Factors determining follow-up success for startups receiving TOP loan funding

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Fundraising is a crucial step in startup survival, which leads to considerable time being spent on it. Especially in the early stages of a startup's life it is harder for a startup to receive funds. This is where the TOP loan from the University of Twente can come in handy. This is a €40,000 loan under terms more agreeable for startups, compared to loans from commercial institutions. There is ample research on startup financing in all stages of the startup life-cycle, but most research on specifically the TOP loan is primarily done for marketing purposes. This paper aims to answer what factors in the TOP loan assessment are related to forms of success after being granted the TOP loan. The methodology to achieve this consists of a combination of unstructured literature review, expert interviews and data analysis of assessment scorecards from companies which have received the loan. The results show the factors which influence VC (Venture Capitalist) decision making and follow-up success. It also shows the effectiveness of the TOP loan assessment in measuring investor readiness, and what specific factors influence employee count, follow-up funding and survival rates. These results can be useful for the administrators of the TOP loan, Novel-T, to gain insights on the TOP loan and for startups to better understand how to receive the TOP loan and how to use it as a foundation for future success.

Additional Key Words and Phrases: Startup, Startup success, TOP loan, Startup finance, Startup financing, Venture capital

1 INTRODUCTION

Founding a new startup can be a very capital-intensive process, and startups need capital to reach their optimal amount of growth [1]. Despite the crucial importance of capital for these businesses, finding the right avenue of funding often is a major challenge [2]. Due to this, funding is the highest priority for startups, behind product definition and the core people [3]. There are many avenues for startups to get funding, ranging from bootstrapping to venture capital to crowd-sourcing [1]. When it comes to venture capital, macroeconomic factors impact the supply of venture capital greatly, which can lead to a startup wanting to raise funds not being able to stemming from factors beyond their control [4]. Different sources of funding have different benefits and drawbacks. In earlier life-stages startups tend to be less sensitive to the cost of capital and losing autonomy, while prioritising coaching and scouting [3]. In this paper the definition from [3] is used to define an early-stage startup. "It is the beginning of the process of new venture creation, where the startup is searching for a business model, trying to co-create the business concept, among a few members and reach the product-market fit." [3, p. 3]

For entrepreneurs affiliated with the University of Twente (UT), there is an attractive option in what is referred to as the TOP loan. This is a €40,000 loan offered to innovative startups, combined with coaching and scouting through Novel-T, a local entrepreneurship non-profit, founded by the UT and other regional institutions [5]. The TOP loan has a four year term, of which the first two years are interest-only, with an interest rate of 7.75%, which is lower than likely market rates at the time of writing. See Appendix A for further information on the interest rates.

The basic conditions to receive the TOP loan are as follows: The company has not existed for more than five years; The company must have an innovative and scalable business model; The business has not applied for and been granted a TOP position in the past; The business demonstrably contributes to the economic development of the East Netherlands region; There is a sustainable connection between the company and the University of Twente [5]. The way the decision is made for a company to get the TOP loan is by a committee, which decides if the business model is good and if the team is able to execute it. The committee uses an assessment scorecard to support this decision.

This assessment looks at seven important factors for startup success, shown in Table 1.

Factor	Description
Good teams	Committed entrepreneurs with relevant domain knowledge and a strong track record, as well as complementary expertise.
Strong execution	Teams with ambition and a solid go-to-market/growth strategy, capable of identifying and managing risks.
Growth potential	Startups with growth potential, both domestically and internationally, and a scalable business model.
Large market opportunity	Startups targeting a clearly defined and growing market.
Clear and attractive value proposition	Startups solving a painful problem for the customer and able to demonstrate market demand.
Strong competitive advantage	Startups with a superior value proposition that can be protected from competitors, and capable of securing an attractive position in their value chain.
Interesting investment opportunity	Startups with credible and attractive financial projections and exit potential.

Table 1. Assessment scorecard factors, taken from [6]

2 PROBLEM STATEMENT

Research has been done on the recipients of the TOP loan by Novel-T. However, most of this research has been surface level and primarily done for marketing purposes. In the trajectory before being granted the TOP loan Novel-T offers support to help adapt the business and financial plans, which comes in the form of coaching by an assigned coach using their tacit knowledge. Furthermore, most of the support offered is before the TOP loan is granted, meaning that steps to take and priorities to have after the grant might be less clear for startups. According to de Croes [7], investment specialist at Novel-T, the assessment scorecard used is based on research done by Mensink [8]. A limitation found by Mensink is the lack of an

explicit connection between their results and success achieved by startups after the investment decision. Mensink suggests to base further study on [9]. Lastly, while there is ample research on startup success, there is currently no link between this existing research and the reasoning behind the setup of the TOP loan.

2.1 Research questions

The **main research question** is as follows: *What factors in the TOP loan assessment for startups influence relatively high success probabilities?*

Sub research questions: To answer the main research question, the following sub questions are answered:
1. To what extent are the chosen factors of the TOP loan assessment supported by evidence?
2. What are the factors which lead to follow-up startup success?
3. What is the correlation between assessment scores and follow-up startup success?

3 RELATED WORK

Startup success is a well-researched topic [10], with various approaches such as studying the venture capitalists (VC) process [9, 11, 12], investigating the entrepreneurs and their decision making [13] and machine learning [14] being used. Startup fundraising has been a heavily researched topic as well. According to [1], the research tends to be in-depth research on different avenues of funding. A literature review has been done to create a holistic view of the startup funding landscape [1]. Existing research tends to focus on specific regions, as factors such as the presence of universities as a growth engine is highly regionalised. The same goes for support services, entrepreneurial expertise and social support structures, which can be provided by regional incubators [15].

