Findings from 20 years of business plan competitions in North-Bavaria

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Abstract: This study investigates the role of successful participation in a business plan competition in determining the future success of start-ups. Among 61 organisations that participated in the Business Plan Competition North-Bavaria from 1999 to 2018, 11 firms were among the top three winners and met the criteria of this research. A questionnaire was developed and pilot-tested for data collection and analysis. The inferential part of the study results indicates that there is no statistically significant association between success in the competition and future success of the start-up. Contrary to this result, the demographics support the positive contribution of the competition in terms of networking and feedback as perceived by the participants. Future research may consider similar competitions worldwide and examine various competition approaches, investigate demographic influences like team diversity, and include underperforming companies in business plan competitions that could potentially turn out to be successful.

Keywords: start-up; business plan; competition; nascent entrepreneurs; Bavaria; Franconia.

Reference to this paper should be made as follows: Kiesel, S. and Harkiolakis, N. (2021) "Findings from 20 years of business plan competitions in North-Bavaria", Int. J. Teaching and Case Studies, Vol. 12, No. 1, pp.42–62.

Biographical notes: Simon Kiesel holds a German business degree, a Bachelor’s degree from The Open University, a Master’s degree from the University of South-Wales and published this paper in partial fulfilment for the Executive Doctorate of Business Administration degree at Ecole Nationale des Ponts et Chaussées. In 2020, he was awarded by the IMA Educational Case Journal with the third place in a case writing competition. He works as the Head of Marketing for a German publishing company with various digital services. He is a volunteer judge for the Business Plan Competition of Northern Bavaria, and a consultant and coach for startups.
1 Introduction

Entrepreneurship plays a central role in the economic development of a society (Stuetzer et al., 2012). Although the general entrepreneurial rate in Germany (new corporations in relation to the number of employees) is currently declining slightly (Zinke and Richter, 2018), more and more young people decide to choose an entrepreneurship career instead of becoming employees. Current studies show that 57% of German students can imagine starting their own business instead of taking a corporate job (Koch and Wegmann, 2016).

Considering two-thirds of all new venture attempts are discontinued during the start-up creation process, Stuetzer et al. (2012, p.186) emphasise the importance of better understanding the progress of start-up projects and its determining factors. One difficulty is recognising possible realisability at an early stage. This is important for investors and other stakeholders. However, while on the one hand the novelty of an innovative start-up idea creates new market opportunities, on the other hand, novelty is inherently associated with uncertainty [Scott et al., (2016), p.2]. Davidsson (2015) states that the emerging trend towards entrepreneurship has led to a shift in the focus of scientific activities on entrepreneurship to the very early development stages of new ventures. Furthermore, he argues that research in the field of entrepreneurship can make its clearest contributions to the broader areas of economic and organisational research [Davidsson, (2015), p.135].

Regarding official statistics of registered companies and their liquidation, from sources such as the Bureau of Labour Statistics in the USA, Industry Canada, or credit rating agencies, the survival rate of new businesses within the first and second years of their operation is much higher (Jarvis, 2015). However, the official statistics also include many spin-offs from existing large companies (e.g., administrative corporates) as well as start-ups in the small-scale trade (e.g., craft enterprises, restaurants). To avoid any misunderstandings, start-ups are defined for this study as companies that are less than ten years old, based on an innovative technology or innovative business model and geared to significant growth. These proposed elements are in line with the definition of the German Startups Association (Kollmann et al., 2017).

The difficulty in measuring a conversion rate for a plan to become a business is that many business ideas do not appear in public records at the time of submitting a concept in a competition. Thus, most start-ups are not formally founded in this early stage. Especially during the early conception phase of start-ups, Kessler and Frank (2009, p.721) confirm that public data is not well suited for analysing the creation process of new ventures. As long as a corporation has not been registered in Germany, most of these
companies are constituted under civil law which can be resolved at any time, without reason, and without reporting to any authorities. Schwartz et al. (2013, p.1580) list several studies and suggest that of all persons who have taken the first steps in the process of starting a new business, actually 33% to 58% complete the transition to a full-fledged entrepreneur within a year.

Writing a business plan is a global practice (Rusko et al., 2017) and common technique to describe the business opportunity and summarise milestones in a road map during the first years of a business start-up (Lange et al., 2007). It also provides the basis for both internal communication (for example, binding agreements on objectives for employees) as well as external communication to convince private or public investors such as banks, venture capitalists, business angels, or cooperation partners that decide on the release of funds (Maack et al., 2011).

