Phase dependency of success factors in startups

Torsten Klein

Wienel Dasija

Sophie Meinerzhagen

Autoren

Klein, Torsten, Prof. Dr. rer. pol., Professor für Betriebswirtschaft mit dem Schwerpunkt Unternehmensführung am Institute for Business Administration and Leadership an der TH Köln (Campus Gummersbach). Arbeits- und Forschungsbereiche: Strategische Unternehmensführung, Arbeit und Organisation, Teilhabe und Nachhaltigkeit.
torsten.klein@th-koeln.de

Dasija, Wienel, Bachelor of Engineering (B.Eng.) am Institute for Business Administration and Leadership an der TH Köln (Campus Gummersbach).

Meinerzhagen, Sophie, Master of Science (M.Sc.) und wissenschaftliche Mitarbeiterin am Institute for Business Administration and Leadership an der TH Köln (Campus Gummersbach). Arbeits- und Forschungsbereiche: Sozioökonomie, Teilhabe und Nachhaltigkeit.
sophie.meinerzhagen@th-koeln.de

Technology
Arts Sciences
TH Köln

Abstract

The purpose of this article is to analyze the specific success factors of start-ups and to examine their phase dependency. Based on a literature study, 13 start-up-specific success factors from three categories (founders, situational occurrence, strategy) are identified and examined for their influence and phase dependency. For this purpose, 54 employees of successful german start-ups are asked how strongly they assess the influence of the respective success factor and in which phase (pre-foundation, foundation, growth) it has the strongest effect. The results show that the hypotheses derived from the theory are confirmed to a very large extent by the study.

Content

1 Introduction

The economic importance of startups has increased significantly in Germany in recent years. The average number of employees increased by 31% from 2017 to 2020 (Kollmann et al., 2020). Venture capital investment in Germany, as in the European Union as a whole, more than doubled in the years from 2017 to 2019. The share of foreign venture capital investment, accounting for 75% in 2019, nearly tripled over the same period (Dealroom, 2020). Even in the pandemic-ridden year of 2020, the number of startups in Germany increases significantly to 2,734; despite the pandemic, the trend is strongly upward (Käufer and Conell, 2021).

Although the importance of startups for the German economy is increasing, the success factors of German startups are too little in the focus of science. Success factor research has been developing suitable models of success for companies since the 1990s. However, it often neither distinguishes between startups and classic companies, nor does it explicitly address the relationship between success factors and the specific startup and growth phases.

This paper aims to show the phase dependency of startup specific success factors. First, a definitional differentiation of startups from classic companies is made based on the literature. Furthermore, the characteristics of the phases of startups are elaborated. Subsequently, existing approaches to success factor research are examined for their suitability in the context of startups, before finally the conceptual consolidation of the basics of success factor research with the phase dependencies in startups takes place. The conceptual part of the paper is built based on literature work. Furthermore, a study with 54 participating startups was conducted in order to also empirically capture the success factors and to enable the assignment of success factors to specific startup phases.

2 Theoretical Framework

2.1 Differentiation of startups from classic companies

German startups had an average of 14.3 employees in 2020 (Kollmann et al., 2020). Based purely on the number of employees, most startups would probably be considered small companies. However, a significant difference between a small traditional company and a startup lies in the degree of innovation. While a startup has a high degree of innovation, a small classical company has a comparatively low degree of innovation (Fallgatter, 2004). A startup can only access past data to a limited extent (Diehm, 2017). As a result, no statement can be made about the innovation outcome until the product or service appears on the market. Consequently, this results in a higher willingness to take risk for startups than for traditional companies (Jacobsen, 2006).

According to Diehm (2017), a distinction is made between imitative and innovative company foundations. Imitative foundations, which often occur in the retail, craft or professional sectors, are conventional foundations. In these areas, a comparable business model often already exists and the basic success factors for this are therefore frequently known. In comparison, startups are innovative foundations. The startups that emerge from innovative company formations do not have an established business model and usually have only limited resources at the beginning. In addition, the specific market environment tends to be unknown due to the innovation.

Other factors differentiating startups from classic companies are the financing options. Classic companies are more easily financed by credit institutions due to already confirmed business models. In contrast, startups must rely on other financing methods (Cotei and Farhat, 2017). One way of financing startups, especially in early stages, is financial bootstrapping. Financial bootstrapping is the term used

to describe financing that deals almost exclusively with raising capital from the company's own resources or through operations (sales) (Vanacker et al., 2011). The advantage of this financing method is the retention of complete sovereignty over one's own startup, as the founders remain the sole shareholders. Another type of financing is provided by so-called business angels, i.e. investors who can also draw on their own startup experience. Compared to traditional investors, business angels are more likely to contribute liquid funds already in the early stages of startups (Schnedler, 2020).

Moreover, according to Fallgatter (2004), the growth and employment potential of traditional companies tends to be limited, whereas startups tend to have significantly higher potential. According to Diehm (2014), the market environment of startups does not exist or does not yet exist completely. This makes it difficult to assess their likely success.

2.2 Approaches to success factor research

Operational success reflects the degree to which a company has achieved its goals and can be viewed from various perspectives. This results in success indicators such as profit increase, employee growth or productivity (Diehm, 2017).

Success factor research has gained importance with the beginning of the 1990s. In a study by Lussier (1995), fifteen variables for the success and failure of companies could be identified. In a further study by Lussier and Halabi (2010), four variables remained after a regression analysis that have significant relevance to business success: Planning, Mentors, Training, and Employees. Previously, Sandberg (1986) had already identified three categories that have influence on business success in one approach: Founder characteristics, Business strategy, Industry structure. McDougall et al. (1992) focus on the incident of the startup rather than the founder. Sapienza and Grimm (1997) extended the approaches to include the founder incident.

Jacobsen (2006) criticizes the approaches to success factor research for largely ignoring the temporal dimension. Previously established models mainly take a static perspective and do not sufficiently include the dynamic development of company phases. Success factors are not examined with regard to phase dependencies. However, this aspect plays an essential role especially for young as well as agile companies and volatile markets as well as in the dynamic technology and environment context.

The approach of Covin and Slevin (1991) also does not do justice to a dynamic approach. The latter centers the difference between internal, external and strategic factors that affect the entrepreneurial attitude and thus influence the company's success. Although this expands the field of observation to include the explicit magnitude of external factors, the temporal level also remains underexposed. They make a significant contribution primarily by identifying indirect and direct indicators of corporate success.

In contrast, Cooper et al. (1994) at least incorporated a dynamic component into their research methodology by collecting data from 2994 founders and their companies over three consecutive years. This provided them with a time series as a database from which conclusions could be drawn about the success factors within a three-year period of companies However, this approach does not cover the complete business phases that organizations go through from inception to establishment and maturation within the first essential nine to 12 years (Kollmann, 2020; Frese, 2014). In addition, this model does not address individual success factors, but only categories that include multiple sub-success factors. Nevertheless, the basic approach of Cooper et al. (1994) is relevant for the success factor research focused in this paper, as the model also addresses the foundation process as a major influencing factor. Furthermore, the authors describe the factors founder person, founding environment and characteristics of the company as starting points for business success.

