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Published in:

International Journal of Business and Management (IJBM)

DOI:

[10.5539/ijbm.v17n5p1](https://doi.org/10.5539/ijbm.v17n5p1)

Publication date:

2022

Document Version

Publisher's PDF, also known as Version of record

[Link to publication](#)

Citation for published version (APA):

Schumacher, N. (2022). The German Venture Investors' Perspective on Success Factors of Digital Start-ups: A Mixed-Methods Approach. *International Journal of Business and Management (IJBM)*, 17(5), 1-12.
<https://doi.org/10.5539/ijbm.v17n5p1>

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The German Venture Investors' Perspective on Success Factors of Digital Start-ups: A Mixed-Methods Approach

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Received: January 20, 2022

Accepted: February 17, 2022

Online Published: April 5, 2022

doi:10.5539/ijbm.v17n5p1

URL: <https://doi.org/10.5539/ijbm.v17n5p1>

Abstract

This study examines the perspective of German venture investors on the success factors of digital start-ups at the micro- (entrepreneurial personality), macro- (contextual factors), and meso- (business model) levels and derives an integrated, evidence-based working model of entrepreneurial success. This study follows a mixed-methods design, using theory-driven semi-structured expert interviews to collect quantitative and qualitative data. Triangulation of the data ensures that the results are unbiased. The study shows that the business model and single components of the business model are the least relevant success factors of digital start-ups from the perspective of German venture capitalists. Moreover, this study has some evidence of the relevance of venture capital availability as a contextual factor. Instead, the results show, in line with the literature, that personality factors in general and team leadership skills, in particular, seem to have a significant impact on the success of digital start-ups from the perspective of German venture capitalists.

Keywords: digital entrepreneurship, digital start-up, integrated perspective, success factors, venture capital, venture investors

1. Introduction

Politics, media, and the public have increased attention to start-ups and innovative entrepreneurship within the last decade (Hahn, 2014). Successful entrepreneurship and its effects, e.g., a growing number of start-ups, are the prerequisites for intelligent, sustainable, and innovative economic growth (OECD, 2010). Although public debates and academic research frequently use the term start-up, there is no standard definition (Breschi et al., 2018). Cantner et al. (2021, p. 2) define the main activity as the “exploitation of previously non-commercialized knowledge and ideas.” Consequently, a digital start-up could be an internet-enabled start-up or a start-up that builds its business model on information-processing technologies to exploit non-commercialized ideas and knowledge. Digital start-ups thus prefer to use intangible assets and generally provide non-material products (Elia et al., 2020; Kollmann, 2006; Kollmann, 2016; Richter et al., 2016; Schallmo & Rusnjak, 2017; Skala, 2019). This lack of a commonly accepted definition shows how young this field of research still is.

Explaining start-up success is mainly based on the results of classical entrepreneurship research focusing on micro-level factors, i.e., research that assumes that personality factors are the main entrepreneurial success factors (Richter et al., 2016). However, in recent years, research on contextual factors has increased and provided evidence for the relevance of contextual factors (Alvedalen & Boschma, 2017; Cavallo et al., 2019; Elia et al., 2020; Malecki, 2018; Richter & Schildhauer, 2016; Schwarzkopf, 2016; Schweer & Sahl, 2017; Sullivan & Ford, 2014). These two perspectives, then, usually consider only one dimension. However, the interplay of personal, contextual, and business factors characterizes entrepreneurial performance, which must be viewed as a multiphase process (Shepherd et al., 2019). In their comprehensive quantitative literature review, Shepherd et al. (2019) conclude that although the number of entrepreneurship studies has increased over the past decade, the focus and the findings generally confirm the relevance of micro-level factors to success.

Recent research suggests that venture capital (VC) investment managers use multidimensional valuation approaches to evaluate start-ups with potential success. A systematic literature review by Köhn (2017), considering 58 articles on start-up valuation determinants, finds that business model characteristics, founder and team characteristics, and financial information are the most important information collected and evaluated in the assessment process. Examining German VC investors, Sievers et al. (2012) also show that non-financial

information and financial information are weighted equally meaningful in the assessment process. Based on these findings, VC investors can be considered highly informed experts who use multidimensional models to assess entrepreneurial success.

This study is based on original empirical research and addresses two central research questions (RQs): First, which predictors from the three different perspectives (micro, macro, and meso) do German VC investors believe have the most influence on their investment success and thus on the success of a digital start-up? Second, which entire group of factors is most relevant in explaining investment success from the perspective of German VC investors and thus the success of a digital start-up? First, this article highlights the present discussion of different research approaches before it presents the results of the empirical research, intending to answer the two research questions.

2. Theoretical Perspectives

The traditional entrepreneur concept goes back to Schumpeter, who defines the entrepreneurial actor as a person who is running a business alone or together with other co-entrepreneurs (Meyer, 2020, pp. 24-25). The risk of losing his or her capital characterizes the entrepreneur also as an equity investor. In this context, independent action, organizational, management and planning authority, and risk-taking are considered classic characteristics of entrepreneurship (Schaller, 2001, pp. 6-9). Fueglistaller et al. (2008, p. 1) go one step further and highlight the identification, evaluation, and exploitation of business opportunities. This understanding aligns with the Schumpeterian view of the entrepreneur and can also be called a major approach in classic entrepreneurship research based on the actors' perspective (Meyer, 2020, pp. 24-26).