 Being selected as the winner of a start-up competition (SUC) may be one source for assessing the potential of a start-up project, as the confidence of the competition committee in the underlying business concept also sends a signal to future stakeholders [Schwartz et al., (2013), p.1582]. Schwartz et al. in 2013 identified 71 competitions in Germany, which was the largest number in Europe at that time. Another study even listed 141 start-up and business plan competitions for 2016 (Zinke and Richter, 2018). However, their findings could “not tell much about the effectiveness of SUCs as a policy measure aimed at facilitating the entrepreneurial process” [Schwartz et al., (2013), p.1592].

After more than 25 years of experience with business plan competitions (BPC), Maack et al. (2011, p.153) also saw the need to critically evaluate the objectives, structure and functioning, results for students, teachers and society resulting from the BPC concept. Other researchers deliberately pointed to a gap in the literature, according to which there are very few empirical indications to support a link between earlier business planning and increased final performance [Elly et al., (2016), p.239]. Furthermore, the investigation if the original participation at a competition was helpful for the further development of the venture (over a long-term period) might be relevant since “there is little knowledge about the value-added of SUCs from the perspective of their participants” [Schwartz et al., (2013), p.1592].

The specific problem this research will address is lack of understanding of the relationship between success in BPCs and subsequent start-up success (McKenzie and Sansone, 2019; Tipu, 2019; Watson and McGowan, 2019; Watson et al., 2018). In alignment with this problem statement, the purpose of this quantitative exploratory study is to provide an understanding of the relationship between success in BPCs and subsequent start-up success.

The findings of this study could have implications for venture capitalists and other stakeholders in dealing with start-ups in an early-stage founding phase.

The following research question has been developed for the purposes of this study:

**RQ** Is there a statistically significant correlation between start-up performance in a business plan competition and their subsequent market success?
2 Literature review

According to the diffusion of innovation theory (DoI), innovations evolve while they are spread among a community (Maack et al., 2011). Hence, for Maack et al. (2011), a business plan competition represents a social ecosystem that communicates knowledge, gives feedback to business ideas, and commercialises technologies. The diffusion theory was developed by Gabriel Tarde, a sociologist who studied the process of how new machineries were introduced at the beginning of the 20th century (1903) and how the economic foundation of societies changed due to such new technologies [Maack et al., (2011), p.144].

Business clusters can provide a framework in which companies can transfer information and can set up marketplaces. Alfred Marshall was the first to describe a business cluster theory in the 1920s (Maack et al., 2011). Schumpeter further developed the idea of clusters by arguing that innovations tend to appear in groups (Schumpeter, 1943).

Penrose’s theory from 1959 of the growth of a firm considered not only typical resources such as labour, land, and capital but also intangible resources like knowledge (Kor et al., 2016). When she suggested that company founders should rely on external services, advice, and consultants to improve their organisation, test markets, and discuss ways to expand [as cited in Kor et al., (2016), p.1742], Penrose anticipated the concept of a business plan competition.

Later theories, like Porter’s model of five competitive forces (Porter, 1980), arranged clusters into competitive strategies. Wernerfelt (1984) defined resources as all aspects that could lead to strength or weakness for the company. Taking advantage of a network and tips in a business plan competition could be considered as Wernerfelt’s resource position barriers in analogy to entry barriers.

Harkiolakis (2014, p.8) described the evolution towards a multipreneur with several stages (specialist, generalist, manager, leader) that are also based on the expansion of somebody’s network, including people and organisations in the market. This can be seen as a link to a business plan competition, while Harkiolakis emphasised the individually influenceable entrepreneurial network, as the space within every actively engaged individual and every resource of the business world can be physically and conceptually connected [Harkiolakis, (2014), p.9]. The connection becomes even more evident when Harkiolakis indicated that connecting nodes can be dynamically created or removed as the entrepreneur formulates ideas and establishes relationships with other entities and resources (2014, p.9). Participating in a business plan competition could be interpreted as creating a hub [Harkiolakis, (2014), p.28] and building social capital by many connections to other stakeholders such as other start-ups, entrepreneurs, business angels, or venture capitalists. Likewise, Groth et al. (2015, p.265) highlighted that entrepreneurs require a variety of factors such as talent, knowledge and intellectual property (IP), capital, but also credibility with various stakeholders including governments, corporations, other start-ups, private equity, laboratories, or universities.

Businesses fail much faster today than they did in the past (Govindarajan and Srivastava, 2016). This observation was confirmed by recent studies that examined the survivability of companies. Those launched on the US market before 1970 had a 92% chance of surviving the next five years. For those established between 2000 and 2009, there was only a 63% chance, although the researchers adjusted their findings for the impact of the collapsed internet bubble and the 2008 financial crisis. One reason is that
today’s start-ups, in percentage terms, spend twice as much money on their organisational capital as older companies. On the one hand, new business models, such as digital services, can be started and scaled very quickly. They do not need capital-intensive production capacities and can quickly adapt their business model to market changes. On the other hand, digital companies are easy to replicate and therefore vulnerable to imitation (Govindarajan and Srivastava, 2016).