Based on existing research findings, Jacobsen (2006) establishes a theoretical frame of reference for clarifying phase-dependent success factors in company formation. In doing so, the author identifies three dimensions, which in turn come into play in three essential phases of the startup. The dimensions include personnel, organizational and external factors. The startup phases are referred to as prerequisite, action process and the new company. In the conception of the success factor model, Jacobsen focuses primarily the early establishment phase and thereby above all the transition from the preestablishment phase (condition) to the concrete establishment execution (action process) up to the enterprise emergence (new enterprise). In his work, he explicitly refers to the high importance of phase dependency and provides a significant contribution to the modern understanding of dynamic requirements for corporate agility and the impact on corporate success (Teece et al., 2016). However, the approach does not provide insights beyond the early stages of firm formation.

Therefore, the paper presented here is devoted to a temporally extended view of the phase dependence of corporate success in startups.

2.3 Phase models for startups

Startups go through several phases in their development. According to Fallgatter (2004), the phases can be distinguished based on the criterion of growth. This suggests that the success factors of startups could possibly be assigned to a time cycle. Therefore, the market development and corporate life cycle of startups move into focus in the remainder of this paper.

The market development lifecycle model according to Diehm (2017) includes the phases of pre-founding, founding, growth, maturity/saturation, and market exit/innovation. The model describes a growth progression of sales as a function of time. In the (pre-)foundation phase, sales are at their lowest. From the growth phase onwards, it increases significantly and reaches its peak in the maturity phase. Thereafter, sales decline until market exit or the introduction of an innovation (Fig. 1).
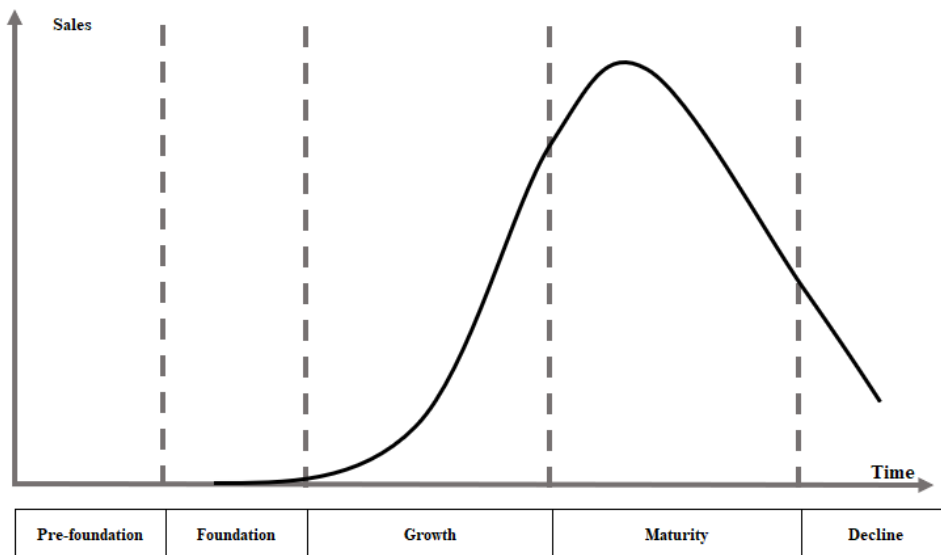

Figure 1: Life cycle model of young companies (adapted from Diehm, 2017)

Diehm's (2017) model thus fits into the logic of a large number of approaches to small companies, such as that of Scott and Bruce (1987), which place comparable phases in relation to company growth. Comparable phases are also explicitly found in research on startups (Eberle, 2004; Engelen et al., 2015). For example, Kumbhat and Sushil (2018) analyze phases one to four in their empirical study and label them with the terms discovery stage, validation stage, refinement stage, and growth stage.

In doing so, they examine the relevance of the startup stages in practical implementation and confirm the basic phase logic.

3   Methodology

3.1   Research context and model

Based on existing research approaches on indicators of operational success and on startups, a structured framework model of phase-dependent success factors in startups could be developed. The model considers the temporal dimension, the three categories of founder, situational occurrence and strategies, and direct and indirect success criteria.

The temporal aspect borrows from Diehm's (2017) life cycle model and focuses on the first three phases: Pre-foundation, Foundation, and Growth. These three temporal phases are used to develop the framework model because these phases are of highest relevance for startups. Startups that have initial approaches and business ideas are in the pre-foundation phase. The development of a product or service and first sales take place in the foundation phase. In the growth phase, a scalable business model is already being executed.

The categories of the structured framework model are built based on the New Venture Performance Model in origin after Sandberg (1986). There is a distinction between founder, situational occurrence and strategy. In addition, as in the model of Covin and Slevin (1991), a distinction is made between direct and indirect success factors. A large part of the chosen success factors is transferable from the Success/Failure model (Lussier, 1995; Lussier and Halabi, 2010), the success model for new companies (Cooper et al., 1994) and the success model according to Jacobsen (2006).

Associated success criteria are assigned to the three categories formed based on the literature and hypotheses are derived. Thirteen success factors are identified and subdivided based on the categories:

- – Founders: personality traits, human capital, team foundations, environment and network.
- – Situational occurrence: innovation, time of market entry, founder motivation
- – Strategy: location, financing, planning, business model and marketing.

In addition, a distinction is made between direct and indirect success factors:

- – The direct success factors influence the category and thus directly the enterprise success.
- – Indirect success factors influence one to several direct success factors and different categories and have an indirect effect on the company's success. These include the prerequisites or resources that are important for some direct success criteria or the category.

Subsequently, the success factors are checked for phase dependency by assigning them to the temporal startup phases. The temporal delineation into three phases is based on the success model of Jacobsen (2006). The value assignment (influence strength) is based on a point scale from 1 to 5. The higher the value, the higher the influence on success is estimated. The value assignment is based on the literature review. In Figure 2, the pre-founding, founding and growth phases are shown in chronological order and separated by horizontal dashed lines, since the transitions between the phases cannot be delineated with pinpoint accuracy. The study focuses on these three phases because the specifics of startups differ significantly from those of traditional companies in these phases and the company's development is most dynamic.
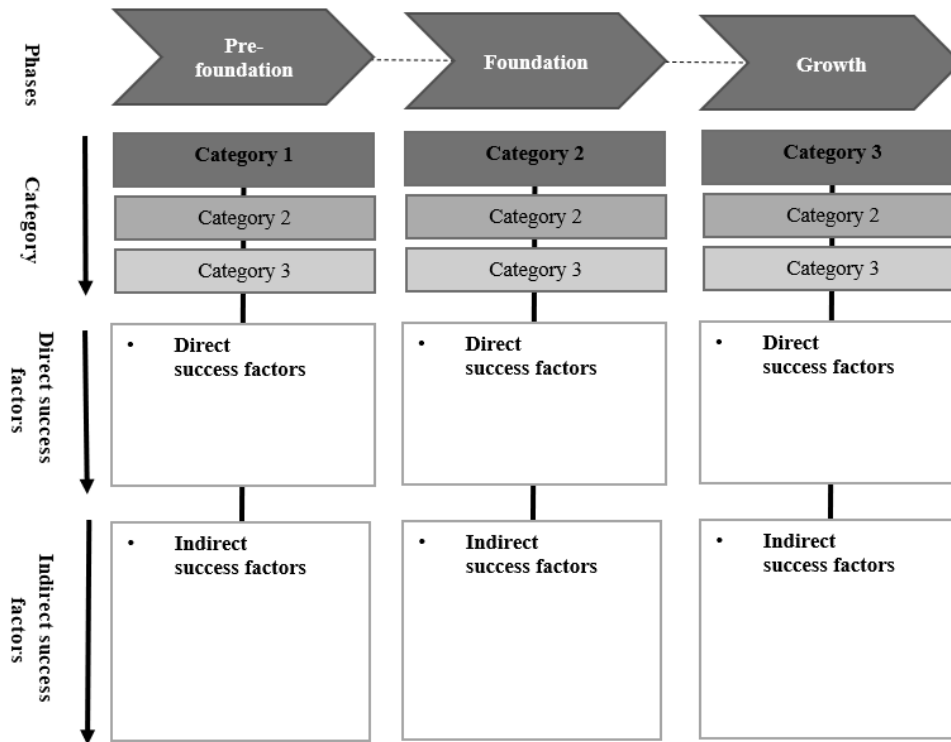
Figure 2: Development of model of phase dependent success criteria for startups