4 METHODOLOGY

To answer subquestions 1 and 2 an unstructured literature review is done. To find relevant literature, academic literature databases, primarily scopus, is used. This consists of keyword searches and both forward and backward citation searches. Special attention is paid to [16], as that paper forms much of a basis for [8] by pioneering questionnaire-based in VC investment criteria. [9], which analyses the relationship between VC investment criteria and follow-up success, was also thoroughly investigated based on recommendations by [8].

In addition to unstructured literature review, two informal, unstructured, expert interviews with Novel-T staff are held to tap into the organisational knowledge and give a better context for the researcher, in addition to clearing up small questions.

To answer subquestion 3, linear regression analysis is conducted on the assessment scorecards provided by Novel-T, combined with information gathered on these companies by Novel-T. The dataset on which the analysis is done consists of the assessment scorecards, which take the form of a rubric with scores of 0%, 33% or 100% being possible (higher is better). The scorecard takes the seven factors from Table 1 and has 15 proprietary, specific criteria. These get combined into five categories, which the final data analysis makes use of. The category scores are used for the data analysis to find correlations with the amount of follow up funding (from VCs, loans, subsidies, grants or other sources), whether the company is still in business (either independently or having been taken over by another company) and their amount of FTE. These success outcomes were chosen based on the availability of these data points in the dataset.

5 RESULTS

In this section, the subquestions are answered in three separate sections.

5.1 Subquestion 1

Subquestion one is answered by first analysing the study which the TOP loan assessment is based on. The method and other studies with similar methods are looked at. Secondly, Dutch VC results are looked at with a more detailed view. Lastly, the way the assessment scorecard implements these results is analysed.

5.1.1 Literature review on VC investment factors. The assessment scorecard used by the TOP committee is based on [8]. In turn, [8] is inspired by [16]. The assessment scorecard is made to score the investor readiness for startups, aligning with the scope of Mensink's paper, which looks at what factors VCs find important to make an investment decision. Mensink conducted preliminary questionnaires, semi-structured interviews and final questionnaires. The group receiving questionnaires and being interviewed were VCs based in the Netherlands, Sweden and Singapore. The final questionnaire in [8] is based on his preliminary questionnaire, the semi-structured interviews and [12, 17–20]. These sources, combined with [16] and expert consultation, provided 76 relevant questions which together form the final questionnaire of [8]. VCs were asked to rank the importance of the individual factors on a 5 point Likert scale, with 1 being the least important and 5 being the most important. In total, 33 final questionnaire responses were received. Only the Dutch VC responses (N = 12) were looked at in [8] because of its relevance for the TOP loan. Mensink categorised the factors into five more general groups, visible in Figure 1 together with their group mean.

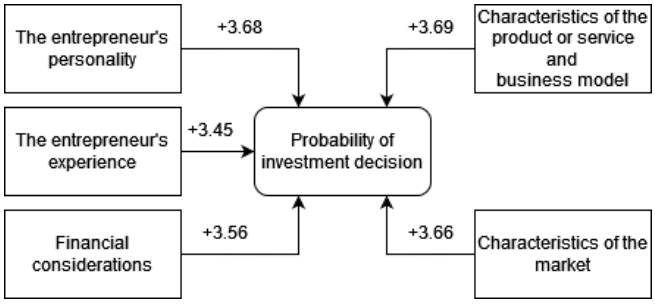

Fig. 1. Dutch VC survey results from [8], numbers based on a 5 point Likert scale

Studies with similar methods based on [16]'s method have been done since the release of the Mensink paper in 2010, with samples from South Africa [21], Portugal [22], Central Eastern Europe (CEE) and Russia [23]. Earlier, [17] was conducted in 1994, but also uses

a similar methodology. The results in these studies differ between different countries and regions and can be seen in Table 2. There has been an ongoing debate whether VCs find the horse race (market), the horse (product), odds (financial factors) or the jockey (the entrepreneur[1]) [16]. It is clear that the answer to the 'jockey or horse' debate is the jockey (entrepreneur) in most countries, meaning VCs put most value on the entrepreneur. The Netherlands is an outlier, being the only country looked at in this research where the product/service is more important. One could speculate this is due to Dutch Calvinist cultural norms, where "doing normal" is valued by society, and thus the business should be able to speak for itself instead of the entrepreneur. Similarly, [24] has found that in Asia the investment opportunity (combination of product, financial and market factors) takes precedence over the entrepreneur and makes the connection to cultural norms. The South Korean results from [17] and the Singaporean results from [8] seem to directly contradict this. However, in their meta-analysis, [24] has found that there is a "very high variance" and identified "wide confidence intervals". This seems in line with the variety of results from studies examined in this paper. In turn, Mensink found that, as a category, the entrepreneur's personality related factors score high in all countries, but individual factors related to the product and market have the highest scores and have higher rejection rates (meaning a VC will reject a proposal if a certain factor is not present). The rankings in Table 2 seem to support his first conclusion, but [16, 17, 21–23] are not in line with the notion of many individual product and/or market related factors scoring higher. Important to note is that that only [16, 17] have looked into rejection criteria as well. In the USA, [16] has found that, entrepreneur related factors would be reason to reject a project. In South Korea, [17] found that market attractiveness is the most important rejection criterion. This type of methodology has received criticism from academia. The usage of questionnaires filled in by the VCs themselves has led to the question whether "these methods can lead venture capitalists to report how they believe they decide, instead of reporting how they actually reached decisions" [25]. A limitation found by [25] is that this type of research tends to be more of use for entrepreneurs and not to VCs looking to optimise their investment processes.

5.1.2 Dutch VC results of the Mensink paper. Out of the 76 total factors in the questionnaire, Mensink found 10 to be *main findings* due to them being either highest, or lowest scored. These are shown in Tables 3 and 4.