While multinationals within innovation clusters can mobilise multiple resources (O’Dwyer et al., 2015), start-up companies face major challenges regarding financing, legal, bureaucratic start-up formalities, staffing and space, building technical infrastructure, supplier relationships, access to markets, and marketing support. As a result, they are heavily dependent on external support, especially in their initial phases (Heilman et al., 2015).

Particularly young founders who come from the university environment use in Germany a popular state funding program called EXIST (Kulicke and Kripp, 2013). The prerequisite for applying for funding in this program is an innovative technology-oriented and knowledge-based start-up project proposed by students, graduates, and scientists (Kulicke and Kripp, 2013). Full-time founders are supported financially in the start-up preparation by grants for a maximum of one year and various advisory and support services. From 752 different projects that received EXIST founder scholarships from the years 2007 to 2011, 65% had founded and survived until 2013. However, founding and survival were not further defined, for example, to the registration of a limited liability company. Rather, the study primarily related to secondary data (e.g., website activities), which meant that even ideas that remained in project status were considered a success. More than half of the companies had less than five employees, and 83% of the companies had sales of less than 0.5 million euros (Kulicke and Kripp, 2013).

Analysing 1,098 tech companies that raised their first seed investment in 2008–2010, CBInsight (2017, p.1) could deduce that less than half of the start-ups (46%) managed to get funding in a second round. In the further course of time, till 2017, more than 70% of the start-ups either failed to exit (sale of the start-up) or to obtain follow-up financing in the venture capital (VC) process. While not all of these companies were liquidated (some became self-sustaining), a scalable growth as a prerequisite for a successful start-up and incentive for first-round investors could not be realised. Mergers and acquisitions, as well as exits, were considered and represented the majority of the remaining companies (28%). Less than 1% (0.91%) of the selected companies reached the unicorn stage with an enterprise value of $1B+, including Airbnb, Slack, and Uber (CBInsight, 2017).

The concept of start-up competitions (SUC) or business plan competitions (BPC) appeared in the 1980s in the US within entrepreneurial academic cluster environments (Maack et al., 2011). One of the oldest and largest competitions is the MIT $100k entrepreneurship competition. It was established in 1990, is student-managed, and is aimed at teams from the Massachusetts Institute of Technology (Maack et al., 2011). Whereas in the 1990s, at the beginning of competitions, a written business plan of several pages was usually expected, some of the competitions shifted their focus more on presentations. The Elevator Competition at Wake Forest University, first held in 2000, encouraged participants to compress their business idea to a maximum of 90 seconds (Hofer, 2016).

Hofer (2016, p.146) highlighted two main purposes of a business plan, first, to formalise the thoughts around the new company to be founded, and second, to bundle information to convince potential investors. Whereas other researchers also saw the
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opportunity for internal agreement on objectives and to convince cooperation partners within a social ecosystem like key accounts and big suppliers (Maack et al., 2011). Sharing business secrets and ideas at an early stage, in general, appeared to have a positive influence on entrepreneurship development (Balachandra and Briggs, 2009).

Researchers investigated many factors that could influence the question of who drops out from becoming an entrepreneur. Thus, various studies (Davidsson, 2015; Stuetzer et al., 2012) have investigated a connection with socio-demographic factors, for example, Stuetzer et al. (2012) were able to confirm Lazear’s jack-of-all-trades theory (Lazear, 2004), which suggests generalists rather than specialists as more successful entrepreneurs. According to Lazear (2004), a balanced skillset seems to be one crucial factor.

Furthermore, team diversity in business plan competitions (Foo et al., 2005) or their value in learning business concepts in an academic setting (Maack et al., 2011) were investigated. Focusing more on a macro level instead of individuals, other studies also found indicators such as the environment, resources, and founding processes that had an impact on the decision to start business activities (Kessler and Frank, 2009).

The regional factor was also analysed by several scholars to explain the different innovative strength of particular geographic areas. For example, Amorós et al. (2013) compared entrepreneurial opportunities in rural versus urban geographic regions. Regional innovation clusters and their success were analysed in several countries: e.g., for Scotland (Brown et al., 2016), England (He et al., 2014), Germany (Fritsch and Wyrwich, 2014), Japan (Ibata-Arens, 2008), Morocco (Kabbaj et al., 2016), and compared with the entrepreneurial model in Silicon Valley (Engel, 2015). Supra-regional initiatives such as business plan competitions make it possible to exchange, network, and start a venture, even if the hometown conditions may not be optimal. Given a very high proportion of small companies in developing countries (99.6% percent in Nigeria with less than ten employees), McKenzie (2017) investigated how business plan competitions can contribute to high-growth entrepreneurship. Start-ups that won a competition, three years later had a 37% higher chance to survive. Also, the probability that the company had ten or more employees was 23% higher than the control group of the study [McKenzie, (2017), p.2279].