The modern theory of the entrepreneur emerged at the initiative of American VC investors looking for success-related personality traits of entrepreneurs (Eckardt, 2015, p. 12; Meyer, 2020, pp. 24-29). With this business psychological approach, they hoped to explain the difference between entrepreneurs and managers (Volkman et al., 2010, p. 9). Furthermore, these models explain entrepreneurial success in behavioral dispositions, particularly the continuous search for business opportunities. Consequently, the personality characteristics of the founding team or the entrepreneur determine the company and its performance (Andersson, 2007, p. 129; Najmaei & Sadeghinejad, 2019, p. 103). However, Rauch and Frese (2008) and McMullen and Shepherd (2006) state that such a monistic approach is inappropriate to explain and promote entrepreneurial success without taking the business environment into account.

Overall, empirical research at the micro-level is becoming increasingly heterogeneous, both methods and perspectives (Audretsch, 2012, p. 755; Zahra et al., 2014, p. 487, 495). Far from being limited to the actor (Audretsch, 2012, pp. 761-762), actor-centered research examines entrepreneurial personality characteristics and human capital in its interaction with the environment based on this important distinction between manager and entrepreneur (Unger et al., 2011). For example, the Giessen-Amsterdam Model of Entrepreneurial Success, developed by a group of psychologists and economists of the Universities of Giessen and Amsterdam, explores the psychological conditions for the success of entrepreneurial activity. This model identifies four groups of factors (personality characteristics, human capital, entrepreneurial behavior and activities, and the firm's environment) that interact and assume that actions, cognitions, and processes can be modified to derive possible intervention recommendations (Rauch & Frese, 2008). The purpose is to systematically develop psychological conditions for success by creating appropriate supportive contextual factors (Rauch & Frese, 2000, pp. 101-104).

The number of publications that emphasize the relevance of personality characteristics for entrepreneurial success is significantly higher than those that consider contextual factors relevant (Richter et al., 2016; Shepherd et al., 2019). Some studies that examine the success relevance of single factor groups or several sub-factors of the Isenberg Entrepreneurial Ecosystem Model (Isenberg, 2014) find some evidence of, e.g., the higher availability of human capital in ecosystems (Jain & Ali, 2013; Richter et al., 2016; Schweer & Sahl, 2017; Unger et al., 2011). Other studies show that developed domestic markets with consumers who have a certain affinity for innovation can contribute to the success of a start-up (Richter et al., 2016). So does the presence of financing markets that provide a larger volume of venture capital (VC) and a variety of alternative financing instruments (Angerer et al., 2017; Lee et al., 2015; Richter et al., 2016; Schwarzkopf, 2016).

Furthermore, network effects such as knowledge spillovers (Delgado et al., 2014; Elia et al., 2020; Schweer & Sahl, 2017; Sullivan & Ford, 2014) or entrepreneurial support services infrastructure such as business accelerator programs, start-up consultants, and other institutions providing specialized start-up services (Richter et al., 2016) are seen as additional benefits of an ecosystem. Furthermore, institutionalized entrepreneurial communities (Acs et al., 2014) and the presence of non-governmental institutions (NGOs) such as university-affiliated associations or entrepreneurial training programs (Schwarzkopf, 2016) represent additional ecosystem benefits. The same is true for a transparent bureaucracy and low taxes (Richter & Schildhauer, 2016; Richter et al., 2016; Schwarzkopf,

2016) and a high-quality information and communication technology (ICT) infrastructure, especially with a view to the emerging of digital start-ups (Schweer & Sahl, 2017).

It is important to distinguish between two main types of entrepreneurial ecosystems: naturally emerging ecosystems and artificial ecosystems. The former develop without government intervention, and evolutionary dynamics resulting from the interaction of different individuals drive them (Auerswald & Dani, 2017; Belitski & Godley, 2020; Brown & Mason, 2017; Colombo et al., 2017; Isenberg, 2014). In contrast, artificial ecosystems also emerge spontaneously but are supported and regulated by policymakers or governmental organizations providing resources and a certain network (ecosystem) management (Colombo et al., 2017; Spigel, 2016; Stam & Spigel, 2016). The conclusion remains that research on entrepreneurial ecosystems has not yet developed a consistent perspective on interaction and is a fairly recent approach in the literature (Cavallo et al., 2019). Moreover, the relevance of artificial ecosystems to success is controversial (Kroiß, 2003).

Both the micro- and the macro-perspective consider the company only as a base or kind of a black box, and the classical approaches to business model analysis choose either a process model approach, a revenue model approach, or core competence concepts (Paul & Wollny, 2011, p. 66). Only in recent years have researchers begun to investigate the influence of the business model as a third perspective (Meyer, 2020, p. 14), finding that there is also no consistent and unambiguous definition of the business model either in professional management discourse or in the literature. Especially against the emerging digital economy backdrop, business model design and innovation have increased attention in practice and research (Schallmo, 2017, p. 2).

Although there is not yet a generally accepted system for describing business models, researchers and practitioners regularly use the business model approach of Osterwalder and Pigneur (2010) to examine and describe start-ups or growth companies (Schallmo, 2013, p. vii). Empirical research on the effects of business models on entrepreneurial success also provides relatively less clear evidence. For example, the systematic literature review by Sohl et al. (2020) shows that the business model explains only 5% of the ROA variance for established companies in mature markets. For start-ups, empirical research provides evidence for a positive impact of continuous business model development on start-up success, while adherence to the business model leads to start-up failure (Balboni et al., 2019).

