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Working Paper

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Working Paper, No. 03/17

Provided in Cooperation with:

Institut für Mittelstandsforschung (IfM) Bonn

Suggested Citation: Bijedić, Teita; Chlosta, Simone; Nielen, Sebastian; Werner, Arndt (2017) : Mind the gap: Institutional and individual antecedents of entrepreneurial trajectories in the academic context, Working Paper, No. 03/17, Institut für Mittelstandsforschung (IfM) Bonn, Bonn

This Version is available at:

<http://hdl.handle.net/10419/173176>

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Teita Bijedić, Simone Chlosta, Sebastian Nielen and Arndt Werner

Working Paper 03/17

Institut für
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Suggested citation: Bijedić, T.; Chlosta, S.; Nielen, S.; Werner, A. (2017): Mind the Gap: Institutional and Individual Antecedents of Entrepreneurial Trajectories in the Academic Context, in: IfM Bonn: Working Paper 03/17, Bonn.

Impressum

Herausgeber

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Telefax +49/(0)228 / 72997 - 34

Working Paper03/17

ISSN 2193-1879 (Internet)
ISSN 2193-1860 (Print)

Bonn, Dezember 2017

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des privaten Rechts.

Gefördert durch:



Bundesministerium
für Wirtschaft
und Energie

aufgrund eines Beschlusses
des Deutschen Bundestages

Ministerium für Wirtschaft, Innovation,
Digitalisierung und Energie
des Landes Nordrhein-Westfalen



MIND THE GAP: INSTITUTIONAL AND INDIVIDUAL ANTECEDENTS OF ENTREPRENEURIAL TRAJECTORIES IN THE ACADEMIC CONTEXT

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ABSTRACT

This study analyses institutional, job-related, and individual antecedents of entrepreneurial activities from a longitudinal perspective. We take a holistic look at the start-up process incorporating entrepreneurial gestation activities (nascent entrepreneurship) and finally business creation (entrepreneurship) by combining two waves of a survey with a time interval of three years. Focusing on researchers reporting an entrepreneurial intention in wave one we found for example that pull factors as motivation to start a business reduce the probability to give up the business idea. Furthermore having generated an invention prevents researchers with a business idea from becoming a so-called "quitter" and pushes them towards starting their own business.

Keywords: Academic Entrepreneurship, Nascent Entrepreneurship, Institutions

JEL: L20, L26

Zuvor eingereicht als Abridged Paper zu BCERC 2017 Konferenz, nicht veröffentlicht.

Datum: 04.12.2017

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INTRODUCTION

Generating inventions and/or founding businesses are important activities for the economic growth and structural change, particularly in knowledge-driven societies. Especially the research output of academic staff in institutions of higher education is a great source of innovations and commercially utilizable knowledge. Therefore these institutions make great efforts to establish and incorporate services and infrastructure to facilitate the commercial exploitation of inventions, e.g. by incentivizing academic entrepreneurship. However, knowledge of great commercial potential still seems to remain unexploited and entrepreneurial processes to be discontinued.

There is existing body of literature concentrating on factors influencing the likelihood of leaving the former employer (here the universities) to enter entrepreneurship specific structural conditions, incentives and their changes (e.g. Rasmussen & Borch 2010, O'Shea et al. 2004) as well as the impact of individual antecedents on entrepreneurial propensity, like motivation (e.g. Grandi & Grimaldi 2005), attitudes (Goethner et al. 2012), working experience (e.g. Krabel & Mueller 2009) or scientific achievements (e.g. Van Looy et al. 2011). However, these studies either focus on single determinants; i.e. they do not simultaneously test for the effects of individual, career-related, and institutional conditions on the entrepreneurial activity of academics, or they are conducted with rather restricted and/or cross-sectional samples. Thus, although there have been some studies on the antecedents of entrepreneurial gestation activity (Brixy et al. 2010; Parker, Belghitar 2006), the understanding of the driving forces behind these factors is still in its infancy. Especially, research literature on the effectiveness of incentives and support schemes within academic entrepreneurship from a longitudinal perspective is scarce. This is striking particularly due to the entrepreneurial gestation gap between those having entrepreneurial intentions and those actually proceeding to the start-up process up to finally founding a business: almost one out of three individuals with high entrepreneurial intentions gives up on their venture plans one year later (Werner 2011). Thus, in order to enhance the effectiveness of incentives and support systems for commercial exploitation of inventions and entrepreneurial activities of researchers, it is important to understand the specific factors influencing the decisions of academic scientists to pursue entrepreneurship along the stages of the venture creating process.