While some researchers (Fritsch and Wyrwich, 2014; He et al., 2014) emphasised qualifications, right time and place, market opportunities and the ability to see advantages as substantials that create entrepreneurship, Harkiolakis suggested that these attributes primarily influence the size and scope of the entrepreneurial enterprise, not its appearance [Harkiolakis, (2014), p.5]. Entrepreneurial activity is much more driven by personalities and would also take place under harsh conditions. Nevertheless, he, too, admitted that the overall economic success without appropriate framework conditions would have been certainly smaller than with them.

Some researchers also pointed out that former ‘start-up’ companies like Microsoft, Dell, Apple, or Google never had a business plan and became very successful (Lange et al., 2007). They noted that the preparation of a business plan before the start of operations made no difference in terms of subsequent turnover, net profit and number of employees and came to the conclusion that it is not necessary for entrepreneurs as long as they do not have to rely on external money [Lange et al., (2007), p.239]. Companies without a formal plan can build on savings from friends and family (‘bootstrapping’). However, first, the study only examined successful operating companies and cannot tell anything about the first stage level of business ideas. Second, in this case, too, different
definitions of start-ups may come up against each other. To achieve correspondingly rapid growth, investors and debt financing are becoming increasingly important (Zinke and Richter, 2018), and have been for the above examples like Google or Apple. Young technology-oriented companies usually have little opportunity to finance from cash flow funds. Therefore, start-ups are primarily dependent on capital from external venture capitalists (Zinke and Richter, 2018). However, Lange et al. (2007, p.251) confirmed this thesis through their study, recognising that founders who wrote a business plan raised considerably more capital. Though, even Lange et al. (2007), who support the ‘just do it’ approach, think that business plans are relevant for strategic partners as well and advise ventures to have at least a financial projection. Nevertheless, with the lean startup (TLS) method (Ries, 2011) or new models such as the business model canvas (Osterwalder and Pigneur, 2011), instead of a multi-page business plan, there are approaches to react to current events and adapt the company flexibly. Frederiksen and Brem (2017) dissected Ries’ non-scientifically written book on TLS and discussed the two entrepreneurship approaches planning versus doing [Frederiksen and Brem, (2017), p.179]. However, although they found research-proven sources for the TLS method, they highlighted that entrepreneurs do not act in an unlimited solution space. Hence, extend of their capabilities is limited, and paths in between these boundaries can be planned.

Scott et al. (2016) were the first to analyse at Harvard Business School whether one can predict a start-up’s success only based on the concept. In their working paper, they discovered that the observed quality of a business plan predicts success for research and development-intensive (R&D) sectors such as life sciences, medical devices, hardware, or energy. However, for some other, less R&D-intensive sectors like software and consumer products, they were not able to identify significant relationships. The dataset contained 652 ventures that participated at the MIT’s venture mentoring service between 2005 and 2012. This was not a business plan competition but a standardised summary of the proposed business start-up idea, the business model, the technology stack, target customers, challenges, and information about the founding team for potential mentors [Scott et al., (2016), p.2]. Deciding whether to work with a start-up, mentors had to build on the strength of the business plan alone. The success of the ventures was measured regarding the commercialisation, whether the start-up launched a service or product with repeatable sales. Overall, 22% of the start-ups did. Looking at top performers that received a mentor evaluation above average, these had a 24% higher chance to be successfully commercialised (Scott et al., 2016). The results suggested for start-ups that cannot shine with intellectual property (such as a patent-protected technology) or operate in markets with low entry costs (such as software) to focus on other strengths in a business concept. Early sales with customers or a high diversity within the founding team could better convince mentors or jurors. To question is the definition of success in Scott’s study, which refers only to publicly available information on the survival of the company and offered products.

Because of the characteristics and its relevance to the research question, the theoretical framework for this study is based on the model of Chwolka and Raith (2012). The evaluation of good and bad business ideas forms a value of planning before market entry (Chwolka and Raith, 2012). Their formal decision-theoretical framework was adopted for this research and depicted in Figure 1. Nevertheless, Chwolka and Raith (2012) emphasised that entrepreneurs, like all decision-makers, are limited to information, knowledge about alternatives, future consequences, and that they use
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heuristics and choose satisfactory alternatives instead of optimising techniques and complicated choices.