In the framework model, the category with the strongest influence is shown at the top and the one with the least influence at the bottom. The sorting is analogous for the direct and indirect success factors. The success factor with the strongest influence on success is at the top and the one with the weakest influence on success is at the bottom. If the values are assigned equally, they are sorted alphabetically.

3.2 Data generation and analysis

The phase dependency of success factors for startups is analyzed. Based on the empirical investigation, the prioritization of success factors is determined. Furthermore, the success criteria are assigned to the temporal phases. The study tests the hypotheses developed from the literature review.

A quantitative survey was conducted at the beginning of 2021, in which startups from Germany participated. The survey was conducted through an online survey and respondents were mostly contacted via email. The contacted respondent group consisted of the following:

- Startup Directory NRW (Kollmann et al., 2014): 412 startups.
- Winners of the German Startup Prize in the category Startups 2014 - 2019: 32 startups
- Startups from online portals (Facebook, XING): 29 startups
- Winner of the German Startup Award (2019): 8 Startups
- Other startups: 2 startups.

The startups in the Startup Directory NRW from 2014 that still exist can be interpreted as economically successful. The winners of the German Startup Award and the German Startup Award as well as the two other startups were classified as successful by external evaluators.

The questionnaire consists of three question blocks: First, general questions about the company and the experience and role of the participant, then questions about success criteria, and finally questions about phase dependency. The success criteria are weighted with a point scale between 1 and 5 (1 =

low influence on success, 5 = high influence on success). The individual success criteria are reviewed here for their value assignment from the literature review. Then, the success criteria are assigned to the pre-startup, startup, and growth phases. For each success criterion, the phase in which the criterion has the highest influence is selected.

4   Findings

4.1   Literature-based identification of success factors

4.1.1   Founder of the startup

Through the literature analysis, five success factors can be identified that have a significant influence on success in startups and fall into the category of the founders or the founding team. According to this, personality traits, human capital, team foundations, the environment and the network of the founders are essential.

Empirical studies have already shown that personality traits influence entrepreneurial success and operational profitability (Caliendo, 2014; Yang and Aid, 2019). Moreover, a positive relationship can be concretely demonstrated between the two personality traits extroversion and openness to experience on the one hand and creativity on the other. Creativity, in turn, is a driver of innovative business ideas (Zare and Flinchbaugh, 2019). In addition, extroverts are more easily able to build social networks. The formation of networks in the founders' environment is an essential prerequisite for successful self-employment (Yang and Aid, 2019). Jacobsen (2006) further identifies the criteria of initiative, willingness to achieve, and ambition as important personality traits of founders. The willingness to take risks also has a positive influence on the success of startups (Groenewegen and de Langen, 2012).

However, personality traits of founders do not directly influence success; rather, the interaction of personality with human capital, network, and other factors is crucial. Personality traits therefore act as an indirect factor on the success of startups. According to Jacobsen (2006), personality traits exert a medium level of influence on the success of startups. Therefore, personality traits of the founders can be included in the underlying systematics of this article with an influence strength of 3. Finally, the following hypothesis is derived from this evaluation:

> H1a: Personality traits have a medium indirect influence on organizational success.

The success factor human capital includes skills, knowledge, and experience of the founders. The literature analyzed distinguishes between educational level, management experience, specific industry knowledge, initial startup capital and the demographic criterion of the founder's age (Cooper, 1994).

A U.S. study of more than 4000 respondents shows that founders with higher levels of education are also more likely to succeed in generating business growth. In addition, firms that can draw on higher levels of human capital tend to be larger, more innovative, and more profitable (Zhou and Farquharson, 2016). In Germany, 83.9% of startup founders have an academic degree (Hirschfeld et al., 2020). The level of education shows a strong relationship with skills, knowledge, experience as well as discipline, motivation, self-confidence and ultimately business success (Cooper et al., 1994).

Additionally, founders who have access to management experience through a previous startup are more successful than founders with little or no management experience (Cooper et al., 1994). They can cope with a wider range of problems because of the experience, or they can establish new contacts with suppliers or customers more easily.

Another relevant component of the human capital success factor is specific industry knowledge. This has a positive effect on the probability of survival and growth of the startup. In the literature, however, the influence of this factor on corporate success is rated as rather low (Cooper et al., 1994). This could be due to the fact that innovativeness and the will to do something new is weightier for startups than knowing existing structures of the industry, since startups are particularly characterized by these very qualities.

The initial startup capital, also referred to as financial capital, has a fundamentally positive effect on the startup's probability of survival as well as its growth, as does specific industry knowledge. The capital that the founders can access allows them to change strategy and have further liquidity in case the business model fails (Cooper et al., 1994).

The age of the founder is identified as a demographic criterion. In Germany, more than 50% of all company founders are between 25 and 44 years old (Maier and Ivanov, 2018). For startups, this figure is 75.5% (Hirschfeld et al., 2020). According to the research of Prasad et al. (2015), there is a positive correlation between the age of the founder and the success of the company. This correlation is due to characteristics of human capital, such as management experience or education level, and not directly due to age.

According to Cooper et al. (1994), high human capital has a positive effect on business success and on the probability of survival, especially at the beginning of the startup. Based on the strong influence of human capital on success described in the literature, an influence strength of 5 can be concluded. The following hypothesis can be derived:

> H2a: Human capital has a very high direct impact on corporate success.

Furthermore, the factor team foundation vs. individual foundation is conspicuous in the literature analysis. However, no clear picture can be subsumed here. Some empirical studies do show that startups founded by a team are more successful than those founded by individuals. However, the industry under consideration is the decisive factor. Team startups are particularly successful when it comes to high-tech products or services (Jacobsen, 2006). It can also be stated that the team has an impact on the environment and the human capital. As a result, team formation is an indirect success factor. Since the advantages of team formation obviously outweigh the disadvantages in many cases, but there is an industry dependency of the factor under consideration, a rather low influence strength of 2 is assumed. On this basis, the following hypothesis is formulated:

> H3a: Compared to individual startups, team startups have an indirectly low impact on business success.