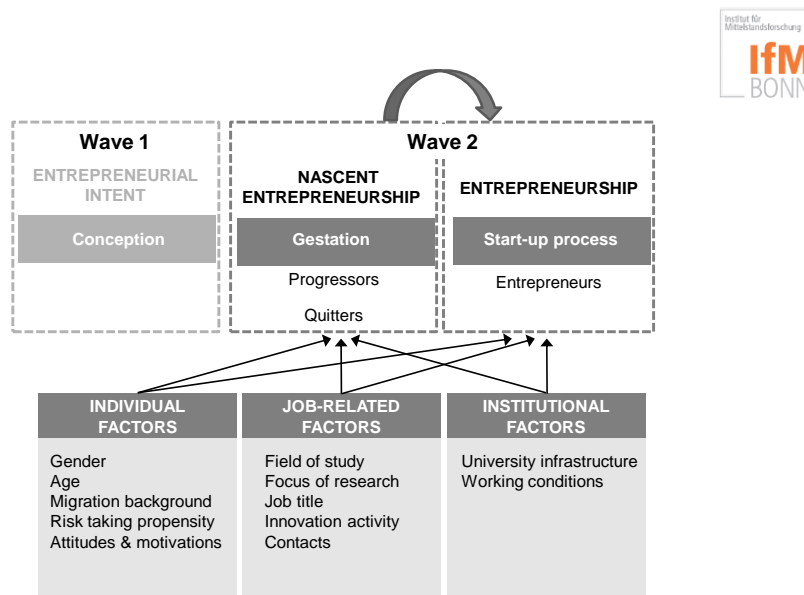
CONCEPTUAL FRAMEWORK

In order to close the described research gaps, we take a process-oriented, holistic and longitudinal perspective on different stages of venture creation: We simultaneously incorporate institutional, job-related and individual antecedents of entrepreneurial intentions and activities within our analysis. Furthermore, we take a closer look at the vocational history and trajectories of the academic scientists as well as their innovation activities and entrepreneurial motives, in order to determine, whether and how they impact entrepreneurial activities. In particular, we compare the progression of entrepreneurial intentions and behaviour within a time frame of three years. For this purpose we conduct a survey which consists of two waves. By this unique longitudinal approach, we are able to detect specific determinants for each stage of the entrepreneurial process.

We look at the start-up process incorporating three stages of venture creation based on Reynolds (2000), which is illustrated in Figure 1. The first stage of the venture creation process by Reynolds (2000, 2004) describes the "Conception" of a business idea and marks the threshold from mere entrepreneurial intentions to nascent entrepreneurship. Based on the first wave of our survey we identify researchers with an entrepreneurial intention. This group is the focus for the actual analyses of this paper which begins in the second stage. The second stage called "Gestation" includes undertaking first steps towards implementation, which can result into progressing towards

the business founding as well as giving up on the business idea. The third stage marks the "Birth" of the venture, i.e. the founding and start of the business. Within the second stage we analyse potential factors for giving up the business plans instead of pursuing with it. Furthermore we analyse the switch between the second and third stage which means to start the business (entrepreneurship). The actual analyses of this paper are based on the second wave of our survey.

Figure 1: Stages of venture creation.



Sources: Reynolds (2000, 2004); Barron (2007); Bijedic et al. (2014, 2016).

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Reynolds (2000) defines a *nascent entrepreneur as someone who starts investing time and resources into business foundation*. Following the above-mentioned definition of nascent entrepreneurship and by incorporating it into our stage model of venture creation, we argue that the first two stages (Conception and Gestation) mark (different degrees of) nascent entrepreneurship, while the stage of starting up a business marks entrepreneurship in its early stage. We expect that specific variables exist which foster or hinder the progression of nascent entrepreneurship and venture creation. Previous research reveals the impact of several internal and external factors influencing the entrepreneurial process and behaviour at different stages.