Rank	Factor	Mean
1	The revenue model is scalable	4.83
2	The technology is scalable	4.67
3	The entrepreneur can demonstrate a market demand	4.67
4	The target market has a large growth potential	4.67
5	People will pay for the product	4.64

Table 3. Dutch main results from [8]: the 5 highest scoring factors (5 point Likert scale)

[1]In literature the term entrepreneur (singular) is used often as a synonym for team, or entrepreneurs (plural), which this paper does as well.

Rank	Factor	Mean
76	The product is different than the trend in the market	1.92
75	The venture will create a new market	2.33
74	I am already familiar with the entrepreneur's reputation	2.58
73	The venture found a niche market	2.64
72	Has a personality compatible with mine	2.67

Table 4. Dutch main results from [8]: the 5 lowest scoring factors (5 point Likert scale)

The focus of Dutch VCs on scalability is noticeable. [26] has found that the VC experience and education level are positively correlated with the importance VCs put on (international) scalability. This could imply that Dutch VCs often have a higher education level or more experience in the VC business. [26] theorises that "a higher level of education increases the awareness of decision makers regarding international scalability as an indicator of the potential of a venture's business idea" and names international scalability as an important step in exploiting growth opportunities and increasing profitability. The top 5 most important factors seem to come down to one thing: the VC wants to see a large, proven, market with a product and business model which is able to capture it entirely. Whether the VC knows of the reputation of the entrepreneur, if the venture has found a niche market, or even will create a new market is not very desirable to VCs. Going against the current trend in the market is seen at the least desirable for VCs.

5.1.3 Implementation of Mensink's results into the assessment scorecard. The assessment scorecard is weighted in roughly the same way as the results from [8], with most importance being given to scalability, growth potential and financial prospects. The relatively most and least important factors are shown in Table 5.

Most Important	Least Important
Scalability	Market Growth
Growth Potential	Protection of the Value Proposition
Financial Prospects	Assumptions the Financials are Based On
	Business Position in the Value Chain

Table 5. Assessment factors ordered by weights

A limitation of the Mensink paper is that the scope only includes VCs making investment decisions on IT & Internet companies. The TOP loan, however, frequently gets awarded to companies in other sectors. For example, business model protection (e.g. through patents) is not a priority in the TOP loan assessment (part of *Strong competitive advantage* in the assessment scorecard), because software is very hard, if not impossible to patent in a useful manner in the EU. This is because Article 52 of the European Patent Contention explicitly excludes "programs for computers" as inventions when applying for a European patent [27], meaning they cannot receive patent protection in the EU. But for high-tech non-IT startups, "patents constitute a very important advertising mechanism" when

Country/region	Source	Publication Year	The Entrepreneur's Personality	The Entrepreneur's Experience	Characteristics of the Product or Service	Characteristics of the Market	Financial Considerations
USA	[16]	1985	1	2	3	4	5
South Korea	[17]	1994	1*		2	3	4
Netherlands	[8]	2010	2	5	1	3	4
Singapore	[8]	2010	1	5	3	4	2
Sweden	[8]	2010	1	5	3	2	4
South Africa	[21]	2013	1*		2	3	4
Portugal	[22]	2014	1	2	4	3	5
CEE	[23]	2015	3*		2	1	4
Russia	[23]	2015	3*		2	1	4

Table 2. This table shows the relative ranking of factors to VCs in different geographies. 1 = most important, 5 = least important.
*The source combines the entrepreneur's personality and experience into one category

applying for venture capital [28]. An example is the nanotechnology [29] sector, where patents have been found to have a "positive and significant" influence on VC funding. An important caveat is that patents being granted do not necessarily mean the entire value proposition can be protected, nor do VCs actually see usefulness in patents for more than merely protecting a specific technology [28].

The design of the assessment might be biased towards IT & Internet companies, because by nature software is often very scalable, where instead of setting up new production processes, the company can rent more server capacity seamlessly. Moreover, the lower weighing of Market Growth might negatively impact companies that are in a very young market with many unknowns.

5.2 Subquestion 2

Subquestion 2 is answered by first taking the suggestion of [8], to study [9]. Then, further literature review is conducted to find ways to define what success is, and define limitations on what can be considered success and finally, to come up with a comprehensive overview which shows the complex relationship between success factors and firm performance.

5.2.1 Literature review on definitions of success. As mentioned in Section 2, Mensink [8] notes that his research "does not address whether the criteria are actually helpful in distinguishing successful from unsuccessful ventures" and suggests to base further study of this topic on the research by [9]. That study found that only two factors predict performance consistently, namely the degree of competitive threat and the degree of market acceptance of the product. The authors of [9] do mention the limitations of self-reporting and the methodology bias but nonetheless came to the conclusion that high-ranking the factors found by them two years earlier in [16] do not predict success as well as they predict VC investment likelihood. However, they say this is "because the venture capitalists had already applied them to weed out undesirable ventures". Another limitation is that the definition used for success was totally arbitrary. The respondents (VCs) in their questionnaire chose one successful venture and one unsuccessful venture they invested in themselves. [13] found that not only the entrepreneur is important, it also found that multi-entrepreneur teams are positively correlated with success. Moreover, the time spent in the planning phase is also positively correlated with success, and more often outside professionals (such as consultants, lawyers or accountants) were involved in successful ventures. [13] classified a successful venture as having "pretax profits and owners' salaries combined of over $35,000 annually". This definition was decided a posteriori, based on the data they gathered from their results. The sample consisted of ventures in the fruit juice sector, which cannot be generalised without further substantiation. Entrepreneurs and VCs also disagree amongst each other what traits a successful entrepreneur has [30]. Entrepreneurs tend to emphasize attributes they are born with (such as creativity or persistence) of the entrepreneur, while VCs give successful entrepreneurs a more balanced trait set [30]. For clarity, in this paper we view the concept of *success* only through the lens of the company. This rules out definitions and studies where the perception of the entrepreneur is the main focus, such as [31, 32]. Importantly, entrepreneurs can also work outside the context of a startup. The definition from [33], namely "a human institution designed to create new products and services under conditions of extreme uncertainty" [34]. An important distinction here is *new* products and services, which excludes more traditional businesses such as bakeries or restaurants, as much as their founders and/or owners are still entrepreneurs.

