had surprising results: the analysis revealed a negative effect of financial capital on the scope of student entrepreneurial activity; yet, the interaction term between financial initiatives and previous experience proved to exert a positive influence on this relationship, mitigating the negative effects of financial capital.

Analysis of self-efficacy as another moderating effect shows its positive impact on the scope of venture creation efforts (Table 3). According to hypotheses 5a, 5b and 5c, self-efficacy as a positive moderator can weaken the relationship between university initiatives and student entrepreneurial activity. Otherwise speaking, a higher level of confidence in one's skills, competencies and ability to succeed weakens the positive relationship between human capital (model IX: $b= -0.017$, $p<0.01$) and social capital (model X: $b= -0.028$, $p<0.01$) initiatives offered by universities, on the one hand, and the scope of venture creation efforts, on the other hand. Analysis of model XI demonstrated a high negative coefficient before the interaction term between the financial capital provided by university and self-efficacy (model XI: $b= -0.087$, $p<0.01$). That is, a higher level of student self-efficacy exacerbates the negative effects that financing initiatives offered by universities have on entrepreneurial activity. Table 4 gives a summary of hypothesis testing results.

Table 4. Summary of main findings

H	Hypothesis	Coefficient estimation, significance	Result	Explication
H1	Human capital initiatives offered by universities ⇒ The scope of venture creation efforts	0.020***	Supported	The higher the number of human capital initiatives offered by universities, the larger the scope of students' venture creation efforts
H2	Social capital initiatives offered by universities ⇒ The scope of venture creation efforts	0.036***	Supported	The higher the number of social capital initiatives offered by universities, the larger the scope of students' venture creation efforts
H3	Financing initiatives offered by universities ⇒ The scope of venture creation efforts	-0.135***	Disproved	The higher the number of financing initiatives offered by universities, the smaller the scope of students' venture creation efforts
Moderating effect of previous experience				
H4a	Human capital initiatives offered by universities ⇒ The scope of venture creation efforts	-0.019***	Supported	Previous experience weakens the positive correlation between human capital initiatives offered by universities and the scope of students' venture creation efforts
H4b	Social capital initiatives offered by universities ⇒ The scope of venture creation efforts	-0.016**	Supported	Previous experience weakens the positive correlation between social capital initiatives offered by universities and the scope of students' venture creation efforts
H4c	Financing initiatives offered by universities ⇒ The scale of venture creation efforts	0.064*	Disproved	Previous experience weakens the negative correlation between financing initiatives offered by universities and the scale of students' venture creation efforts
Moderating effect of self-efficacy				
H5a	Human capital initiatives offered by universities ⇒ The scope of venture creation efforts	-0.017***	Supported	A high level of self-efficacy weakens the positive correlation between human capital initiatives offered by universities and the scope of students' venture creation efforts
H5b	Social capital initiatives offered by universities ⇒ The scope of venture creation efforts	-0.028***	Supported	A high level of self-efficacy weakens the positive correlation between social capital initiatives offered by universities and the scope of students' venture creation efforts
H5c	Financing initiatives offered by universities ⇒ The scope of venture creation efforts	-0.087***	Disproved	A high level of self-efficacy strengthens the negative correlation between financing initiatives offered by universities and the scope of students' venture creation efforts

Note: * $p < 0,10$; ** $p < 0,05$; *** $p < 0,01$.

3. Discussion Possibility of using various types of capital provided by universities is one of the key factors determining the scope of student entrepreneurial activity. Results of this study allow us to describe more precisely how university environment affects student involvement in entrepreneurship. A positive relationship was found between human capital initiatives offered by universities and the scope of students' venture creation efforts, which means one can learn to be an entrepreneur, including with the help of teachers and mentors [Dickson, Solomon, Weaver, 2008]. Participation in education initiatives can help students develop skills and abilities required to translate entrepreneurial ideas into action [Pittway, Cope, 2007; Solomon, Duffy, Tarabishy, 2002]. Knowledge acquired in entrepreneurship courses is helpful in identifying business opportunities and generating viable business ideas. Entrepreneurship courses provide students with analytical tools necessary in a venture's infancy, such as feasibility evaluation methods, business planning techniques, or risk mitigation strategies. Skills like these help students expand their entrepreneurial activities at a faster pace.