3. Research Design

The present study draws on original research using a multi-perspective approach to examine the three dimensions of entrepreneurship research from the perspective of German VC investment managers in an explorative manner. Qualitative research findings have already been published (Schumacher, 2022). First, the researcher identifies the experts using the German Federal Association of the Digital Economy (BVDW) member list, which also lists start-up investors focusing on digital ventures. Then, based on this list of 725 potential experts and an initial mailing by e-mail or messaging via the professional online business network LinkedIn, 77 experts were recruited and interviewed mainly face-to-face, over the phone, or in videoconferences between August 2018 and February 2019.

3.1 Data Collection

The research explores the relative importance of and interaction between specific factor groups and single factors across dimensions regarding digital entrepreneurship (e-entrepreneurship) from a German venture investors' perspective. To this end, one reference model per each central research perspective was operationalized and used as a basis for data collection through semi-structured expert interviews. First, the Giessen-Amsterdam model as a personality factor model (Rauch & Frese, 2000; Rauch & Frese, 2008). Second, the Isenberg model is a reference model for contextual factors. Third, the Osterwalder-Pigneur business model approach is a model for business model components (Osterwalder & Pigneur, 2010).

The analysis resulted in a data model that includes the experts' weighting of 21 single factors and 3 factor groups related to the economic performance of digital start-ups (see Table 1).

Table 1. Factor groups operationalized in the questionnaire

<i>Factor Group</i>	<i>Single Factor</i>
Personality Characteristics of the Entrepreneur (Micro-Level Factors)	Education
	Professional & Industry Experience
	Motivation & Entrepreneurial Energy
	Product-Specific Know-How
	Organizational Skills
	Team Leadership Skills
	Strategic Thinking
Contextual Factors (Macro-Level Factors)	Willingness to Learn
	Finance: Availability of Venture or Seed Capital
	Policy: Support from the political sector such as tax breaks, Regulatory Relief, Access to Public Institutions (e.g., in research and others.)
	Culture: Entrepreneurial Culture (such as social respect for entrepreneurship, enthusiasm for innovation and experimentation, and others)
	Business Services: Availability of Start-up-Specific Consulting Services and Infrastructure (e.g., tax and management consultants, infrastructures such as broadband internet, start-up clusters, and others)
Business Model Components (Meso-Level Factors)	Human Capital: Availability of Well-Trained Employees
	Markets: Innovation-Friendly Domestic Market (receptive to innovative products or large enough for start-ups to grow sufficiently before having to risk internationalization)
	Availability of Strategic Suppliers or Key Partners
	Availability of Key Resources, i.e., resources that are central to the business idea/business model
	Convincing Value Proposition (of the service/product/offer)
	Plausible Market Segmentation (for structuring Marketing and Sales Channel Strategies)
	Detailed and Plausible Calculation of Sales, Costs, and Profit (profit and financial planning)
Detailed and Plausible Business Development and Implementation Planning	
	Plausible Revenue Stream Model, i.e., a model or idea of what benefits the customer will pay for and how much, and what other revenue streams can be developed in the near future with what revenue contributions

Note. Giessen-Amsterdam Model of Entrepreneurial Success (Rauch & Frese, 2008, p. 11), the Isenberg Entrepreneurial Ecosystem Model (Isenberg, 2014), and the business model approach of Osterwalder and Pigneur (2010, p. 44).

Regarding RQ1, the researcher first asked the experts about the success relevance of every factor per dimension. For this purpose, the researcher provided the experts with a list of operationalized factors and additional explanations on a handout. Second, the researcher asked the experts to select a maximum of three factors per group that they believe has the most significant influence on a digital start-up's success and weigh them so that the sum added up to 100%. In the final step of the first part, the researcher asked the experts to explain their weighting in greater detail. Then, in the second part of the interview, the researcher collected the data to answer RQ2, asking about the three dimensions of entrepreneurial success relevance. So, the experts had to weigh the entire factor group per dimension in this part of the interview. Therefore, the sum of the weightings should again add up to 100%.

In addition, the researcher collected data on the professional experience of the experts interviewed, the job description, and the volume of assets under management. The performance-based data also collected, such as the return on investment (ROI) achieved (3-year average) and the estimated success rate in evaluating start-up success (see Table 2), serve as dependent variables in the subsequent regression analysis. Finally, the filter question asked at the beginning of the interview ensures that all experts interviewed are active professional investment managers making decisions about funding digital start-ups.

In preparing the quantitative data, the researcher multiplied the factor weights by those of each dimension to obtain the weighted relevance of all factors. Finally, descriptive statistics presented these quantitative data (see Table 3). The experts' detailed reasons for their ratings of the factors and the factor groups form the qualitative data obtained. Accordingly, the interview is structured based on the previously collected quantitative data and does not focus on the totality of all factors when collecting the qualitative data. This part of the questionnaire is, thus, equivalent to a guided interview.

A total of 731 statements were collected in this way and categorized in a three-stage process according to the qualitative content analysis method of Mayring (2010). After the transcripts were divided into coding units (segments) in the first step, test coding for the inductive development of subcategories took place in the second

step. Finally, after the primary coding was carried out in the third step, the segments were assigned to the theory-based category system (deductive).

3.2 Sample Description

Table 2 provides an overview of the characteristics of the interviewed experts and shows that the selected sample consists of VC investors who are experts in digital start-ups. Not only do the experts interviewed have considerable professional experience in investing and financing in the field of digital start-ups (the mean value is seven years, the median five years), they also manage assets consisting of shares, bonds, and other financial investments, the volume of which ranges from EUR 40,000 to EUR 1 billion.