Another success factor is the environment of the founders at the micro and macro level. Studies show that the personal environment at the micro level (friends, family, and work environment) in particular has an influence on the success of companies (Jacobsen, 2006). Here, among other things, the emotional experience and support from the environment plays a significant role. On the macro level, on the other hand, there is, for example, government startup support, infrastructure and competition regulations, and the startup climate of the market and society (Attahir, 1995; Frese et al., 2002; Jacobsen, 2006).

The environment is a direct success factor for the founder and the business success. Therefore, this success factor is rated with a very high influence according to Jacobsen (2006). The influence strength is evaluated with 5. From this, the following hypothesis can be derived:

> H4a: The environment (family, friends, work, government, economic climate) has a direct very high influence on business success.

The social network of the founders as a further factor is also highly relevant for the business success of startups and according to the literature review, is becoming increasingly important (Ricken and Seidl, 2010; Albourini et al., 2020). A network consists of relationships with internal and external partners. Research shows that the size, density, as well as the structure of the network have high positive effects on the performance of small businesses and startups (Street and Cameron, 2007).

Albourini et al. (2020) empirically identify the relevance of the network to startups' business success. This includes exchanging ideas with other startups, attending events, and establishing and maintaining contacts with internal and external partners. As a result, the network can have a positive impact on the relationship with suppliers, customers, and the market. For example, better supplier conditions can be negotiated. In some markets, the network can be used to draw on past data from other market participants and thus prevent weaknesses on the part of startups. Networks facilitate access to resources. The literature analysis reveals a high relevance of the network factor for the success of startups. Therefore, the strength of influence is rated as 5.

> H5a: The network has a direct, very high influence on the company's success.

4.1.2 Situational occurrence of the startup

According to the literature analysis, the situational condition of startups as a category includes the success factors degree of innovation, time of market entry and founder motivation.

Companies with products or services that have a high degree of innovation are often able to generate higher growth than companies with a low or no degree of innovation (Lussier and Halabi, 2010). Innovation is related to the opportunity for higher market share (Freudenthaler-Mayrhofer and Sposato, 2017). The vast majority of literature sources attribute a very high influence on business success to the degree of innovation for startups. Therefore, the strength of influence is given as 5. The following hypothesis can be made:

> H6a: The degree of innovation of the product/service has a direct very high influence on the business success of startups.

The time of market entry describes two facets. First, it refers to the economic situation (downturn, stagnation, upturn or boom) in which the country of the startup is located. The economic situation plays an essential role for startups. As early as 1995, a study showed that companies founded during a recession had a higher risk of failure (Lussier 1995). Consequently, the reverse is true: a country that is in an upswing or boom has a high positive success on business success (Rammer and Peters, 2010). According to Jacobsen (2006), economic phases have a strong effect on success.

Second, the time dimension of an innovation is relevant to success. The right time of market entry in combination with the technological standard plays an important role especially for startups (Walgenbach, 2008). The supplier of an innovative product who is the first company to establish itself on the market at the right time gains a strategic competitive advantage. Song et al. (2010) prove the connection between the timing of innovations and company success through their research. The influence of the time of market entry is considered significant in the literature. Therefore, the influence strength is classified as 5.

> H7a: The right time for market entry has a direct very high influence on success.

Furthermore, the founders' motives represent an influencing factor: extrinsic rewards, autonomy, intrinsic rewards, and family security (Benzing et al., 2009). Through the literature review, it is clear that founder motivation also depends on country-specific regionality and thus motivations can differ significantly (Jacobsen, 2006). Therefore, in this paper, founder motivation was assigned to the domain of situational occurrence instead of founder person.

According to Benzing et al. (2009), the level of influence of motivation on business success is determined by the above four motivations. Based on this research, the influence level is 3. The following hypothesis is made:

> H8a: A high founder motivation has an indirect medium influence on business success.

4.1.3 Startup strategy

A challenge for many startups is to develop strategies and implement them in the market, thereby achieving high and long-term growth (O'Reilly and Binns, 2019). In this context, strategy mainly includes considerations and decisions regarding location, financing, planning, business model, and marketing (Cordeiro, 2014).

In the location selection success factor, three main criteria are distinguished: cost, demand, and intangible characteristics. The interaction of these criteria is decisive for the choice of location (Wendt, 1972). Furthermore, it can be stated that startups often settle in clusters. Young companies influence each other positively because, among other things, this makes it easier to build networks (Jacobsen, 2006). The location therefore has an indirect effect on success according to common literature. However, according to Jacobsen (2006), the influence of location on actual success is relatively small. The influence of location on startup success is therefore rated as 1. The following hypothesis is put forward:

> H9a: The choice of location has an indirect very small influence on the company's success.

Financing is another success factor for startups in the strategy category. Access to traditional loan financing is often denied to startups (Croce et al., 2018). However, the amount and type of financing have a positive impact on the success of a company. Here, a distinction is made between the amount of startup capital and the type of financing (Jacobsen, 2006).

Similar to the life cycle of startups, financing goes through phases, so parallels can be drawn between the two cycles. In the case of startups, financing is often provided by the company's own funds in the pre-founding or founding phase. For example, the required financial resources are provided by the personal environment or by bootstrapping (Hahn, 2014). In the growth phase, investment by investors or business angels is usually necessary (Croce et al., 2018). The type of financing has an impact on the likelihood of survival of the startup. In their research, Croce et al. (2018) show that startups that have already received funding from a business angel are more likely to receive follow-on funding from investors and thus be able to move to the next startup phase and be more successful. Based on the literature review, the strength of influence of funding can be rated as 4 and the following hypothesis can be formulated:

> H10a: Financing by investors or business angels has a direct high influence on the company's success.

Operational planning as a criterion for strategy as a success factor is discussed diversely in the literature. The fundamentally positive influence is clearly affirmed in the broad base of the literature, but the effect is described in large parts as indirect. This is based on the finding that while a consistent business plan influences potential business partners and investors, the impact comes from specific content

within the business plan (Jacobsen, 2006). The business plan in its aggregate form is ultimately deci-sive, but the content is the starting point for indirect effect of planning. The influence strength of plan-ning is set at 4 and the following hypothesis is made:

H11a: The success factor planning has an indirect high influence on success.

Furthermore, the business model is regarded as a key success factor for startups in the strategy cate-gory. Startups fail time and again due to a deficient or non-scalable business model, even though there are market opportunities, a customer problem is addressed, sufficient resources and an innovative business idea are available (Morris et al., 2005). Creating, validating, and deploying an appropriate scalable business model has a very high impact (Strength 5) (Saebi et al., 2019; Baxter, 2016). The following hypothesis is formed:

H12a: The business model has a direct, very high influence on the success of startups.

The orientation of marketing is seen as an additional decisive factor of strategy. An inadequate market strategy is one of the main reasons for the failure of startups. This circumstance is due to the fact that market analysis for new products or services turns out to be difficult (Jacobsen, 2006).

With startups tending to have low funding, an effective marketing strategy becomes more important (Lingelbach et al., 2012). According to a study, a large proportion of investors also believe that a suit-able marketing strategy has a very high influence on success (Gruber, 2004). The strength of influence can be rated as 5 based on the literature statements.

H13a: The marketing strategy has a direct very high influence on the company's success.