5.2.2 Literature review on the relationship between success factors and firm performance. In literature the term *firm performance* gets used, and this is the term we use as well. We investigate seven firm performance success outcomes. The performance success outcomes are profitability (as measured by profitability [35], profit, Return on Investment [36] and Return on Sales [37]), free cashflow[2] [39], sales volume (measured by sales revenue and market share [36]), efficiency (measured by Return on Assets and Return on Employees [37]), growth (measured by growth in assets [37], employees [37, 40, 41] and sales [41, 42]), the valuation of the venture (measured by Internal Rate of Return [43, 44] and exit performance [45]), survival rates (arbitrarily defined by [40, 46]. VC financing [41, 46] acts as

[2]The relationship between profitability and free cash flow (FCF) is taken from [38], who proposed the following formula for FCF:

$$FCF = OperationalCashflow - CapitalExpenditures - DebtPayments$$

a mediator variable. The relationships between the measurements and success factors can be seen in Figure 2.

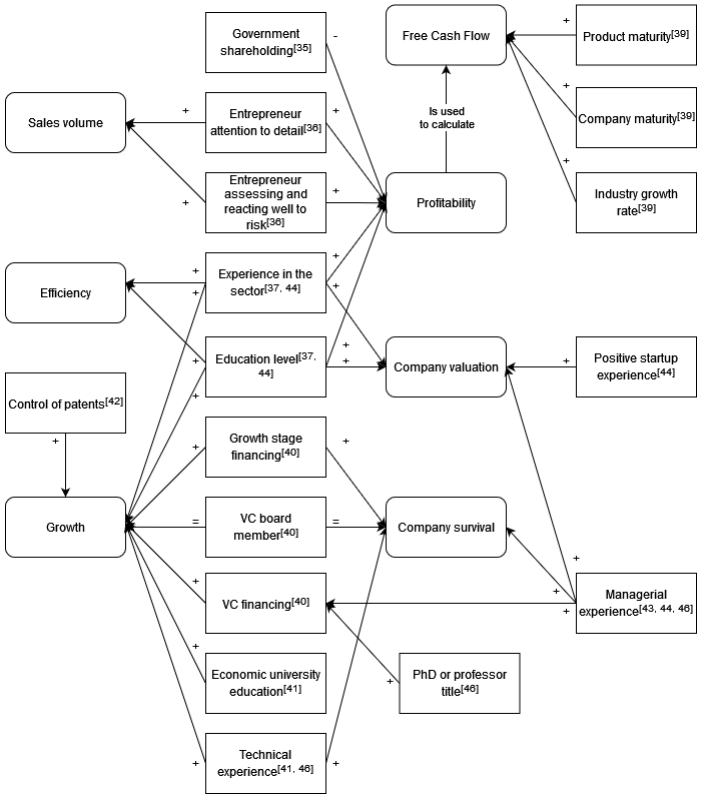

Fig. 2. Relations between success factors and success outcomes. Factors in rectangles, outcomes in rounded rectangles.
+: positive relationship, =: no positive nor negative relationship, -: negative relationship.

5.2.3 Discussion on subquestion 2. As Figure 2 shows, the relationships between the measurements and success factors are complex. Some of the complexity stems from authors using many different measurements for success. Many of these are categorised in Figure 2, such as the growth in employee count and the growth of assets being categorised into growth. Many of the studies have been undertaken with specific scopes, such as [35] limiting themselves to the nuclear and space industry in Russia, and [42] having a scope limited to technology based manufacturers at the time of their Initial Public Offering (IPO). It is clear is that traits and signals proxying for the entrepreneurs' intelligence, namely education and the entrepreneurs' attention to detail and risk management, have positive correlations with all success outcomes except company survival, where it should be noted that none of the studies which looked at company survival also looked at education, attention to detail and risk management. Generally speaking, education tends to be a relatively good predictor for venture success. However, the entrepreneur having a PhD or professor title does not increase the likelihood of venture survival [46]. It does increase the likelihood of VC financing, which in turn positively affects growth. If this financing was done in the growth stage it did have a positive correlation with venture survival. This, in turn can also be a case of survivorship bias, because firms which have better plans are able to make it to the growth stage. Another problem with using VC financing as a factor is selection bias. VCs usually only finance companies with solid plans and competent entrepreneurs [16], hence the presence of VC financing could be seen more as a signal than as a cause of success. This dynamic is shown in Figure 3.

Fig. 3. Proposed feedback loop showing the interaction between selection and survivorship bias in VC financing

Experience, whether in the specific sector the startup works in or more general management or technical experience, also is a good predictor for startup success. Entrepreneurs who have founded a startup before also are more likely to achieve success. However, [37] found that having prior unsuccessful managerial, entrepreneurial or startup experience is negatively correlated with their new firms' return on assets and return on employees.

These findings show the complexity of the topic of startup success. There are many correlations between factors, but it is unclear whether these can be generalised between studies and geographies. This might be a reason why VCs approach their process as an art instead of a science, relying on *fingerspitzengefühl*, or in the words of [16], *gut feeling*.