It is important to note that these experts continue to work with the start-ups after their investment, possibly reinvesting millions in the following years. They see whether their initial assessment of the economic success has proven correct. The mean and median of the self-assessed success rate lie in a narrow range (mean = 56%, median = 60%), indicating a normal distribution. Thus, there is no evidence of partial overconfidence bias in the group of selected experts.

Table 2. Descriptive statistics

<i>Variable</i>	<i>N (Valid)</i>	<i>Mean</i>	<i>Median</i>	<i>Range</i>	<i>Min.</i>	<i>Max.</i>	<i>Sum</i>
Mgmt. Experience (Years)	77	7.03	5.00	19.50	0.50	20.00	542
AuM (TEUR)	77	53,401	10,000	999,960	40	1,000,000	4,111,865
Start-up Experience (Years)	77	13.83	15.00	34.50	0.50	35.00	1,065
Gender (female = 0)	77	.92	1.00	1.00	.00	1.00	71
Investment Volume (TEUR)	77	10,238	2,000	100,000	0	100,000	788,292
Investment Success Ratio	77	.56	.60	1	0	1	
ROI realized	77	.36	.25	2.9	.10	3	
ROI expected	77	.24	.20	1	0	1	

Note. AuM = Asset under Management.

4. Data Analysis

Of the three groups of factors (1) personality characteristics of the entrepreneur (micro-level factors), (2) contextual factors (macro-level factors), and (3) components of the business model (meso-level factors), the experts interviewed rated the group of personality factors as most relevant to success, while the group of contextual factors was rated least relevant (see Table 3).

Table 3. Factor group weightings and single factor weightings of the experts (N = 77)

<i>Factor Group</i>	<i>N (Valid)</i>	<i>Mean</i>	<i>Median</i>	<i>Min.</i>	<i>Max.</i>
Personality Factors	77	49%	50%	30%	95%
Contextual Factors	77	21%	20%	2%	50%
Business Model Components	77	30%	30%	3%	50%
<i>Single Factor</i>	<i>N (Valid)</i>	<i>Mean</i>	<i>Median</i>	<i>Min.</i>	<i>Max.</i>
Education	77	0%	0%	0%	13%
Professional & Industry Experience	77	4%	0%	0%	26%
Motivation & Entrepreneurial Energy	77	4%	0%	0%	27%
Product-Specific Know-How	77	15%	15%	0%	57%
Organizational Skills	77	2%	0%	0%	17%
Team Leadership Skills	77	4%	0%	0%	21%
Strategic Thinking	77	4%	0%	0%	36%
Willingness to Learn	77	7%	8%	0%	23%
Other Personality Characteristics	77	8%	6%	0%	30%
Availability of Venture or Seed Capital	77	7%	6%	0%	30%
Support from the Political Sector	77	0%	0%	0%	6%
Entrepreneurial Culture	77	3%	0%	0%	10%
Availability of Consulting Services and Infrastructure	77	2%	0%	0%	13%
Availability of Well-Trained Employees	77	6%	6%	0%	16%
Innovation-Friendly Domestic Market	77	3%	0%	0%	18%
Other Contextual Factors	77	1%	0%	0%	10%
Availability of Strategic Suppliers or Key Partners	77	2%	0%	0%	17%
Availability of Key Resources	77	4%	0%	0%	18%
Convincing Value Proposition	77	10%	10%	0%	30%
Plausible Market Segmentation	77	3%	0%	0%	25%
Detailed and Plausible Financial Planning	77	1%	0%	0%	13%
Detailed and Plausible Implementation Planning	77	2%	0%	0%	18%
Plausible Revenue Stream Model	77	6%	6%	0%	30%
Other Business Model Factors	77	2%	0%	0%	14%

Among the weighted single factors, the Product-Specific Know-How and the Convincing Value Proposition show the highest mean values (see Table 3). However, this does not imply that these factors, in particular, can explain the success of an investment decision in a digital start-up as indicated by the Investment Success Rate and the Realized ROI by VC investors. Therefore, an explorative regression analysis is performed in four steps:

1. Regression analysis of the effect of all independent variables on the Realized ROI;
2. Regression analysis of the effect of all independent variables on the Estimated Investment Success Rate of the interviewee;
3. Regression analysis of the effect of the factor weightings for each factor group and the control variables (Management Experience, Assets under Management, Start-up Experience, Gender, and Investment Volume) on the Realized ROI;
4. Regression analysis of the effect of the factor weightings for each factor group and the control variables on the Estimated Investment Success Rate.

The regression on the Realized ROI in the first step yields three models (see Table 4). The final model (Model 3) includes three variables that are within the defined tolerance range (TOL) > 0.8. The lowest TOL among the included variables (single factors and factor groups) has maximum collinearity of 12%, so this model can be considered high quality. Furthermore, the three predictors in Model 3 (single factor Team Leadership Skills, factor group Personality Factors, single factor Venture Capital Availability) explain 36% of the variance in Realized ROI. Thus, these three independent variables have relatively high explanatory power regarding their influence on realized ROI.

Table 4. Realized ROI regression models

<i>Model</i>	<i>Adj. R Square</i>	<i>R Square Change</i>	<i>ANOVA Sig.</i>
1	.194	.205	.000
2	.305	.118	.000
3	.361	.063	.000

<i>Model</i>		<i>Beta</i>	<i>Sig.</i>	<i>Tol.</i>
1	(Constant)		.000	
	Team Leadership Skills	.453	.000	1.000
2	(Constant)		.066	
	Team Leadership Skills	.382	.000	.960
	Personality Factors	.350	.001	.960
3	(Constant)		.003	
	Team Leadership Skills	.382	.000	.960
	Personality Factors	.427	.000	.880
	Venture Capital Availability	.263	.008	.914

Note. Dependent Variable: Realized ROI.