Examining the three-year-period in our survey, we argue that within the group of nascent entrepreneurs, there can be found different categories of individuals. We subdivide the group of nascent entrepreneurs into individuals, which showed activities towards business start-up during the last three years (so called "progressors") and individuals who gave up on the previously generated business idea (so called "quitters"). Based on our previous findings within the first wave of the survey, we found that three clusters of determinants impact entrepreneurial and innovation

activities of academic staff at institutions of higher education: individual, career-related, and institutional factors (Bijedic et al 2014, 2017). In the following, we derive expectations for the effects of individual, career-related, and institutional factors on the different stages of academic entrepreneurship.

Individual factors: We take into account a variety of individual factors which have been found to influence the different stages of entrepreneurship. However, we apply them to the academic context. It is already shown that individual factors as age (Murray 2004), gender (Bunker-Whittington & Smith-Doerr 2008) or nationality (Bijedic et al. 2014; Welter et al. 2015) have an impact - either direct or moderating - on the propensity to become an entrepreneur. But not only demography has an impact, also personality and motivational characteristics affect entrepreneurial propensity and behaviour, for example risk-taking propensity (Jones & Bouncken 2008).

Career-related factors: Previous research has shown the impact of several career-related factors on entrepreneurial intentions as well as on entrepreneurial behaviour. These factors include preferred fields of study and sectors, which provide different levels of entrepreneurial and innovation opportunities (e.g. more opportunities in the STEM fields) (Quesenberry 2007). Furthermore the acquisition of human capital, within and outside of academia, going along with the appointed position and job title, also leads to different degrees of innovation and entrepreneurial activities (Polkowska 2013).

Institutional factors: Institutions partly determine the working conditions of the individuals. Furthermore support infrastructure available for researchers has a huge effect on invention behaviour and academic entrepreneurship. Besides objective effects the subjective evaluation of individual working conditions is also crucial for the development of entrepreneurial intentions and behaviour. This includes first of all the satisfaction with current working conditions, perceived autonomy but also possible barriers like aversive association with being self-employed.

METHOD

We conduct a survey among academics in Germany which consists of two waves. The scientists were interviewed in fall 2013 for the first time. Based on more than 7,000 completed interviews in 2013 we conducted a second wave in fall 2016. By means of the two waves we analyse the progress of the researchers' entrepreneurial intentions over time. We proceed in two steps. First, **within the stage of nascent entrepreneurship** we analyse possible determinants of becoming a so-called "quitter" which means giving up the business idea. Second, we focus on the subsequent **stage of entrepreneurship**. Therefore we analyse possible factors influencing the start of the business (becoming an entrepreneur) within the duration of three years, i.e. within the two waves of our survey.

Dependent Variables

Within our empirical analysis we make use of two different dependent variables. The first one contains information about academics who gave up their business plans between the first and second wave of our survey (quitters). This means, that the respective person does not report any entrepreneurial intention in the second wave anymore. The dummy variable takes the value one, if the business idea is not pursued anymore and zero if the business idea is still pursued (progressors). The second dependent variable distinguishes between academics already having started their business (entrepreneurs) and those who did not. This variable takes the value of one if the business

has already been started and zero otherwise. It also refers to the period of three years between the two waves of our survey.

Independent Variables

Within the group of individual factors we analyse the role of gender, age, migration background, risk-taking propensity and motivations to start a business. Regarding the motivation we distinguish between individual fulfilment, practical orientation, work-life-balance, earnings, the realisation of own ideas, the realisation of professional experience, autonomy and the fear of unemployment. The group of job-related factors consists of entrepreneurial experience, innovation activity (inventions), contacts (business- and non-business-related), field of research (STEM versus non-STEM), professorship and the focus of research. Regarding the focus of research we differentiate between only basic research (reference category), only applied research and a combination of both. Furthermore we take into account multi-disciplinary research. We also analyse institutional factors like university infrastructure (entrepreneurial consulting and technology transfer office) and working conditions (working situation in general and income satisfaction). Except age all variables are binary dummy variables. The variable age is measured in years. All independent variables refer to the first wave of our survey conducted in 2013.