5.3 Subquestion 3

Subquestion 3 is answered by using linear regression to find the relationship between the five assessment scorecard categories as discussed in Section 4 (execution, growth, market opportunity, value proposition and competitive advantage) and FTE (Full-Time Employee equivalent to account for part-time employees) count, follow up financing and whether the company is still active. The five assessment scorecard categories are used as independent variables and as dependent variables the FTE count, follow-up funding amount and still active status are used. IBM SPSS Statistics is used to clean up the dataset and to come to the results as visible in Table 7. Descriptive statistics about the sample(s) are shown in Table 6. The sample consists of 77 companies which have been awarded the TOP loan since 2011 up to and including 2023. 73 TOP loan recipients received €40,000, with exceptions where two received €20,000 and two received €10,000. To analyse the FTE count of recipients, only companies which are still in business and which had available data are sampled.

Noticeable are the large standard deviations of the success outcomes. This is an expected result for the amount of follow-up funding, due to the high outliers and high number of values which are zero, or close to zero in comparison to the mean. The results of the

Success outcome	Mean	Std. Deviation	N
Number of FTE	5.60	5.47	48
Amount of follow-up funding	€1,218,321	€3,026,069	77
Still active? (boolean)	0.68	0.47	77
Categories used for FTE count analysis			
Execution	0.58	0.21	48
Growth	0.66	0.24	48
Market opportunity	0.65	0.24	48
Value proposition	0.65	0.19	48
Competitive advantage	0.46	0.18	48
Categories used for follow-up funding & still active analysis			
Execution	0.58	0.21	77
Growth	0.67	0.23	77
Market opportunity	0.65	0.24	77
Value proposition	0.61	0.21	77
Competitive advantage	0.45	0.21	77

Table 6. Descriptive statistics of dataset.

linear regression generally show weak correlations between higher scorecard scores and success outcomes. The growth category score is significantly ($p < 0.05$) positively correlated with the number of FTEs employed by the recipient. The FTE count has been used as a measurement of growth by [37, 40, 41], showing that theory and the data align. The strongest correlation is between the value proposition category score and the FTE count. The value proposition category score is also highly significantly correlated ($p < 0.01$) with venture survival. This could be because ventures which provide a clear value to their customers have a more loyal customer base, which in turn creates stability. This is also the only significant predictor for company survival that was found in our analysis. The amount of follow-up funding and the growth category score have the highest and most significant correlation for the success outcome. This is a confirmation that VCs find growth (which includes scalability and growth potential) and the market opportunity (which create good financial prospects) the most important, as discussed in Section 5.1.2. However, the competitive advantage category also has a significant positive correlation, even though this comprises some of the least important factors to VCs, such as business model protection, and the position in the value chain. Lastly, the correlation between the categories and the business being still active have two negative correlations, namely between the execution category and growth category. Even though these results are not significant (execution category has $p > 0.1$, growth category has $p < 0.1$), it could be reasoned that companies which are based on high growth are inherently more risky, which would explain the correlation.

6 DISCUSSION & RECOMMENDATIONS

This section discusses the limitations of our study, examines its relevance for stakeholders, provides recommendations, and suggestions for further research.

6.1 Limitations of this study

This study has some specific limitations and biases which need to be addressed. The early research done on VC investment criteria has been criticised in the past for the usage of questionnaires, due to their self-reporting bias [25]. VCs have been found to also suffer from similarity bias [47] and availability bias [48], which can impact their (perceived) decision making, also influencing studies with other methods which aim to remove self-reporting bias, such as [18]. Another problem is with generalisation, because the investment criteria of VCs can depend on many different cultural norms or other regionalised factors. [8] already looked at three different VC markets, namely the Netherlands, Sweden and Singapore in order to overcome this. We have tried to expand on this, culminating in Table 2. The same problem exists when looking at the results in Figure 2. These relationships have been gathered from many countries spanning from Belgium to South Korea to the USA. It remains to be seen if these relationships can be generalised between industries and geographies. The studies on venture success or firm performance can also suffer from VC selection bias and survivorship bias as shown in Figure 3.

6.2 Relevance for stakeholders

The main objective of this study is to provide valuable insights for startup founders who want to apply for the TOP loan at the UT, and even worldwide entrepreneurs who want to know more about what to look out for when applying for venture capital. The main advice is this: while there is much debate on 'the jockey or the horse', both are needed to participate in the horse race. VCs care a lot about the entrepreneur, and their experiences are shown to be important for success later on. The way that a VC perceives the competency of the entrepreneur is very diverse, and a lack of skill or knowledge in one area can be made up by having skills or knowledge in other areas [49]. The data shows that having a good value proposition i.e., having a product which solves something important for the customer is very significantly correlated with venture survival. For the administrators of the TOP loan, Novel-T, the results are interesting as well. The TOP loan assessment seems to be good at what it was meant to do: gauge investor readiness of a startup. All the five assessment categories are positively correlated with follow-up funding, and three of those are also significant with $p < 0.05$. One important recommendation for Novel-T is to critically examine whether the current weights placed on the selection criteria in the TOP loan assessment are useful for the sector of the startup that is being examined. As mentioned in Section 5.1.3, an example is nanotechnology companies, where patents are significantly more important than the current weights show. Given, for example, the prominence of the MESA+ nanotechnology institute at the UT and the amount of med-tech companies which have already applied for and/or received the TOP loan, it could prove to be worthwhile to examine if a (slightly) different assessment scheme would create a better representation of the investor readiness of startups in those sectors.