Moreover, the standardized coefficients (beta weights) of all three predictors are positive, indicating that the VC investor's higher weighting of these factors leads to a higher Realized ROI. Looking at the significance levels (Sig.) of the three predictors, each variable within Model 3 proves significant with a value Sig. < 0.05 as significant. These results imply further evidence to support the assumption made earlier.

Table 5. Estimated success rate regression models

<i>Model</i>	<i>Adj. R Square</i>	<i>R Square Change</i>	<i>ANOVA Sig.</i>
1	.051	.064	.000
2	.099	.059	.000

<i>Model</i>		<i>Beta</i>	<i>Sig.</i>	<i>Tol.</i>
1	(Constant)		.000	
	Organizational Skills	.253	.027	1.000
2	(Constant)		.000	
	Organizational Skills	.246	.027	.999
	Professional & Industry Experience	.243	.028	.999

Note. Dependent Variable: Estimated Investment Success Rate.

Regression on the Estimated Success Rate as the second dependent variable yields two models in the second step, with both models again including variables within the defined range of TOL > 0.8 (see Table 5). The particularly low collinearity of the variables included (single factor Organizational Skills and single factor Professional & Industry experience) (see Table 5) characterizes Model 2 as extremely high quality. However, the explanatory power of the two predictors included in Model 2 amounts to a total of just under 10% of the Estimated Investment Success Rate variance.

In summary, both final models (the final Model on the Realized ROI and the final Model on the Estimated Investment Success Rate) include only personality factors, except for Venture Capital Availability in the first model. However, the contribution to the explanatory power of this predictor within this final Model 3, just under 7%, is minimal. Consequently, success in the investment decisions of VC investors can be explained primarily by a higher estimation of personality characteristics.

However, the regression analyses conducted in the third and fourth steps on the Realized ROI and the Estimated Investment Success Rate, which included only factor group weights as independent variables and the control

variables mentioned above, did not yield any regression models. Here, all variables entered were excluded due to insignificance. This fact is further evidence that only a few personality factors, rather than the general higher weighting of the entire group of personality factors, might determine the entrepreneurial success of digital start-ups as measured by the investment success of VC managers.

Based on the results presented earlier, the qualitative data analysis that provides interviewees' rationales for their factor weightings focuses on the two predictors from the final Model 3 to explain the variance in Realized ROI. When making investment decisions, the consideration of Team Leadership Skills, an intangible resource, and the Availability of Venture Capital, a tangible resource, seem to be the most important success factors that may lead to a higher ROI for VC investors and consequently to start-up success. The following qualitative data explain this finding.

As the interviewees pointed out, digital start-ups need teams with various skills that leaders must integrate to succeed (see Table 6).

Table 6. Selected statements on team leadership skills

<i>Expert</i>	<i>Statement</i>
Ex3	"The tinkerer who does his thing in a quiet room is a dying breed. I need a team for start-up success."
Ex31	"Start-up success always depends on the team."
Ex37	"One thing to say about team leadership: It's all about people. [...] The founder must not be too afraid to build a team around him that is stronger than he is."
Ex38	"Team leadership skills are extremely important because that's what makes all the development and growth opportunities possible."
Ex39	"I can work around unrest and difficulties in the team if I'm a good team leader. And in start-up teams, conflicts are 'the real normal'."
Ex40	"If you can't build a team, you won't be able to scale. Building and leading a team is more of strategic skill."
Ex44	"If you can lead a team, you can get the other areas in. Education and industry and stuff like that."
Ex57	"All the individual team members must complement each other - and these must then be guided toward a goal."
Ex65	"Team leadership skills are particularly important so that I can also lead and organize my heterogeneous team well."
Ex70	"Team leadership skills are also especially important. Finding a good team and keeping it is important."
Ex70	"In the start-up phase, you can't buy skills on the market for cost reasons; you have to get them into the team and keep them."

However, VC itself does not lead to success, as Expert 11 notes (see table 7). Moreover, several experts find that the availability of VC is generally necessary for the success of start-ups but not sufficient. For example, Expert 6 and other experts state that VC first becomes relevant when transforming the invention into innovation and scaling the business model in the growth phase. From the process perspective, it is reasonable to conclude that a successful team could be the basis for healthy upscaling and growth, thus the need for VC.

Table 7. Selected statements on venture capital availability

<i>Expert</i>	<i>Statement</i>
Ex1	"[...] many topics [...] which I can push ahead with venture capital speed."
Ex6	"For the very, very early phase, the availability of venture capital is therefore not so important. Later, however, VC becomes increasingly important as the company scales up."
Ex9	"The available capital is particularly important for a company's growth."
Ex11	"In the last 25 years, I have not heard of a single case where funding has led to success."
Ex15	"And the VC and PE funds are only important in later stages of development."
Ex16	"When I have money, I do my thing. That is still the most important thing to grow."
Ex18	"Money is, in fact, necessary to get something going quickly."
Ex21	"Good financial resources are always important. If you want to scale up, that is very important. Some people built a good start-up without VC, but that is not the rule. To be able to start quickly, VC is important."
Ex26	"VC is important, particularly for scaling digital business models."
Ex36	"Without capital, there is no scaling. Many founders underestimate this. The iteration takes at least 3 to 5 months, and many underestimate that."
Ex52	"A VC investor is, in any case, a good indicator that the idea is also economically successful."
Ex67	"Later, you need growth capital to scale. However, at the very beginning, that doesn't matter for digital companies."