4.2 Hypothesis model on the phase dependency of startup success factors

Based on the literature, it was possible to identify the above three categories (founder, situational oc-currence and strategy) and thirteen success factors for startups. Furthermore, an assessment of the influence strengths of the success factors could be obtained from the literature analysis. In addition, it was determined whether the success factors were direct or indirect. The results were manifested in thirteen hypotheses.

On this basis, a hypothesis model can be created, to which the temporal phases that startups classi-cally go through are added as a further characteristic. The success factors that have been identified to date are assigned to the phases in this model. This assignment is also based on the literature and is then empirically verified. Each category and success factor is assigned to the phase in which the strongest influence is identified.

For example, the situational incident category has the main influence in the pre-founding phase. The situational occurrence includes the factors innovation, founder motivation and time of market entry. These factors have great relevance even before the foundation (Dodge and Robbins, 1992).

Regarding the category founder person, it has already been noted that the influence is higher in the beginning than in the later development of the company (Spiegel et al., 2016). Furthermore, since challenge complexity is highest in the foundation phase, it can be assumed that founders have the greatest influence on success specifically in the foundation phase.

The strategy category can be predominantly assigned to the growth phase, as this requires the systematic further development of the company and factors such as business model, planning, financing and marketing are of high importance (Dodge and Robbins, 1992).

In order to concretize the hypothesis model, the success factors of the categories are now also assigned to the startup phases. Here, too, the logic applies that a phase is assigned if the factor's main influence on the success of this very phase takes place.

Since the success factors innovation, time of market entry and founder motivation primarily influence the basic business idea, which is a prerequisite for the success of a startup, these three success factors are attributed to the pre-foundation phase (Spiegel et al., 2016; Diehm, 2006).

Furthermore, human capital has a particular impact up to the time of market launch. Skills and abilities have the highest impact on business success at this stage (Egeln, 2010).

According to a study, the character and personality traits of the founders have an effect mainly at the beginning of the actual company development and can therefore be assigned to the foundation phase (Egeln, 2010).

The network mostly influences the decisions that are made immediately after the formal founding. In particular, establishment of relationships with Suppliers, customers and competitors are assigned to the foundation phase (Spiegel et al., 2016).

The team formation factor influences human capital, environment and network and their highest influence is therefore attributed to the formation phase. Environment also has the strongest influence in the foundation phase, as it is closely related to network and team formation (Jacobsen, 2006).

The factors of business model, financing, and marketing predominantly include the contents that primarily deal with the growth of the startup and are accordingly attributed to the growth phase (Asparaa, 2010). The choice of location and planning play a major role, especially in the preparation of the business plan, and can therefore be assigned to the pre-foundation phase (Diehm, 2006).

Overall, it can be stated that most success factors have the highest influence in the same temporal phase as the superordinate category. An exception is the choice of location and planning.

Based on the literature review, the following hypotheses can be derived based on the assignment of the categories and success factors to the startup phases:

- H1b: Personality traits have the highest influence in the foundation phase.
- H2b: Human capital has the highest influence in the foundation phase.
- H3b: Team foundations have the highest influence in the foundation phase.
- H4b: The environment has the highest influence in the foundation phase.
- H5b: The network has the highest influence in the foundation phase.
- H6b: The degree of innovation of the product/service has the highest influence in the pre-founding phase.
- H7b: The time of market entry has the highest influence in the pre-founding phase.
- H8b: The founder's motivation has the highest influence in the pre-founding phase.
- H9b: The choice of location has the highest influence in the foundation phase.
- H10b: Financing has the highest influence in the growth phase.
- H11b: Planning has the highest influence in the growth phase.
- H12b: Business model has the highest influence in the growth phase.
- H13b: Marketing strategy has the highest influence in the growth phase.

The sub-hypotheses H1a to H13a and H1b to H13b can each be combined to form a main hypothesis (Table 1).

Table 1: Summary of hypotheses of literature review

Hypotheses	Success Factor	Phase	Weighting
H12	Business model	Growth phase	5
H4	Environment	Foundation phase	5
H2	Human capital	Foundation phase	5
H6	Innovation	Pre-foundation phase	5
H13	Marketing strategy	Growth phase	5
H5	Network	Foundation phase	5
H7	Time of market entry	Pre-foundation phase	5
H10	Financing	Growth phase	4
H11	Planning	Pre-foundation phase	4
H8	Founder motivation	Pre-foundation phase	3
H1	Personality traits	Foundation phase	3
H3	Team foundations	Foundation phase	2
H9	Choice of location	Pre-foundation phase	1

In formulating the main hypotheses, the weighting, and the phases with the highest influence of the success factor are combined. In Table 1, the weighting was sorted in descending order.

Based on the analysis to date, the following theoretical-conceptual hypothesis model is created (Fig. 3), whose main statements on the influence of success factors and their phase assignment are empirically tested below.
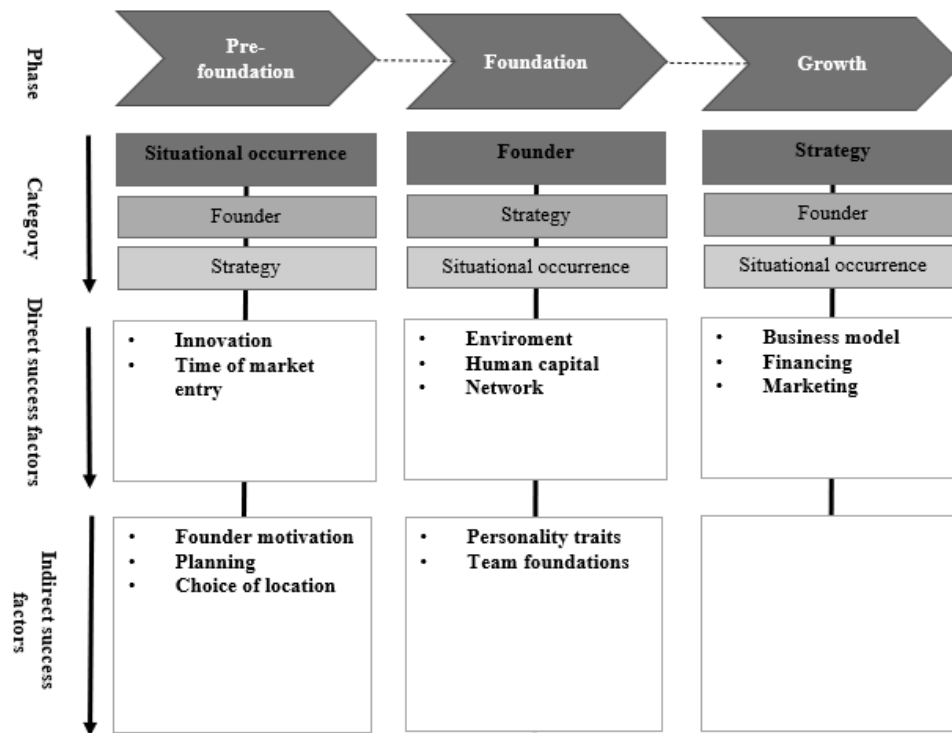
Figure 3: Prioritization of success factors taking into account of the phases of literature review

4.3 Verification of the hypothesis model through empirical observation

The success factors identified from the empirical study that are assigned a high to very high influence on corporate success are, in descending order: network, innovation, time of market entry, human capital, business model, marketing strategy and environment. The assignments are based on arithmetic averages based on respondents' assessments. Furthermore, the factors planning, financing, founder motivation, personality traits and team foundation were assessed with a medium level of influence on the success of the startup. The respondents see only a low influence in the choice of location. In the study, the influence of no success factor is rated as very low.