Category (mean score)	Number of FTE	Total amount of follow-up funding	Still active?
Execution	0.212*	0.116	-0.021
Growth	0.271**	0.286***	-0.162*
Market opportunity	0.129	0.202**	0.026
Value proposition	0.307**	0.188*	0.280***
Competitive advantage	0.144	0.228**	0.045

Table 7. Pearson correlation coefficients for number of FTE equivalent, total amount of follow-up funding, and still active status. Significance: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6.3 Future research

To build on the results of our study, future research should focus on three key sections. First, investigating whether studies on investment criteria and startup success can reasonably be generalised across cultures and geographies. Second, the feedback loop described in Figure 3 needs to be investigated further. As shown in Figure 2 and discussed in Sections 5.2.2 and 5.2.3, VC funding acts as a mediator variable for certain success outcomes. It also can act as a signal for startups with capable entrepreneurs and good business plans. Future research should analyse whether VC funding is the cause or the signal for follow-up success. The same dataset as used in our research can be used as well, but a more advanced data analysis method should be used to take follow-up funding into account in its role as mediator variable, something which our method is not able to do. Third, there are possibilities in validating the TOP loan assessment scorecard for different purposes (such as measuring success likelihood instead of investor readiness), geographies and industries (outside of IT & Internet). This could provide value for other institutions which want to start their own startup support loan in their specific contexts.

7 CONCLUSION

In the crowded field of startup fundraising, the TOP loan can be a good option for entrepreneurs affiliated with the UT. However, getting accepted for the TOP loan is not a guarantee, and . This paper shows the factors which the TOP loan committee analyses, broader research on VC investment criteria, what factors correlate to follow-up startup success and shows what success TOP loan recipients have later on, based on their performance on the TOP loan assessment scorecard. By exploring existing literature on VC investment criteria this study has found what factors are important to VCs globally, and specifically in the Netherlands. In the Netherlands, a VC looks primarily for a good product or service, but the entrepreneur behind the startup is the second most important factor. A business being able to scale and gain a large market share of a large market is paramount. This study also investigates the traits which successful startups and entrepreneurs have. The main findings are that a higher education level, positive experience in startups, management or the same industry as the startup is in are correlated to multiple measures of firm performance. We also found that entrepreneurs who take more time planning their venture succeed more often. Entrepreneurs who pay attention to details and are able to assess and react to risk well are often more successful, while also being more likely to attract more VC financing. VC financing, especially in the growth stage, can act as a signal but also as a driver for future success. Lastly, a dataset of 77 startups who successfully have attained TOP loan financing is analysed to find correlations between their FTE count, follow-up funding and their survival rate. Companies who have a good value proposition are significantly more likely to survive, and have higher FTE counts. This is also more likely for companies with a good growth plan. Those companies also attract more follow-up funding. A good market opportunity and competitive advantage also lead to more follow-up funding. Entrepreneurs can use this knowledge to their advantage to prepare themselves better for a TOP loan application, while Novel-T can use these findings as proof of the effectiveness of the process. After the application, entrepreneurs can also take their assessment scores and change their plans to better match what VCs are looking for.

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REFERENCES

[1] Dustin Bauer, Sebastian Junge, and Tobias Reif. May the resources be with you: a systematic review and framework of startup funding options. *Management Review Quarterly*, pages 1–32, 3 2023. ISSN 2198-1620. doi: 10.1007/s11301-023-00336-6. URL https://link.springer.com/10.1007/s11301-023-00336-6.

[2] Greg Fisher, Suresh Kotha, and Amrita Lahiri. Changing with the times: An integrated view of identity, legitimacy, and new venture life cycles. *Academy of Management Review*, 41:383–409, 7 2016. ISSN 0363-7425. doi: 10.5465/amr.2013.0496. URL http://journals.aom.org/doi/10.5465/amr.2013.0496.

[3] Marcos González M., Orestis Terzidis, Yunfei Miao, Benedict Heblich, and Katherina Kuschel. What matters for early-stage startups? a qualitative content analysis based on case studies. pages 1–11. IEEE, 6 2023. ISBN 979-8-3503-1517-2. doi: 10.1109/ICE/ITMC58018.2023.10332298. URL https://ieeexplore.ieee.org/document/10332298/.

[4] Paul Gompers and Josh Lerner. What drives venture capital fundraising? 1 1999. doi: 10.3386/w6906.

[5] Novel-T. Novel-t | top loan, 2024. URL https://novelt.com/en/products/18/top-loan/. accessed 30-06-2024.

[6] Golden Egg Check. For startups - golden egg check, 2024. URL https://goldeneggcheck.com/en/startups/. Accessed 30-06-2024.

[7] Albert Jan de Croes. Expert interview with investment specialist of novel-t, 5 2024.

[8] Thomas Mensink. Venture capitalists' product and market related investment criteria. 2010. URL https://essay.utwente.nl/61381/1/BSc_T_Mensink.pdf.

[9] Ian C. Macmillan, Lauriann Zemann, and P.N. Subbanarasimha. Criteria distinguishing successful from unsuccessful ventures in the venture screening process. *Journal of Business Venturing*, 2:123–137, 1987. ISSN 08839026. doi: 10.1016/0883-9026(87)90003-6.

[10] Juan B. Roure and Robert H. Keeley. Predictors of success in new technology based ventures. *Journal of Business Venturing*, 5:201–220, 7 1990. ISSN 08839026. doi: 10.1016/0883-9026(90)90017-N. URL https://linkinghub.elsevier.com/retrieve/pii/088390269090017N.

[11] Arshad M. Khan. Assessing venture capital investments with noncompensatory behavioral decision models. *Journal of Business Venturing*, 2:193–205, 6 1987. ISSN 08839026. doi: 10.1016/0883-9026(87)90008-5.

[12] Tyzoon T. Tyebjee and Albert V. Bruno. Venture capital: Investor and investee perspectives. *Technovation*, 2:185–208, 6 1984. ISSN 01664972. doi: 10.1016/0166-4972(84)90003-8.

[13] Donald A. Duchesneau and William B. Gartner. A profile of new venture success and failure in an emerging industry. *Journal of Business Venturing*, 5:297–312, 9 1990. ISSN 08839026. doi: 10.1016/0883-9026(90)90007-G.