Figure 1 Tree structure model for the business plan competition

3 Methods

A cross-sectional, non-experimental, correlational research design was chosen for this study to establish relationships between the success in a business plan competition and the following success of the real business. Because relationships between variables should be examined, a quantitative method was selected to address the research questions and hypotheses of this study (Harkiolakis, 2017). The population included 61 companies that won the Business Plan Competition North-Bavaria until 2018 out of more than 2,755 start-up teams that took part since 1999, the first year of the competition (Rudolph, 2018). The distribution among the northern Bavarian administrative districts was as follows: Central Franconia (1,307), Upper Franconia (511), Lower Franconia (474), Upper Palatinate (463) [Rudolph, (2018), p.11]. The sample for this research was all top three performers of the competition.

The main hypotheses were:

H0 There is no statistically significant correlation between companies that were top performers in a business plan competition and their future success.

H1 There is a statistically significant correlation between companies that were top performers in a business plan competition and their future success.

Based on the literature review, and the theoretical frame of this study, its research question, and hypothesis, a questionnaire was developed to serve as the instrument for data collection.

The questionnaire was structured into two sections, a demographics section and a subject matter section. The demographics questions (like number of founders, gender, work experience and specialisation) were aimed to identify potential demographic influences on the subject-matter questions. Previous studies (Foo et al., 2005; Stuetzer et al., 2012) found out that team diversity and team size can influence the success of business ventures. The selection of professional specialisations was inspired by the work of Stuetzer et al. (2012), supplemented by the IT area not listed there. The last question about the position of the interviewee in the third year of foundation ensured that the questionnaire was answered by the founder himself or an executive.

The main question aimed at establishing the success level of the enterprise, which was one of the variables involved in the research question of this study. To ensure comparability, a baseline of three years after foundation was considered for the actual
evaluation of success or failure. A five-point Likert scale was used for all opinion style questions (strongly disagree, disagree, neither agree nor disagree, agree, strongly agree).

Furthermore, the founders were asked about the contribution of the business plan competition to the success of their start-up. The question aimed at confirming findings (Hofer, 2016; McKenzie, 2017) that planning leads to success. External business development support by stakeholders had been identified as a factor influencing start-up success (Heilman et al., 2015). Hence, another question evaluated factors that were part of the competition process and might have contributed to the third-year status and to discover whether there was a correlation between start-up performance in a business plan competition and the subsequent market success. An open-ended question captured other potential factors that might have been missed.

An initial draft of the questionnaire was reviewed for validity (content, structure, and form) by two professors as quantitative research methodology experts. The revised version of the questionnaire was pilot-tested to a sample of ten participants to get feedback concerning its structure and content. The results of the pilot study showed no ambiguities or missing aspects for the purpose of the research. A web-based form of the questionnaire was developed using Google Forms, and an invitation to participate was sent to the population of the remaining founders and senior executives. The founders and senior executives were contacted by e-mail and received a web-based questionnaire.

Moreover, official public sources such as the commercial register in Germany were used as were the websites of the companies themselves, postings on social media, and the monitoring of media sources such as newspaper articles to determine if a company was still operational.

The software IBM SPSS Statistics (version 27) was used for the analysis of the collected information, performing descriptive, and inferential statistics. Ordinal variables that used the Likert scale were treated as scale. Likert scales are often used to measure settings that provide a range of answers to a particular question or explanation. It is assumed here that categories of the Likert type represent a measure at the interval level. Although the interval character of individual items has been discussed in the literature, it is generally accepted that the summed scale value can still be of the interval type, as the sum may be insensitive to the violation of the interval assumption at item level (Jamieson, 2004; Knapp, 1990; Leung, 2011). In addition to normality tests with the Shapiro-Wilk and the Kolmogorov-Smirnov examination, a visual inspection of the P-P and Q-Q plots was also performed. For descriptive statistics, the mean, median and standard deviation of the scale and ordinal variables were then calculated, while for the nominal variables, frequencies and their distributions were considered. To identify potential relationships between scale variables, bivariate correlations were conducted for the inferential part of the analysis. For the normally distributed ones, Pearson’s r was calculated, while for the non-parametric ones Spearman’s ρ was considered. In addition, chi-square tests for nominal and ordinal variables were used to identify potential associations.

4 Results

The data collection process lasted from June 2020 until July 2020. Out of 61 companies that won the top-3 places in the competition from 1999 till 2018 (in one year there were two third places), the secondary data analysis resulted in 17 companies that were no
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longer active and were deleted from the commercial register. These companies were considered unsuccessful. Seven of the remaining companies had been sold by the founders and no original founder was on the board anymore. However, because the original business idea, the product, and in some cases even the original brand name were maintained, these companies were considered successful but were not considered in this research as the original founders were not part of them anymore.