As a result of the empirical investigation, the success factors could be assigned to the temporal phases of startups as a supplement to the literature analysis. Thus, the influence emphasis lies the success factors environment, founder motivation, innovation and planning in the pre-foundation phase. The respondents attributed most of the success factors to the subsequent founding phase of startups. These include time of market entry, personality traits, human capital, team foundations, network, choice of location. In the subsequent growth phase, the success factors business model, marketing strategy and financing are of particularly high importance. It can be stated that influencing factors of the categories founder and situational circumstance tend to have their highest influence from the beginning to the middle of the startup's life cycle. Strategy and the associated decisions, on the other hand, have the greatest influence in the middle to end of the life cycle.

5   Concluding discussion

Hypotheses H1a to H13a, which arose from the literature analysis and relate to the strength of influence of the factors on the success of startups, are compared with the results of the empirical study in this regard. Figure 4 illustrates the overlaps and discrepancies between the two studies.
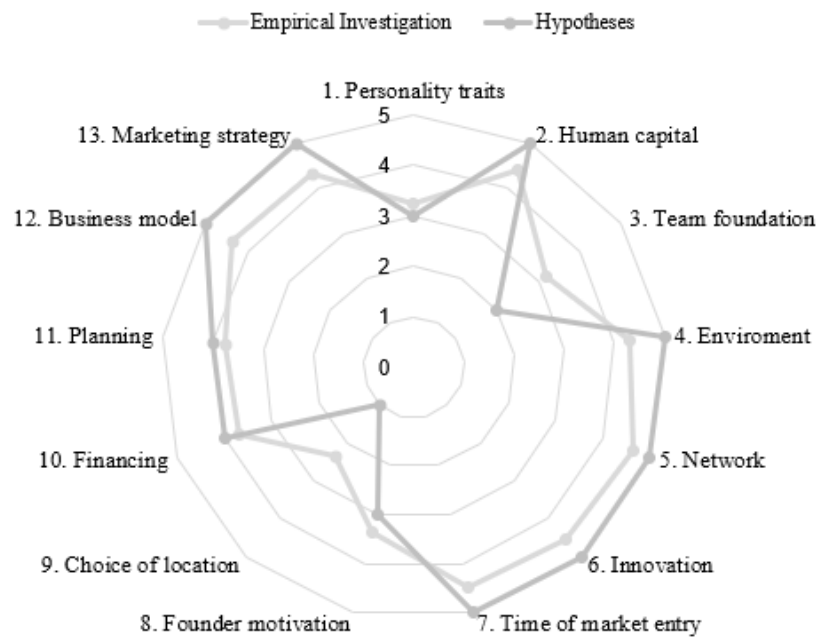

Figure 4: Comparison between hypotheses and empirical investigation of weighting

By comparing both models, the hypotheses can be mostly confirmed by the empirical study. It is found that the discrepancy between the results of the empirical study and the literature analysis for the individual factors is mostly between -1 and 1 scale points.

The clearest differences are found for the success factors team foundations and the choice of location. However, these differences are also rather small and significantly smaller than two scale points. It should be borne in mind that the literature study refers in part to studies conducted internationally, while the empirical study was conducted on startups in Germany. Regional and cultural differences may therefore be decisive for deviations to a manageable extent.

The possible assignment of success factors to the temporal phases of startups was also initially based on the literature analysis and recorded in hypotheses H1b to H13b. Figure 5 shows the comparison with the results of the empirical review.
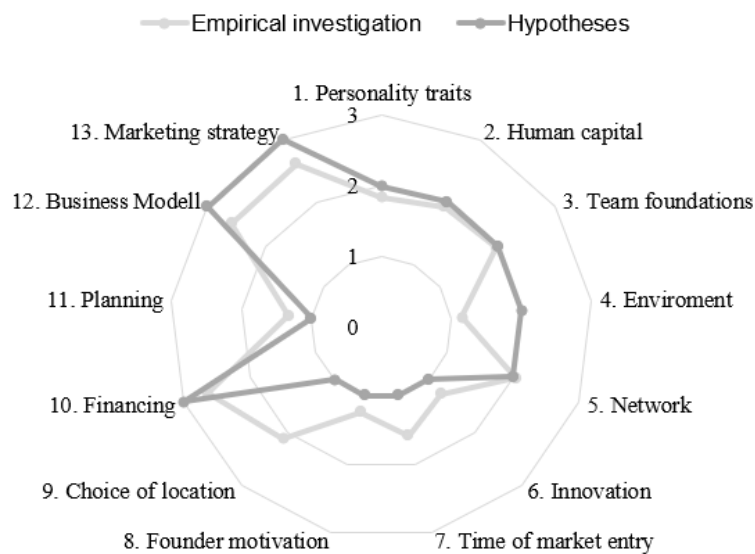
Figure 5: Comparison between hypotheses and empirical investigation of the phases

The highest discrepancy between the empirical study and the literature research in terms of temporal allocation is found in the success factors of choice of location and the environment. The respondents are predominantly of the opinion that the choice of location does not belong to the pre-founding phase, but to the founding phase. The environment, on the other hand, is assigned to the pre-founding phase in the empirical study instead of the founding phase, as assumed in the hypotheses. The remaining success criteria are evaluated by the respondents similarly to the hypotheses based on the literature.

One explanation for the difference in the environment could be the funding that the startups receive. Among the startups in the empirical survey, a part belonged to the German founder award winners. This part would potentially classify the environment in an earlier stage, because as a founder award winner one could already participate with a business idea that can be chronologically classified in the pre-founding phase. The difference in the planning success factor can be explained by the fact that the study participants are influenced, for example, by the planning uncertainty, during the Covid 19 pandemic. The other success criteria are assigned to the same temporal phases in the empirical study as well as in the literature research. The respondents' assessments tend to be broadly consistent with the hypotheses.

Based on the empirical review, the hypotheses of the literature research were adjusted in Table 2. The data are sorted in descending order of weighting. Nine of thirteen hypotheses remain valid. The four success factors of environment, planning, team formation and choice of location were adjusted in terms of strength of influence or temporal allocation.