RESULTS

Since both dependent variables are binary we estimate probit regression models. Due to an easier interpretation average marginal effects are reported instead of coefficients. Because of reasons of space we report only effects in table one which are significant in at least one of both regression models. Each regression model in table one includes all independent variables mentioned above. Combining both waves of our survey we are able to shed more light on the development of entrepreneurial intentions, the stage of nascent entrepreneurship as well as the start-up process. Regarding the probability to become a quitter within the time frame of three years after the first wave of our survey individual as well as career-related are relevant. Female academics are found to have a higher probability to give up their business plans. Age is also positively linked to the probability to give up the business plans. Also the motivation to start a business is relevant to distinguish between those who give up their business idea and those who still pursue. Individual fulfilment, practical orientation and work-life-balance as motives to start a venture are found to reduce the probability to become a quitter. Job-related factors are also relevant to explain the probability that the business idea is not pursued anymore. Academics with entrepreneurial experience as well as those being active in the field of STEM are less likely to give up their business plans. The same is true for scientists whose research is marked by working in teams consisting of different faculties. Scientists who reported that they are conducting basic and applied research are also less likely to give up their business plans compared to scientist only conducting basic research. Academics who have already generated an invention also have lower probabilities to give up their business plans.

Table 1: Average marginal effects after probit regressions

Variables	(1)		(2)	
	Quitters versus Progressors		Entrepreneurs versus Quitters and Progressors	
Individual factors				
Gender: Female	0.153***	(0.0591)	-0.141**	(0.0561)
Age	0.00638**	(0.00308)	0.000543	(0.00278)
Risk-taking: Yes	0.0591	(0.0684)	0.0788*	(0.0469)
Motivation: Individual fulfilment	-0.103*	(0.0618)	0.00896	(0.0559)
Motivation: Practical orientation	-0.163***	(0.0552)	-0.00786	(0.0476)
Motivation: Work-life-balance	-0.123*	(0.0644)	0.0240	(0.0512)
Job-related factors				
Entrepreneurial Experience: Yes	-0.201**	(0.0903)	0.0417	(0.0638)
STEM: Yes	-0.0801	(0.0624)	-0.0917*	(0.0483)
Research: Basic and Applied	-0.131*	(0.0790)	-0.0202	(0.0624)
Research: Multi-disciplinary	-0.167***	(0.0548)	-0.0133	(0.0467)
Invention: Yes	-0.207***	(0.0736)	0.0938*	(0.0499)
Institutional factors				
No significant effects				
Pseudo R-squared	0.183		0.102	
Log-Likelihood	-112.7		-116.9	
Observations	233		282	

Notes: Robust Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Because of reasons of space we report only effects which are significant in at least one of both regression models. Each regression model includes all independent variables.

Regarding the probability to already having started their venture between the both waves of our survey only a few significant effects are found. Female academics have a lower probability to already having started their business within the three year period. The opposite is true for academics with high risk-taking propensity. A higher risk-taking propensity increases the likelihood for having already started the venture in the three-year period. Academics in the field of STEM have a lower probability to already having started their venture. In contrast scientists who have already generated an invention in the first wave are found to be more likely to have started their business until the second wave was conducted. Regarding institutional factors we do not find any significant effect, neither in the model of becoming a quitter nor in the model for entrepreneurs.

DISCUSSION AND IMPLICATIONS

With our unique panel design, this study is the first to our knowledge using representative data of the German academic landscape to simultaneously test the effects of individual, job-related, and institutional conditions on the academics' entrepreneurial trajectories while providing a holistic and longitudinal perspective.

The motivation to start a business is relevant for pursuing own business ideas. So called pull factors like individual fulfilment, practical orientation and work-life-balance are important to prevent researchers from giving up their business plans. But they have no influence on the probability to already having started their venture within the period of three years between both waves of our survey. In contrast so called push factors have no influence on the progress of business ideas of

researchers with entrepreneurial intention. Another important factor is the generation of an invention. It reduces the risk of becoming a quitter and promotes starting the own business. Inventions are often developed by researchers being active in STEM-fields. Hence, scientists of STEM-fields should be more in the focus of entrepreneurial support structures to help them attain the knowledge and conviction to start a business.

Summing up, we were able to show that the groups of academics which stopped the entrepreneurial intentions (quitters) and those which already founded their business (entrepreneurs) were influenced differently by the determinants under consideration. Especially for policy makers who invest into programmes and infrastructure supporting a positive entrepreneurship climate at German institutions of higher education it is of importance that those interested in becoming an entrepreneur will not end being a "quitter" and those already being an entrepreneur are willing to carry on.

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