5. Discussion and Key Findings

Based on an analysis of the quantitative assessments of German VC investors, this study suggests that single meso-level factors and entire groups of factors (micro-, macro-, and meso-levels) seem to be the least relevant for the success of digital start-ups. Moreover, there is only some evidence of the relevance of single contextual factors. Perhaps not surprisingly, interviewees weigh the Availability of Venture Capital as a success factor, especially in the later stages of the growth process. In particular, the qualitative data analysis shows that during the start-up process, the diversity and complementarity of a founding team in terms of creativity and skills is a prerequisite for later success. The importance of capital injections emerges only at later stages to help the company grow and scale to a greater extent than without external financing.

Thus, this multi-perspective study supports the findings of the literature reviews discussed in Section 2. As already shown by Richter et al. (2016), Shepherd et al. (2019), Andersson (2007), and Najmaei and Sadeghinejad (2019), micro-level factors seem to be most important for the success of start-ups. This study provides further evidence for this assumption by showing that the investment success of the experts interviewed, as measured by Realized ROI, is related to a high rating of personality characteristics as potential success factors.

The question, however, is whether VC investors correctly assess the impact of personality factors. From a theoretical perspective, the concept of *taste for assets* may be helpful to explain the issue. For example, taste for assets is used in the behavioral finance literature to describe irrational stock-picking decisions resulting in *home bias* (preferring domestic stocks over foreign stock or preferring stocks from a specific industry) or unsystematic risks, e.g., cluster risk.

Against this backdrop, the contradiction between the results of multiple regression and descriptive statistics could indicate investor bias. In addition, the comparatively high weighting of factors such as Product-Specific Know-How (micro-level factor) or Convincing Value Proposition (meso-level factor) by the surveyed active VC investors may indicate a cognitive bias. However, it is important to note that the regression model's low explanatory power does not provide more than a possible first indication of this phenomenon. More data and a different research design may be appropriate for an in-depth examination of this issue in follow-up studies. The empirical evidence presented here only suggests that there seems to be some cognitive bias in VC investors' assessment of entrepreneurial success factors and their actual relevance for investment success.

6. Limitations and Outlook

This mixed-methods exploratory has at least three strengths that affect researchers and practitioners. First, this study uses a multi-theoretical perspective by including the micro-, macro-, and meso-levels as the three main research perspectives of entrepreneurship. In this sense, it provides a more comprehensive perspective on entrepreneurial activity than previous studies. Second, this research provides an important external perspective on digital entrepreneurship in the start-up scene. The experts interviewed are not only observers who analyze founders, business models, and the context of start-ups but also practitioners who take financial risks. Third, its triangulation of qualitative and quantitative data allows for developing an evidence-based working model of digital start-up success.

One limitation of this study is the size of its sample (77 interviews), which is pretty low. Nevertheless, although the approach taken here is more limited than purely quantitative studies of the success relevance of single factors and entire factor groups, this study can at least approximate the results of a questionnaire-based survey with a higher number of cases. Future studies could refine the results.

For example, future research could reduce the number of model components to a small set of presumably influential factors to meet all requirements for a theoretical model. Such a model could then be the starting point for future research on the success factors of e-entrepreneurship. For example, this study found no evidence of policy measures' relevance, yet policymakers seem eager to allocate resources. Thus, future research could also explore the importance of entrepreneurship policies. Therefore, it stands to reason that an examination of provided subsidies in terms of their effectiveness in promoting innovative e-entrepreneurship is recommendable. However, this study points to another contextual factor that may have relevance, especially for VC investors. Since the provision of VC becomes more important first in the growth phase, the interviewed experts should reconsider the importance of this contextual factor in their implicit or explicit factor investment model. Furthermore, start-up entrepreneurs may find practical value in developing diversity in the top management team. Thus, this study provides empirical evidence that it is indeed necessary to develop the ability to lead a diverse management team, especially before approaching VC investors.