[14] Jongwoo Kim, Hongil Kim, and Youngjung Geum. How to succeed in the market? predicting startup success using a machine learning approach. *Technological Forecasting and Social Change*, 193:122614, 8 2023. ISSN 00401625. doi: 10.1016/j.techfore.2023.122614.

[15] M. P. Feldman. The entrepreneurial event revisited: Firm formation in a regional context. *Industrial and Corporate Change*, 10:861–891, 12 2001. ISSN 14643650. doi: 10.1093/icc/10.4.861. URL https://academic.oup.com/icc/article-lookup/doi/10.1093/icc/10.4.861.

[16] Ian C. Macmillan, Robin Siegel, and P.N.Subba Narasimha. Criteria used by venture capitalists to evaluate new venture proposals. *Journal of Business Venturing*, 1:119–128, 1985. ISSN 08839026. doi: 10.1016/0883-9026(85)90011-4.

[17] Joongdoug Rah, Kyungjin Jung, and Jinjoo Lee. Validation of the venture evaluation model in korea. *Journal of Business Venturing*, 9:509–524, 11 1994. ISSN 08839026. doi: 10.1016/0883-9026(94)90019-1.

[18] Dan Muzyka, Sue Birley, and Benoit Leleux. Trade-offs in the investment decisons of european venture capitalists. *Journal of Business Venturing*, 11:273–287, 7 1996. ISSN 08839026. doi: 10.1016/0883-9026(95)00126-3.

[19] Andrew L. Zacharakis and G.Dale Meyer. The potential of actuarial decision models. *Journal of Business Venturing*, 15:323–346, 7 2000. ISSN 08839026. doi: 10.1016/S0883-9026(98)00016-0.

[20] Dmitry Khanin, J. Robert Baum, Raj V. Mahto, and Charles Heller. Venture capitalists' investment criteria: 40 years of research. *Small Business Institute Research Review*, 35, 2008.

[21] David Portmann and Chipo Mlambo. Private equity and venture capital in south africa: A comparison of project financing decisions. *South African Journal of Economic and Management Sciences*, 16:258–278, 9 2013. ISSN 2222-3436. doi: 10.4102/sajems.v16i3.354.

[22] José Carlos Nunes, Elisabete Gomes Santana Félix, and Cesaltina Pacheco Pires. Which criteria matter most in the evaluation of venture capital investments? *Journal of Small Business and Enterprise Development*, 21:505–527, 8 2014. ISSN 1462-6004. doi: 10.1108/JSBED-10-2013-0165.

[23] Marek Zinecker and David Bolf. Venture capitalists' investment selection criteria in cee countries and russia. *Verslas: Teorija ir Praktika*, 16:94–103, 3 2015. ISSN 1648-0627. doi: 10.3846/btp.2015.441.

[24] Robert Hanák. What do early-stage investors value more in decision-making? horse vs jockey debate: A meta-analytic review. pages 416–422, 2021.

[25] Tobias Kollmann and Andreas Kuckertz. Evaluation uncertainty of venture capitalists' investment criteria. *Journal of Business Research*, 63:741–747, 7 2010. ISSN 01482963. doi: 10.1016/j.jbusres.2009.06.004. URL https://linkinghub.elsevier.com/retrieve/pii/S0148296309001672.

[26] Alexandra Moritz, Walter Diegel, Joern Block, and Christian Fisch. Vc investors' venture screening: the role of the decision maker's education and experience. *Journal of Business Economics*, 92:27–63, 1 2022. ISSN 0044-2372. doi: 10.1007/s11573-021-01042-z.

[27] European Patent Office. Convention on the grant of european patents (european patent convention) (17th edition), 11 2020. URL https://link.epo.org/web/EPC_17th_edition_2020_en.pdf.

[28] Daniel Hoenig and Joachim Henkel. Quality signals? the role of patents, alliances, and team experience in venture capital financing. *Research Policy*, 44:1049–1064, 6 2015. ISSN 00487333. doi: 10.1016/j.respol.2014.11.011.

[29] Federico Munari and Laura Toschi. Do patents affect vc financing? empirical evidence from the nanotechnology sector. *International Entrepreneurship and Management Journal*, 11:623–644, 9 2015. ISSN 1554-7191. doi: 10.1007/s11365-013-0295-y.

[30] Ervin L. Black, F. Greg Burton, David A. Wood, and Aaron F. Zimbelman. Entrepreneurial success: Differing perceptions of entrepreneurs and venture capitalists. *The International Journal of Entrepreneurship and Innovation*, 11:189–198, 8 2010. ISSN 1465-7503. doi: 10.5367/000000010792217272.

[31] Rosemary Fisher, Alex Maritz, and Antonio Lobo. Evaluating entrepreneurs' perception of success. *International Journal of Entrepreneurial Behavior Research*, 20:478–492, 7 2014. ISSN 1355-2554. doi: 10.1108/IJEBR-10-2013-0157.

[32] Jeffrey W. Alstete. Aspects of entrepreneurial success. *Journal of Small Business and Enterprise Development*, 15:584–594, 8 2008. ISSN 1462-6004. doi: 10.1108/14626000810892364.

[33] Eric Ries. *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. Crown, 2011.

[34] Mark A Hart. The lean startup: How today's entrepreneurs use continuous innovation to create radically successful businesses. *Journal of Product Innovation Management*, 29:508–509, 5 2012. ISSN 0737-6782. doi: 10.1111/j.1540-5885.2012.00920_2.x. URL https://onlinelibrary.wiley.com/doi/10.1111/j.1540-5885.2012.00920_2.x. This is a smaller summary of The lean startup by Eric Ries.

[35] O.A. Guseva and A.N. Stepanova. Startups in russia: Ownership and performance. *Journal of the New Economic Association*, 52:67–97, 2021. ISSN 22212264. doi: 10.31737/2221-2264-2021-52-4-3.