Social capital initiatives offered by universities also have a positive effect on the scope of students' venture creation efforts. This result is consistent with Peter Witt's conclusion that networks of relationships are a key factor of success for young ventures [Witt, 2004]. Students can benefit from social capital accumulated with the help of universities, which connect them with entrepreneurs through various projects and competitions. Besides, interaction with successful entrepreneurs boosts the chances of choosing an entrepreneurial career [Davidsson, Honig, 2003; Liao, Welsch, Tan, 2005]. Therefore, universities should pay attention not only to education initiatives but also to planning and organization of events contributing to the social capital of students and providing an opportunity for discussion of startup-related problems. Mentorship can be a productive way of teaching students how to build and manage networks of relationships.

Unexpectedly, the research revealed a negative impact of financing initiatives offered by universities on the scope of students' venture creation efforts. This possibility was predicted by Kim Klyver and Mark T. Schenkel [Klyver, Schenkel, 2013]. A number of reasons may be behind this impact. First, students who don't qualify for financial capitals may abandon the idea of expanding their entrepreneurial efforts to the levels that require large investments. Second, students who do qualify may miss a number of important steps like making a clear formal business plan, thinking they can do without it. The research data signals universities should review their methods of organizing student venture financing programs. In particular, they could provide smaller capitals to more students, starting from a specific stage in venture creation.

Previous business experience is able to weaken the positive effect of human and social capital initiatives and the negative effect of

financial initiatives offered by universities. Entrepreneurial experience can replace to some extent the resources provided by universities, allowing future entrepreneurs to acquire knowledge and skills in various fields [Stuetzer, Obschonka, Schmitt-Rodermund, 2013. P. 98]. Previous experience can also enhance the belief in one's ability to succeed, which is important in taking venture creation steps. Students with experience may think they already have the knowledge required to create a venture and sufficient networks of business relationships. They may believe entrepreneurship courses and events held by universities to develop their social capital do not contribute directly to their venture creation opportunities. Students with previous business experience can adequately appreciate the benefits of getting additional financing, have a clearer idea of the most productive ways to use the funds, and are able to conduct a comparative analysis of potential returns on alternative investments.

Entrepreneurial self-efficacy is positively related to the scope of venture creation efforts, diminishing the positive effect of human and social initiatives and enhancing the negative effect of seed capital initiatives offered by universities. A number of studies have shown that a high level of self-efficacy results sometimes in overconfidence in one's abilities [Bandura, Jourden, 1991; Stone, 1994], when student entrepreneurs believe they already have all the necessary knowledge and skills and that university initiatives are not particularly valuable to them. As they qualify for financing programs, they can find it unnecessary to continue with the venture creation steps considered essential by entrepreneurship researchers.

Thus, this study has established the opposite direction of impact that previous experience and entrepreneurial self-efficacy have on the correlation between financing initiatives offered by universities and the scope of students' venture creation efforts.

This study focused on the role played by university environment in the development of student entrepreneurial intentions. The contribution to the theory of early-stage entrepreneurship consists in describing more precisely how human capital, social capital and financing initiatives offered by universities affect the process of student venture creation. Besides, we analyzed the impact of previous experience and entrepreneurial self-efficacy on the development of relationships between the access to university resources and entrepreneurial activity of students. The results open up a huge range of future research directions to explore deeper the influence of university environment on student entrepreneurial activity.

The findings obtained may come useful for developers of university entrepreneurship support programs. Students differ dramatically from other types of entrepreneurs in terms of previous experience and self-efficacy, so standardized approaches to entrepreneurial re-

4. Conclusion

sources (financial capital first of all) that do not consider these specific aspects may reduce overall performance and efficiency of student entrepreneurship support programs. Seed capital initiatives are usually designed to promote universities as institutions encouraging entrepreneurial efforts of students but may have counterproductive outcomes. The exception is when seed capitals are granted to students with experience in the venture field.

Results of this study must be taken with due account for existing limitations. First, we assessed entrepreneurship initiatives offered by universities at the same time as entrepreneurial activity of students. However, effects of university programs can absolutely manifest themselves over time. Further research in this area should take this delayed impact into consideration. Second, we didn't control the relationship between the scope of student venture creation efforts and actually launching a business. Finally, we converted resources provided by universities into aggregate variables, although specific components of entrepreneurial resource development programs (e.g. various courses, events to connect students with experts and entrepreneurs, or different forms of financial support) can have different effects on student entrepreneurial activity. Differentiated assessment of such effects and their combined influence may also be a direction for further research.

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