Among the 37 remaining companies that were still active, and run by the original founders, 26 completed the questionnaire resulting in a sample that represented 70% of the population. However, it turned out that for 15 companies, their year of foundation, which was listed in the commercial register, preceded the competition award and, in that sense, they did not meet the criteria of this research. Hence, the remaining 11 cases were considered to fulfil the research criteria and formed the sample for analysis representing 30% of the population.

Despite the small sample size, normality tests were performed using the Kolmogorov-Smirnov and Shapiro-Wilk test and further complemented by visual inspection of the Q-Q plots. Seven of the variables (Useful_Experience, Useful_Funding, Useful_Networking, Useful_PrizeMoney, Useful_Publicity, NumFounders and NumMaleFounders) were classified as normal, while all other scale variables were assumed non-parametric. Log10 and SQRT transformations, used to determine if any of the other variables could be treated as normal, did not change the status of the variables.

Descriptive statistics (Table 1) show the means and the medians for all scale and ordinal variables. For the entire group, the mean founding date was 0.64 years after the competition, suggesting most start-ups might have already been in the process of being created with little influence from the results of the competition. All companies finished the business plan competition with one of the first three places. However, the mean final place was 2.27.

Regarding the business sector, 36% of the start-ups came from technology, 57% of the companies were equally divided between life-science and information and communication industry while the remaining 9% belonged to the service sector. The bias of the sample towards tech-related industries was clearly evident. Expertise-wise, 73% of the founding team’s professional specialisation was in engineering and research and development, 64% had experience with production and project management and 36% with IT. With respect to organisational divisions, only 18% of the founders had Human Resources background while 27% had expertise in accounting, controlling, and financing as well as marketing and sales.

The number of founders ranged from 1 to 4, while female members were the minority on the founding team. Only 36% of the companies had one female founder on the board, whereby the female representation never made up more than half of the founders, even in these mixed-gender start-ups. A clear bias towards male founders was evident in the sample population.

Data were analysed with the computer software SPSS and all ordinal variables were considered as non-parametric. The subjective success classification ranged from 1 (strongly disagree) to 5 (strongly agree). On average, the entrepreneurs were successful with their start-up (mean = 4.0 or ‘agree’), indicating that their winning position in the competitive was somehow reflective of their future success. In retrospect, 73% of the analysed companies’ founders believed the business plan competition contributed to the success of the start-up and helped in the further development of their business.
Regarding the various components of the business plan competition that were of value during the first three years of the start-up’s operations, a mixed picture emerged. Feedback and recommendations from jurors and experts in the business plan competition as well as the planning approach experience, thinking through the business idea thoroughly and for years to come, were considered to be valuable by the great majority (73% voted ‘agree’ or ‘strongly agree’) of the participants. Seminars and preparation courses as well as gathering experience in the presentation of the venture also achieved a high level of support (64%). In contrast, only slightly more than half of the start-ups (55%) agreed or strongly agreed that financial support from funding sources, the prize money for one of the first places, or the publicity effect of winning the competition were helpful.

The usefulness of creating a network within the framework of the competition events was not strongly supported (only 36% agreed). However, those few start-ups (n = 4) that were able to benefit from networking at the competition events, e.g., at the award ceremonies of the three phases, also rated the overall contribution of the competition to the further success of their company higher than the rest (n = 7) of the companies (mean 4.8 versus mean 3.7 for the competition contributed to success variable). A similar positive correlation (mean 4.4 versus mean 3.5 for the competition contributed to success variable) was found for those groups that agreed or strongly agreed with gathering experience in the presentation of the venture (n = 7). The same applied (mean 4.5 versus mean 3.6 for the competition contributed to success variable) to the group that was obviously able to derive financial support from the competition (n = 6).

To identify potential demographic influences of the sample, a cross-tabulation was performed between the aforementioned demographic variables. Businesses that had at least one woman in a founding team outperformed those with pure male founders with

Table 1  Details about the analysed start-ups

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>Std. dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Founding year</td>
<td>0.6</td>
<td>0</td>
<td>1.2</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Final place</td>
<td>2.3</td>
<td>3.0</td>
<td>0.9</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Successful in real life</td>
<td>4.0</td>
<td>4.0</td>
<td>0.8</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Competition contributed to success</td>
<td>4.1</td>
<td>4.0</td>
<td>0.8</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Useful seminars</td>
<td>3.6</td>
<td>4.0</td>
<td>1.1</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Useful feedback</td>
<td>4.1</td>
<td>4.0</td>
<td>0.8</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Useful experience</td>
<td>4.0</td>
<td>4.0</td>
<td>1.0</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Useful funding</td>
<td>3.3</td>
<td>4.0</td>
<td>1.4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Useful networking</td>
<td>3.2</td>
<td>3.0</td>
<td>1.2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Useful presentation experience</td>
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regard to the start-up’s success. Interestingly, the success rate of companies with pure male founders was reported slightly lower (mean for success variable = 3.7) than that of mixed teams (mean of success variable = 4.5). While mixed teams that had female founders on the board outperformed those with pure male founders with regard to the start-up’s success, the size of the team itself had no influence. Moreover, teams with three or more expertise fields performed better. On the one hand, this result is in line with previous findings (Foo et al., 2005; Stuetzer et al., 2012) that team diversity increased the success of business ventures. On the other hand, it contradicts findings on the same development in team size (Foo et al., 2005).