Table 2: Comparison between hypotheses of literature review and empirical investigation

Hypotheses	Success Factor	Phase	Weighting
H5	Network	Foundation phase	5
H6	Innovation	Pre-foundation phase	5
H7	Time of market entry	Pre-foundation phase	5
H2	Human capital	Foundation phase	5
H12	Business Model	Growth phase	5
H13	Marketing strategy	Growth phase	5
H4	Environment	~~Foundation phase~~ Pre-foundation phase	5
H11	Planning	~~Pre-foundation phase~~ Foundation phase	4
H10	Financing	Growth phase	4
H8	Founder motivation	Pre-foundation phase	3
H1	Personality traits	Foundation phase	3
H3	Team foundation	Pre-foundation phase	~~2~~ 3
H9	Choice of location	~~Pre-foundation phase~~ Foundation phase	~~1~~ 2

The hypothesis model can be adapted according to the results of the empirical test and converted into a results model (Fig. 6).
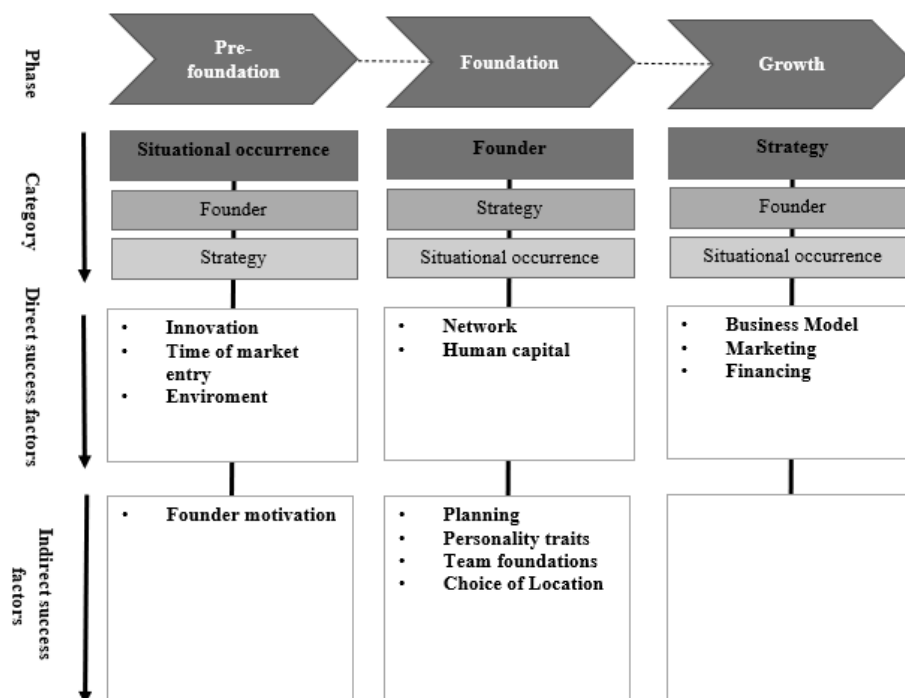

Figure 6: Final model for phase-dependent success factors for startups

The model visualizes the phase-dependent influencing categories and factors on the success of startups. The situational event category is particularly important in the first startup phase. In the middle time phase, this category is replaced by the Founder category, which then has a particularly strong influence. In the further growth phase, the strategy with the associated success factors gains relevance for the success of the startup.

The results model now makes it possible for startups to build up phase-dependent success factors in a targeted manner and to determine and secure the resource requirements in a targeted manner at an early stage in order to ensure the expression of decisive success factors at the defined point in time.

References

Albourini, F., Ahmad, A. M. K., Abuhashesh, M. Y. and Nusairat, N. (2010) ‚The effect of networking behaviors on the success of entrepreneurial startups', *Management Science Letters*, Vol. 10 No. 11, pp. 2521-2532.

Aspara, J., Hietanen, J. and Tikkanen, H. (2010) ‚Business model innovation vs replication: Financial performanceimplications of strategic emphases', *Journal of Strategic Marketing*, Vol. 18 No. 1, pp. 39-56.

Attahir, Y. (1995) ‚Critical success factors for small business: Perceptions of south pacific entrepreneurs', *Journal of Small Business Management*, Vol. 33 No. 2, pp. 68-73.

Baxter, R. (2016) ‚Subscription business models are great for some businesses and terrible for others', *Harvard Business Review*, 1-5.

Benzing, C., Chu, H. M. and Kara, O. (2009) ‚Entrepreneurs in Turkey: A factor analysis of motivations, success factors, and problems', *Journal of Small Business Management*, Vol. 47 No. 1, pp. 58-91.

Bundesverband Deutsche Startups e. V. (2020) *German Startup Awards*. [online] https://german-startupawards.de/nominierung/ (Accessed 06 December 2020)

Caliendo, M., Fossen, F. and Kritikos, A. (2014) ‚Personality characteristics and the decisions to become and stay self-employed', *Small Business Economics*, Vol. 42 No. 4, pp. 787-814.

Cordeiro, W. (2014) ‚Small businesses ignore strategic planning at their peril', *Academy of Business Research Journal*, Vol. 2 No. 3, pp. 22-30.

Cooper, A. C., Gimeno-Gascon, F. J. and Woo, C. Y. (1994) ‚Initial human and financial capital as predictors of new venture perfomance', *Journal of Business Venturing*, Vol. 9 No. 5, pp. 371-395.

Cotei, C. and Farhat, J. (2017) ‚The Evolution of Financing Structure in U.S. Startups', *The Journal of Entrepreneurial Finance*, Vol. 19 No. 1, pp. 1-32.

Covin, J. and Slevin, D. (1991) ‚A conceptual model of entrepreneurship as firm behavior', *Entrepreneurship Theory & Practice*, Vol. 16 No. 1, pp. 7-26.

Croce, A., Guerini, M. and Ughetto, E. (2018) ‚Angel financing and the performance of high-tech startups', *Journal of Small Business Management*, Vol. 56 No. 2, pp. 208-228.

Dealroom (2020) *Dependency on foreign investors could become a problem for (German) startups*, [online] Senate Department for Economics, Energy and Public Enterprises, Berlin. https://dealroom.co/reports/dependency-on-foreign-investors-could-become-a-problem-for-german-startups (Accessed 11 May 2021)

Deutscher Sparkassen- und Giroverband e. V. (2020) *Deutscher Gründerpreis*. [online] https://www.deutscher-gruenderpreis.de/preistraeger/ (Accessed 06 December 2020)

Diehm, J. (2017) *Controlling in Start-up-Unternehmen*, 2nd ed., Springer Gabler, Wiesbaden.

Dodge, R. and Robbins, J. (1992) ‚An empirical investigation of the organizational life cycle model for small business development and survival', *Journal of Small Business Management*, Vol. 30 No. 1, pp. 27-37.

Eberle, G. (2004) *Business Inkubation und erfolgreiche Exit-Strategien*, Kovac, Hamburg.

Egeln, J., Falk, U., Heger, D., Höwer, D. and Metzger, G. (2010) *Ursachen für das Scheitern junger Unternehmen in den ersten fünf Jahren ihres Bestehens*, ZBW, Mannheim.

Engelen, A. et al. (2015) *Corporate Entrepreneurship*, Springer, Wiesbaden.

Fallgatter, M. (2004) ‚Entrepreneurship: Konturen einer jungen Disziplin', *Schmalenbachs Zeitschrift für betriebswirtschaftliche Forschung*, Vol. 56 No. 1, pp. 23- 44.

Frese, T. (2014) *Entscheidungsfindung in jungen Unternehmen*, Springer, Wiesbaden.

Frese, M., Brantjes, A. and Hoorn, R. (2002) ‚Psychological success factors of small scale business in Namibia: The roles of strategy process, entrepreneurial orientation and the environment', *Journal of Developmental Entrepreneurship*, Vo. 7 No. 3, pp. 259-282.