References

- Acs, Z. J., Autio, E., & Szerb, L. (2014). National Systems of Entrepreneurship: Measurement issues and policy implications. *Research Policy*, 43(3), 476-494. <https://doi.org/10.1016/j.respol.2013.08.016>
- Alvedalen, J., & Boschma, R. (2017). A Critical Review of Entrepreneurial Ecosystems Research: Towards a Future Research Agenda. *European Planning Studies*, 25(6), 887-903. <https://doi.org/10.1080/09654313.2017.1299694>
- Andersson, S. (2007). Entrepreneur's Influence on Firms' International Behavior. In R. A. Ajami & M. M. Bear (Eds.), *The Global Enterprise: Entrepreneurship and Value Creation*, 109-136. Binghamton: International Business Press.
- Angerer, M., Brem, A., Kraus, S., & Peter, A. (2017). Start-up funding via equity crowdfunding in Germany: A qualitative analysis of success factors. *The Journal of Entrepreneurial Finance*, 19(1), 1-34. Montrose, CA.
- Audretsch, D. (2012). Entrepreneurship research. *Management Decision*, 50(5), 755-764. <https://doi.org/10.1108/00251741211227384>
- Auerswald, P. E., & Dani, L. (2017). The adaptive life cycle of entrepreneurial ecosystems: the biotechnology cluster. *Small Business Economics*, 49(1), 97-117. <https://doi.org/10.1007/s11187-017-9869-3>
- Balboni, B., Bortoluzzi, G., Pugliese, R., & Tracogna, A. (2019). Business Model Evolution, Contextual Ambidexterity and the Growth Performance of High-Tech Start-Ups. *Journal of Business Research*, 99, 115-124. <https://doi.org/10.1016/j.jbusres.2019.02.029>
- Belitski, M., & Godley, A. (2020). The synergy approach to understand entrepreneurship and innovation ecosystem taxonomy. In Tsvetkova, A., Schmutzler, J. & Pugh, R. (Eds.), *Entrepreneurial Ecosystems Meet Innovation Systems: Synergies, Policy Lessons and Overlooked Dimensions* (pp. 152-172). Cheltenham: Edward Elgar.
- Breschi, S., Lassébie, J., & Menon, C. (2018). A portrait of innovative start-ups across countries. *OECD Science, Technology and Industry Working Papers No. 2018/02*. <https://doi.org/10.1787/f9ff02f4-en>
- Brown, R., & Mason, C. (2017). Looking inside the spiky bits: A critical review and conceptualisation of entrepreneurial ecosystems. *Small Business Economics*, 49(1), 11-30. <https://doi.org/10.1007/s11187-017-9865-7>
- Cantner, U., Cunningham, J. A., Lehmann, E. E., & Menter, M. (2021). Entrepreneurial ecosystems: a dynamic lifecycle model. *Small Business Economics*, 57(4), 407-423. <https://doi.org/10.1007/s11187-020-00316-0>
- Cavallo, A., Ghezzi, A., & Balocco, R. (2019). Entrepreneurial ecosystem research: present debates and future directions. *International Entrepreneurship and Management Journal*, 15(4), 1291-1321. <https://doi.org/10.1007/s11365-018-0526-3>
- Colombo, M. G., Dagnino, G. B., Lehmann, E. E., & Salmador, M. (2017). The governance of entrepreneurial ecosystems. *Small Business Economics*, 52(2), 419-428. <https://doi.org/10.1007/s11187-017-9952-9>
- Delgado, M., Porter, M. E., & Stern, S. (2014). Clusters, convergence, and economic performance. *Research Policy*, 43(10), 1785-1799. <https://doi.org/10.1016/j.respol.2014.05.007>

- Eckardt, S. (2015). *Messung des Innovations- und Intrapreneurship-Klimas: Eine quantitativ-empirische Analyse*. Wiesbaden: Springer Gabler.
- Elia, G., Margherita, A., & Passiante, G. (2020). Digital entrepreneurship ecosystem: How digital technologies and collective intelligence are reshaping the entrepreneurial process. *Technological Forecasting and Social Change*, 150(1), 1-12. <https://doi.org/10.1016/j.techfore.2019.119791>
- Fueglistaller, U., Müller, C., & Volery, T. (2008). *Entrepreneurship Modelle, Umsetzung, Perspektiven* (2nd ed.). Wiesbaden: Gabler.
- Hahn, C. (2014). Die Startup-Szene in Deutschland. In C. Hahn (Ed.), *Finanzierung und Besteuerung von Startup-Unternehmen* (pp. 7-16). Wiesbaden: Gabler.
- Isenberg, D. (2014). What an Entrepreneurship Ecosystem Actually Is. *Harvard Business Review Online*, May 12, 2014. Retrieved from <https://hbr.org/2014/05/what-an-entrepreneurial-ecosystem-actually-is>.
- Jain, R., & Ali, S. W. (2013). A Review of Facilitators, Barriers and Gateways to Entrepreneurship Directions for Future Research. *South Asian Journal of Management*, 20(3), 122-163.
- Köhn, A. (2017). The determinants of startup valuation in the venture capital context: A systematic review and avenues for future research. *Management Review Quarterly*, 68(1), 3-36.
- Kollmann, T. (2006). What is e-entrepreneurship? Fundamentals of company founding in the net economy. *International Journal of Technology Management*, 33(4), 322-340. <https://doi.org/10.1504/IJTM.2006.009247>
- Kollmann, T. (2016). *E-Entrepreneurship: Grundlagen der Unternehmensgründung in der Digitalen Wirtschaft* (6th ed.). Wiesbaden: Springer Gabler.
- Kroiß, A. (2003). *Erfolgsfaktoren von Internet-Startups. Eine empirische Untersuchung deutscher Unternehmensgründungen*. Hamburg: Kovac.
- Lee, N., Sameen, H., & Cowling, M. (2015). Access to finance for innovative SMEs since the financial crisis. *Research Policy*, 44(2), 370-380. <https://doi.org/10.1016/j.respol.2014.09.008>
- Malecki, E. J. (2018). Entrepreneurship and Entrepreneurial Ecosystems. *Geography Compass*, 12(3). <https://doi.org/10.1111/gec3.12359>
- Mayring, P. (2010). *Qualitative Inhaltsanalyse. Grundlagen und Techniken*. Weinheim und Basel: Beltz Juventa.
- McMullen, J. S., & Shepherd, D. A. (2006). Entrepreneurial Action and The Role of Uncertainty in The Theory of the Entrepreneur. *Academy of Management Review*, 31(1), 132-152. <https://doi.org/10.5465/AMR.2006.19379628>
- Meyer, K. (2020). *Persönlichkeit, Selbststeuerung und Schlüsselkompetenzen erfolgreicher Unternehmerinnen*. Wiesbaden: Springer Gabler.
- Najmaei, A., & Sadeghinejad, Z. (2019). Metacognition, Entrepreneurial Orientation, and Firm Performance: An Upper Echelons View. In A. Caputo & M. M. Pellegrini (Eds.), *The Anatomy of Entrepreneurial Decisions* (pp. 79-114). Cham: Springer. https://doi.org/10.1007/978-3-030-19685-1_5
- OECD (2010). *SMEs, Entrepreneurship, and Innovation*. Paris: OECD Publishing.
- Osterwalder, A., & Pigneur, Y. (2010). *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*. Hoboken: Wiley.
- Paul, H., & Wollny, V. (2011). *Instrumente des strategischen Managements: Grundlagen und Anwendungen*. Munich: Oldenbourg.
- Rauch, A., & Frese, M. (2000). Psychological approaches to entrepreneurial success: A general model and an overview of findings. *International Review of Industrial and Organizational Psychology*, 15, 101-142.
- Rauch, A., & Frese, M. (2008). Born to be an entrepreneur? Revisiting the personality approach to entrepreneurship. Submitted for publication. In J. R. Baum, M. Frese, & R. A. Baron (Eds.), *The psychology of Entrepreneurship* (pp. 41-65). New York: Lawrence Erlbaum.
- Richter, N., & Schildhauer, T. (2016). *Innovation, Gründungskultur und Start-ups Made in Germany. Aus Politik und Zeitgeschichte*, 66(16-17), 10-25.
- Richter, N., Volquartz, L., Neumann, K., & Schildhauer, T. (2016). Fostering and Hindering Factors — Success of Early Stage Internet-Enabled Startups, *HIIG Discussion Paper Series*. Berlin.