Gender-mixed teams also showed a higher number of different skills in the team. And the teams with three or more of the six queried expertise fields showed greater success in real life (mean for success variable = 4.4) than the teams with only one or two skills (mean for success variable = 3.7). Further research will be required to shed light on this observation. The size of the team itself, however, had no influence on the success. Both founder teams with one or two people, as well as teams with three or four people, considered themselves equally successful three years later.

Furthermore, an association was observed between the industry sector and start-up success. Because of ordinal data and an assumed linearity, the Pearson chi-square test was used to analyse nominal and non-parametric variables. Figure 2 shows the industry had a statistically significant relationship at the 5% level. According to Harkiolakis (2017), a correlation of 0.3 means a moderate effect. Start-up companies from the telecom \((n = 3)\) and life science sector \((n = 3)\) were significantly more successful than those from the technology sector \((n = 4)\).

**Figure 2** Pearson chi-square and bar chart for successful * industry (see online version for colours)

Regarding the contribution of the business plan competition to the future success of the start-ups, the result of the study showed a clear positive correlation between the two variables. In this context, it is interesting to note that the less successful technology population of the sample \((n = 4)\) in particular considered the planning approach experience to be less helpful. Figure 3 shows a significant correlation between the industry and the experience of the competition in planning business for the coming years.
Spearman’s Rho correlations (Table 2) were conducted to quantify associations between the non-parametric variables. The results revealed correlations at 0.05 level (2-tailed) of significance between the success of the start-up in real life and the usefulness of seminars ($r_s = .620, p = .042, n = 11$). Start-ups that found the offer of preparatory seminars and courses useful were more often successful in real life. The same applied to startups that were able to find sources of financing ($r_s = .686, p = .020, n = 11$) during the competition or welcomed the planning approach experience of a business plan ($r_s = .675, p = .023, n = 11$).

Furthermore, Spearman’s rho correlations showed a significant correlation at 0.05 level (2-tailed) between the usefulness of the competition in general and the usefulness to create a network ($r_s = .705, p = .015, n = 11$), gathering experience in the presentation ($r_s = .618, p = .043, n = 11$) of the venture, and the consideration of financial support from funding sources ($r_s = .636, p = .035, n = 11$) of the venture. A week positive correlation was observed between the usefulness of the competition in general and the usefulness of feedback and recommendations from jurors and experts in the competition ($r_s = .750, p = .008, n = 11$).

The planning approach experience of a business plan, thinking through the business idea thoroughly and for years to come, was rated less useful by the founders of those companies that had a greater difference between the competition year and the year of foundation than those that were founded in the same year ($r_s = –.712, p = .014, n = 11$).

Presumably, the conditions for a foundation had already changed a few years later, which is why the original plan was considered less helpful by the founders.

Regarding the hypothesis of the study, a one-sample chi-square test was conducted to check the distribution of the future success against the equal distribution among all possible outcomes. The results (Figure 4) revealed no statistically significant differences at the 0.05 level. Based on this result, the null hypothesis cannot be rejected.

Hence, the findings cannot support the rejection of H0, suggesting there is no statistically significant correlation between companies that were top performers in a business plan competition and their future success. The findings therefore do not support the belief that public policy in the form of a business plan competition can help identify potential high-growth entrepreneurs and that a detailed and long-term planning strategy leads to success (McKenzie, 2017) rather than a ‘just-do-it’ approach (Frederiksen and Brem, 2017) when building a company.
## Findings from 20 years of business plan competitions in North-Bavaria

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Notes: *Correlation is significant at the 0.05 level (2-tailed).
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Notes: *Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).
With respect to the research question of this study, the results of the inferential part of the statistical analysis suggest that there is no significant correlation between future performance of start-ups that topped a business plan competition before their establishment.

This contradicts the general impression provided by the demographic part of the analysis where a positive relationship between the two was supported as per the values of the median and mode.

However, the findings regarding a positive influence of the business plan competition on the sample population of this study suggest that differences in success, depending on the industry sector, could be explained with the findings of Scott et al. (2016), who discovered that the observed quality of a business plan predicted success for research and development-intensive (R&D) sectors better than for fewer R&D-intensive sectors.