Freudenthaler-Mayrhofer, D. and Sposato, T. (2017) *Corporate Design Thinking : Wie Unternehmen ihre Innovationen erfolgreich gestalten*, Springer, Wiesbaden.

Groenewegen, G. and de Langen, F. (2012) ‚Critical success factors of the survival of start-ups with a radical innovation', *Journal of Applied Economics and Business Research*, Vol. 2 No. 3 , pp. 155-171.

Gruber, M. (2004) ‚Marketing in new ventures: Theory and empirical evidence', *Schmalenbach Business Review*, Vol. 56 No. 2, pp. 164-199.

Hahn, C. (2014) *Finanzierung und Besteuerung von Start-up-Unternehmen*, Springer, Berlin.

Hirschfeld, A., Gilde, J. and Wöss, N. (2020) *Female Founders Monitor*. [online] Bundesverband Deutsche Startups e. V., ISBN 978-3-9819968-8-3.

Jacobsen, L. (2006) *Erfolgsfaktoren bei der Unternehmensgründung*, Deutscher Universitäts-Verlag, Wiesbaden.

Kollmann, T., Jung, P. B., Kleine-Stegemann, L., Ataee, J. and de Cruppe, K. (2020) *Deutscher Startup Monitor 2020 – Innovation statt Krise*, Bundesverband Deutscher Startups e. V., ISBN 978-3-948895-04-4.

Kollmann, T., Michaelis, A. and Waldau, B. (2014) *Startup-Verzeichnis NRW*. [online] Digitale Wirtschaft NRW, Cluster IKT.NRW. https://www.wirtschaft.nrw/sites/default/files/asset/document/startup-verzeichnis_nrw.pdf (Accessed 21 May 2021)

Käufer, T. and Conell, M. (2021) *Startup Quarterly – Q4/2020*, [online] Statistical report did-85630-1, Statista. https://de.statista.com/statistik/studie/id/85630/dokument/startup-quarterly-q4-2020/ (Accessed 11 May 2021)

Kumbhat, A. and Sushil (2018) ‚Development stages and scaling issues of startups' in Dhir, S. and Sushil (Eds.), *Flexible strategies in VUCA markets*, Springer, Wiesbaden, pp. 3-15.

Lingelbach, D., Patino, A. and Pitta, D. A. (2012) ‚The emergence of marketing in millennial new ventures', *Journal of Consumer Marketing*, Vol. 29 No 2, pp. 136-145.

Lussier, R. (1995) ‚A nonfinancial business success failure prediction model for young firms', *Journal of Small Business Management*, Vol. 33 No. 1, pp. 8-20.

Lussier, R. and Halabi, C. (2010) ‚A three-country comparison of the business', *Journal of Small Business Management*, Vol. 48 No.3, pp. 360-377.

Maier, M. and Ivanov, B. (2018) *Selbstständige Erwerbstätigkeit in Deutschland*, Zentrum für Europäische Wirtschaftsforschung, ISSN 0174-4992.

McDougall, P. P., Robinson, R. and DeNisi, A. S. (1992) ‚Modelling new venture performance: An analysis of new venture strategy', *Journal of Business Venturing*, Vol. 7 No. 4, pp. 267-289.

Morris, M., Schindehutte, M. and Allen, J. (2005) ‚The entrepreneur's business model: Toward a unified perspective', *Journal of Business Research*, Vol. 58 No. 6, pp. 726-735.

O'Reilly, C. and Binns, A. (2019) ‚The three stages of disruptive innovation: Idea generation, incubation, and scaling', *California Management Review*, Vol. 61 No. 3, pp. 49-71.

Prasad, K. V., Ehrhardt, K., Liu, Y. and Tiwari, K. (2015) ‚Examining the age-performance relationship for entrepreneurs: Does the innovativeness of a venture make a difference?', *New England Journal of Entrepreneurship*, Vol. 18 No.1, pp. 41-57.

Rammer, C. and Peters, B. (2010) ‚Innovationen und Beschäftigung in verschiedenen Konjunkturphasen', *ZEW Wachstums- und Konjunkturanalysen*, Vol. 13 No. 2, pp. 8-9.

Ricken, B. and Seidl, D. (2010) *Unsichtbare Netzwerke: Wie sich die soziale Netzwerkanalyse für Unternehmen nutzen lässt*, Springer, Wiesbaden.

Saebi, T., Foss, N. J. and Linder, S.(2019) ‚Social entrepreneurship research: Past achievements and future promises', *Journal of Management*, Vol. 45 No. 1, 70-95.

Sandberg, W. (1986) *New venture performance: The role of strategy and industry structure*, Lexington, Mass.

Sapienza, H. and Grimm, C. (1997) ‚Founder characteristics, start-up process, and strategy/structure variables as predictors of shortline railroad performance', *Entrepreneurship Theory & Practice*, Vol. 22 No. 1, pp. 5-24.

Schnedler, J. (2020) *Startup-Recht: Praktischer Leitfaden für Gründung, Unternehmensführung und -finanzierung*, O'Reilly, Heidelberg.

Scott, M. and Bruce, R. (1987) ‚Five stages of growth in small business', *Long Range Planning*, Vol. 20 No. 3, pp. 45-52.

Song, L., Song, M. and Parry, M. E. (2010) ‚Perspective: Economic conditions, entrepreneurship, first-product development and new venture success', *Journal of Product Innovation Management*, Vol. 27 No. 1, pp. 130-135.

Spiegel, O., Abbassi, P., Zylka, M. P., Schlagwein, D., Fischbach, K. and Schoder, D. (2016) ‚Business model development, founders'social capital and the success of early stage internet start-ups: A mixed-method study',*Information Systems Journal*, Vol. 26 No. 5, pp. 421-449.

Street, C. and Cameron, A. (2007) ‚External relationships and the small business: A review of small business alliance and network research', *Journal of Small Business Management*, Vol. 45 No. 2, pp. 239-266.

Teece, D., Peteraf, M. and Leih, S. (2016) ‚Dynamic Capabilities and Organizational Agility', *California Management Review*, Vol. 58 No. 4, pp. 13-35.

Vanacker, T., Manigart S., Meuleman, M. and Sels, L. (2011) ‚A longitudinal study on the relationship between financial bootstrapping and new venture growth', *Entrepreneurship & Regional Development*, Vol. 23 No. 9-10, pp. 681-705.

Walgenbach, G. (2008) *Die Vorteilssituation von Innovatoren auf elektronischen Märkten: Strategische Relevanz des frühen Markteintritts am Beispiel des Online-Buchhandels*, Springer, Wiesbaden.

Wendt, P. (1972) ‚Deciding on location for a small business', *Journal of Small Business Management*, Vol 10 No. 1, pp. 1-4.

Yang, J. and Aid, D. (2019) ‚Effect of the Big Five Personality traits on entrepreneurial probability: Influenceof China's household registration system', *Journal of Labor Research*, Vol. 40 No. 3, pp. 487-503.

Zare, M. and Flinchbaugh, C. (2019) ‚Voice, creativity, and big five personality traits: A meta-analysis', *Human Performance*, Vol. 32 No. 1, pp. 30-51.

Zhou, L. and Farquharson, M. (2016) ‚Human capital of returnee entrepreneurs: A case study in China' *Journal of Enterprising Culture*, Vol. 24 No. 4, pp. 391-418.