- <https://doi.org/10.2139/ssrn.2789375>
- Schaller, A. (2001). Entrepreneurship oder wie man ein Unternehmen denken muß. In Blum, U. & Leibbrand, F. (Eds.), *Entrepreneurship und Unternehmertum: Denkstrukturen für eine neue Zeit* (pp. 3-56). Wiesbaden: Gabler.
- Schallmo, D. (2013). *Geschäftsmodell-Innovation : Grundlagen, bestehende Ansätze, methodisches Vorgehen und B2B-Geschäftsmodelle*. Wiesbaden: Springer Gabler.
- Schallmo, D. (2017). *Design Thinking erfolgreich anwenden*. Wiesbaden: Springer Gabler. <https://doi.org/10.1007/978-3-658-12523-3>
- Schallmo, D., & Rusnjak, A. R. (2017). Roadmap zur Digitalen Transformation von Geschäftsmodellen. In Schallmo, D., & Rusnjak, A. R. (Eds.), *Digitale Transformation von Geschäftsmodellen*, 1-32. Wiesbaden: Springer Gabler.
- Schumacher, N. (2022). The Relevance of Entrepreneurship Ecosystems for Start-up Success: A Venture Capital Perspective. In Baumann, S. (Ed.), *Handbook on Digital Business Ecosystems: Strategies, Platforms, Technologies, Governance and Societal Challenges*. Edward Elgar: Cheltenham.
- Schwarzkopf, C. (2016). *Fostering Innovation and Entrepreneurship. Entrepreneurial Ecosystem and Entrepreneurial Fundamentals in the USA and Germany*. Wiesbaden: Springer Gabler.
- Schweer, D., & Sahl, J. C. (2017). The Digital Transformation of Industry – The Benefit for Germany. In Abolhassan, F. (Ed.), *The Drivers of Digital Transformation* (pp. 23-31). Cham: Springer. https://doi.org/10.1007/978-3-319-31824-0_3
- Shepherd, D. A., Wennberg, K., Suddaby, R., & Wiklund, J. (2019). What Are We Explaining? A Review and Agenda on Initiating, Engaging, Performing and Contextualizing Entrepreneurship. *Journal of Management*, 45(1), 159-196. <https://doi.org/10.1177/0149206318799443>
- Sievers, S., Mokwa, C. F., Keienburg, G. (2012). The Relevance of Financial versus Non-Financial Information for the Valuation of Venture Capital-Backed Firms. *European Accounting Review*, 22(3), 467-511. <https://doi.org/10.2139/ssrn.1449740>
- Skala, A. (2019). *Digital Startups in Transition Economies: Challenges for Management, Entrepreneurship, and Education*. Cham: Palgrave MacMillan.
- Sohl, T., Vroom, G., & Fitza, M. (2020). How Much Does Business Model Matter for Firm Performance? A Variance Decomposition Analysis. *Academy of Management Discoveries*, 6(1), 61-80. <https://doi.org/10.5465/amd.2017.0136>
- Spigel, B. (2016). Developing and governing EEs: The structure of entrepreneurial support programs in Edinburgh, Scotland. *International Journal of Innovation and Regional Development*, 7(2), 141-160.
- Stam, F. C., & Spigel, B. (2016). Entrepreneurial ecosystems. *USE Discussion Paper Series*, 16(13).
- Sullivan, D. M., & Ford, C. M. (2014). How Entrepreneurs Use Networks to Address Changing Resource Requirements During Early Venture Development. *Entrepreneurship Theory and Practice*, 38(3), 551-574. <https://doi.org/10.1111/etap.12009>
- Unger, J. M., Rauch, A., Frese, M., & Rosenbusch, N. (2011). Human capital and entrepreneurial success: A meta-analytical review. *Journal of Business Venturing*, 26(3), 341-358.
- Volkman, C. K., Tokarski, K. O., & Grünhagen M. (2010). *Entrepreneurship in a European Perspective: Concepts for the Creation and Growth of New Ventures*. Wiesbaden: Gabler Springer.
- Zahra, S. A., Wright, M., & Abdelgawad, S. G. (2014). Contextualization and the advancement of entrepreneurship research. *International Small Business Journal*, 32(5), 479-500. <https://doi.org/10.1177/0266242613519807>

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