5 Discussion

5.1 Implications for theory

Regarding the theoretical framework of this study, the findings cannot support the success-positive branch in the tree structure model for the business plan competition (Figure 1). The study found that in this case, it was not possible to use business plans of start-ups in an early stage setting to predict their future success. Due to the limited amount of data points, this result weakly contradicts findings from similar investigations that considered mentoring programs, incubators, etc. (Scott et al., 2016). While the findings do not prove a strong association between future success and success in business plan competitions, they do however indicate a strong positive influence that business plan competitions have on future success.

Furthermore, the results suggest a modification of the theoretical framework with the addition of the demographic influencing factor of team diversity increased as contributing to the success of business ventures. Similar studies support this finding (Foo et al., 2005; Stuetzer et al., 2012). While some researchers did not consider the demographics of the founding teams (Scott et al., 2016) as part of the start-up business plan scoring, this was not the case for the Business Plan Competition North-Bavaria, so gender diversity was part of the demographics section in the questionnaire of this research. Contrary to past studies, the present study also considered the initial capital of start-ups, and it appeared that it is a significant factor in the future success of a start-up.
5.2 Implications for practice

Start-ups typically emerge with an idea or a prototype, a small team of employees, with few sales and customers, if any. This initial status makes it difficult to assess their potential for success and growth for investors, but also for suppliers, potential customers, the government, or institutions such as the chamber of commerce and industry. Existing organisations take the risk of working with new companies and investing money, time, and resources. This study has shown that business plans that have gone through a multi-level, demanding competition and are among the top performers are not automatically successful in real life. This calls into question the predictive power of competitions as a tool for promoting entrepreneurship.

With respect to the financial support, visibility, and networking aspects of the Business Plan Competition North-Bavaria, they seemed to be of lower added value during the first three years of operations. In this respect, organisers of such competitions could do more to support its participants. Companies in the technology sector may also need more support than start-ups from other industries. The significantly lower performance of technology start-ups could be improved by promoting patent applications, technical tests and certifications, and by the incorporation of engineers with specific business management skills in their teams. Further research would need to be carried out to validate these results and provide insights.

5.3 Limitations and directions for future research

A significant limitation of the current study is the relatively low sample size of 11 organisations. Future research with more data points, either from future competitions in Bavaria or even worldwide, will be necessary to confirm the findings of this study.

Furthermore, the results are limited to the geographic focus, evaluation criteria, and specificity of the Bavarian business plan competition. Although business plans are a significant factor in the future success of a start-up, there may be other methods of evaluating a start-up company (e.g., by other start-ups, by the public in crowdfunding initiatives, etc.). Future research may examine various competition evaluation schemes and approaches.

Another limitation of this study is the subjective nature of success of a start-up since it was based on the founders’ perceptions of success. There is a strong possibility that entrepreneurs at every stage of enterprise development are biased toward the success of their business that they ‘strongly agree’ with its success, even if they are close to bankruptcy. Conclusively, focusing on the earliest phase of a start-up’s life may be a limitation in terms of generalisation with regard to later-stage success.

A possibility also exists of a bias between the judges’ evaluation and the subsequent success of start-ups (Schwartz et al., 2013), although the nature of the Business Plan Competition North-Bavaria controlled for a possible self-fulfilling prophecy that jurors might rate the companies that they support, for example, as a business angel higher in the competition. Schwartz et al. (2013) emphasised a systematic selection bias. Because the identification of hopeful business concepts is based on comprehensive criteria, “SUCs are likely to support those nascent projects which would be able to complete the entrepreneurial process even without receiving such support” [Schwartz et al., (2013), p.1592].
Although the setting of the study only allowed the analysis of the top performers of a business plan competition, it might be of interest if future research could consider start-ups that their business plans received low evaluations. Analysing underperforming companies in competitions in future studies, or even comparing the results with start-ups that had no business plan at all, can provide insights about the contribution of competitions to the success or failure of start-ups.

6 Conclusions

There is still little evidence of the effectiveness of business plan competitions in predicting the success of a start-up. This paper contributes to the literature as a study focusing on entrepreneurs who aim to introduce an innovative product or service to the market and thus grow rapidly. It is also the first of its kind to evaluate success through a direct assessment, with success being questioned three years after the company’s foundation using a subjective scale, and not just based on secondary data such as turnover and employee numbers. Nevertheless, the study was not able to confirm that competitions can be regarded as early indicators and that the results of competitions can predict future success of a venture.

Government decision makers and institutions should feel encouraged to reflect on other approaches and instruments of start-up evaluation and support. Academic research can provide further insight into the value of business plan competitions and the ways in which they support start-up founders in their future success.

References


Findings from 20 years of business plan competitions in North-Bavaria