[36] Paola Dubini. Which venture capital backed entrepreneurs have the best chances of succeeding? *Journal of Business Venturing*, 4:123–132, 3 1989. ISSN 08839026. doi: 10.1016/0883-9026(89)90026-8.

[37] Hyungrae Jo and Jinjoo Lee. The relationship between an entrepreneur's background and performance in a new venture. *Technovation*, 16:161–211, 4 1996. ISSN 01664972. doi: 10.1016/0166-4972(96)89124-3.

[38] Shyan B. Bhandari and Mollie T. Adams. On definition, measurement, and use of the free cash flow concept in financial reporting and analysis: A review and recommendations. *Journal of Accounting and Finance*, 17:11–19, 2017.

[39] Yan Alperovych and Georges Hübner. Explaining returns on venture capital backed companies: Evidence from belgium. *Research in International Business and Finance*, 25:277–295, 9 2011. ISSN 02755319. doi: 10.1016/j.ribaf.2011.02.003.

[40] Dirk Engel. The performance of venture-backed firms: The effect of venture capital company characteristics. *Industry Innovation*, 11:249–263, 9 2004. ISSN 1366-2716. doi: 10.1080/1366271042000265401.

[41] Massimo G. Colombo and Luca Grilli. A capital partnership: how human and venture capital affect the growth of high-tech start-ups. *Strategic Change*, 18:231–239, 11 2009. ISSN 1086-1718. doi: 10.1002/jsc.850.

[42] Kenneth E. Marino and Alex F. De Noble. Growth and early returns in technology-based manufacturing ventures. *The Journal of High Technology Management Research*, 8:225–242, 9 1997. ISSN 10478310. doi: 10.1016/S1047-8310(97)90004-3.

[43] Michael Schefczyk and Torsten J Gerpott. Qualifications and turnover of managers and venture capital-financed firm performance. *Journal of Business Venturing*, 16:145–163, 3 2001. ISSN 08839026. doi: 10.1016/S0883-9026(99)00047-6.

[44] Michael Schefczyk. Determinants of success of german venture capital investments. *Interfaces*, 31:43–61, 10 2001. ISSN 0092-2102. doi: 10.1287/inte.31.5.43.9656.

[45] Jan-Georg Streletzki and Reinhard Schulte. Start-up teams and venture capital exit performance in germany: venture capital firms are not selecting on the right criteria. *Journal of Small Business Entrepreneurship*, 26:601–622, 11 2013. ISSN 0827-6331. doi: 10.1080/08276331.2014.892310.

[46] Eli Gimmon and Jonathan Levie. Founder's human capital, external investment, and the survival of new high-technology ventures. *Research Policy*, 39:1214–1226, 11 2010. ISSN 00487333. doi: 10.1016/j.respol.2010.05.017.

[47] Nikolaus Franke, Marc Gruber, Dietmar Harhoff, and Joachim Henkel. What you are is what you like—similarity biases in venture capitalists' evaluations of start-up teams. *Journal of Business Venturing*, 21:802–826, 11 2006. ISSN 08839026.

doi: 10.1016/j.jbusvent.2005.07.001.
[48] Dean A. Shepherd, Andrew Zacharakis, and Robert A. Baron. Vcs' decision processes. *Journal of Business Venturing*, 18:381–401, 5 2003. ISSN 08839026. doi: 10.1016/S0883-9026(02)00099-X.
[49] Mojca Svetek. The role of entrepreneurs' perceived competence and cooperativeness in early-stage financing. *Entrepreneurship Theory and Practice*, 47:2047–2076, 11 2023. ISSN 1042-2587. doi: 10.1177/10422587221127000.
[50] ING Bank N.V. Ing quickcheck, 2024. URL https://www.ing.nl/quickcheck/. Accessed 12-05-2024.
[51] ABN AMRO Bank N.V. Zakelijke lening berekenen - abn amro. https://www.abnamro.nl/nl/zakelijk/producten/financieren/zakelijke-lening/berekenen.html?xpm965=true, 2024. Accessed 12-05-2024.
[52] Coöperatieve Rabobank U.A. Bereken je rente en maandbedrag van je financiering - rabobank, 2024. URL https://www.rabobank.nl/bedrijven/zakelijk-financieren/bereken-indicatie. Accessed 12-05-2024.

A APPENDIX A

For this section the business loans at the three Dutch major banks, ING Bank, ABN Amro (through their New10 subsidiary) and the Rabobank were looked at. The online calculator was used on their websites [50–52]. The ranges of possible interest rates vary, where the ING, who asked for the most detail, outright denied any loan for this possible case. This can be seen as an example of the troubles startups have with receiving bank financing.

Table 8. ING Loan Application Input

Question	**Answer**
Goal	Machinery
Loan Amount	€40,000
Company Existence	6 months to 2 years
Legal Structure	Dutch Besloten Vennootschap
Sector Experience	None
Revenue	0
Revenue Change	No growth nor decline
Profits This Year	Unknown
Entrepreneur's Capital	€5,000
Financing from Other Sources	None
Shareholders' Value	0
Assets	0
Business Plan Signed Off	No
Book Years Signed Off	No
Payoff Time	Unavailable
Interest Rate Range	Unavailable

Table 9. ABN Loan Application Input

Question	**Answer**
Goal	Growth and Expansion
Payoff Time	4 years (48 months)
Interest Rate Range	10.14% - 11.18%

Table 10. Rabo Loan Application Input

Question	**Answer**
Goal	Other
Payoff Time	4 years
Interest Rate Range	6.8% - 8.55%

B AI USAGE STATEMENT

During the preperation of this work, the author used ChatGPT in order to format visual elements and inspiration for specific phrasing. After using this tool/service, the author reviewed and edited the content as needed and takes full responsibility for the content of the work.