THE MYTH OF THE PRODUCT VISIONARY: HOW SUCCESSFUL ENTREPRENEURS REASON IN THEIR BUSINESS PLAN

Jorrit Velzeboer*, Slinger Jansen, Garm Lucassen
Department of Information and Computing Sciences, Utrecht University
Princetonplein 5, 3508 TB Utrecht, The Netherlands

Abstract

[Motivation] As the business plan is the first communication artifact shared between investor and entrepreneur, it sets the anchoring point in investment decision-making. However, due to information asymmetry and uncertainty, the contents in a business plan are not indicative of future startup performance. **[Approach]** Therefore, we investigate other aspects of the business plan that may predict startup performance. Using a constructed coding protocol, we operationalize 23 indicator variables in a sample of 59 (N) pre-filtered business plans from which we infer the Model of Entrepreneurial Logic (MEL). **[Results]** The MEL indicates that investors should screen for (1) means-based action over goal-based analysis, (2) opportunity exploitation over idea validation and (3) grounded market exploration over product development. The idea that successful entrepreneurs are product visionaries is a myth – and diverges from how successful entrepreneurs think, or should think.

Keywords: Decision-making, Prediction, Business Planning, Effectuation, Venture Capital

1. Introduction

For equity investors, it is extremely challenging to predict the future performance of startups as it involves a decision-making process characterized by numerous cognitive biases (e.g. Slovic, 1972; Zacharakis & Shepherd, 2001), uncertainty (Knight, 1921; Shackle, 1979) and information asymmetry (Kirsch, Goldfarb, & Gera, 2009). For every investment decision in a venture capital firm, hundreds of proposals are reviewed. Time constraints force the venture capital firm to make decisions with limited information and time and to refuse most direct meetings (Ocasio, 1997), relying only on cues in the business plan that suggest that it is of high quality (Spence, 1974; Rosch, 1975).

Ideally, investors and entrepreneurs share an understanding of the cues that suggest that the venture is of high quality. In most cases it is the entrepreneur who tries to conform to the expectations of the investor by including elaborate financial predictions and market forecasts, which the investor can easily compare to other plans and publicly available figures. Honig (2004) suggests that the business plan has a limited relationship to the actual quality of the venture and is therefore more rooted in

* Corresponding author. Tel.: +31 627389303. Email address: j.p.i.velzeboer@students.uu.nl

"ceremony than in efficiency". In effect, the entrepreneur uses the plan to legitimize the venture in the eyes of the investor. Hence, the skill that distinguishes successful investors from unsuccessful investors is their ability to read beyond ceremonial cues (Kirsch, Goldfarb, & Gera, 2009). Endeavor (2015) reports that the performance of investment funds is strongly correlated to the entrepreneurial experience of its partners – suggesting that they have better heuristics for identifying cues for high quality than non-entrepreneurial investors. In fact, numerous studies (Read & Sarasvathy, 2005; Sarasvathy, Dew, Read, & Wiltbank, 2007; Wiltbank, Sudek, & Read, 2009) argue for a problematic cognitive gap between entrepreneurs and non-entrepreneurial investors.

There is a need for a universal set of investment criteria based on how entrepreneurial investors make decisions (e.g. Wiltbank, Sudek, & Read, 2009) that is not subject to information asymmetry due to the entrepreneur trying to conform to the expectations of the investor (Trester, 1998; Honig, 2004). Such a set of criteria may be found in the work of Sarasvathy (2001) who initiated the paradigm of *entrepreneurial logic*, which is defined by Read et al. (2005) as "a set of teachable cognitive models and processes that underlie entrepreneurial behavior". The goal of this paper is therefore to defend the thesis that indicators for entrepreneurial logic in the business plan are effective predictors for startup performance. Given this position, this paper aims to contribute in three ways:

1. Section 3 develops a research method that can be used for quantitative exploration of business plans or similarly structured documents. The method includes the development of a coding protocol and the extraction of principal components from a body of text.
2. Section 4.1 - 4.4 propose three constructs of how entrepreneurs should reason in business plans. These constructs are grounded in 23 indicator variables found in the business plan.
3. Sections 4.5 & 5 define and further explore these constructs in the predictive Model of Entrepreneurial logic (MEL). The MEL delineates entrepreneurial logic as is found in the business plan and is contrasted against literature insights.

The remainder of this paper is structured as follows. In section 2 we give an overview of the relevant literature in order to understand investment decision-making and how it relates to entrepreneurial logic. Specifically, we discuss how investors screen the business plans of entrepreneurs and how entrepreneurs handle uncertainty. In section 6 we discuss the theoretical contributions and present our conclusions; thereby recommending investors not to invest in visionary products unless they have commercially proven themselves in the market.

2. Background

There is a big gap in how non-entrepreneurial investors and entrepreneurs think about and make decisions concerning their startups (Sarasvathy, 2009). We first examine how non-entrepreneurial and

entrepreneurial investors make these decisions under information asymmetry, and then compare this to how entrepreneurs handle uncertainty in their decision-making.

2.1 Investment decision-making

The business plan is the first meaningful transaction of information between the entrepreneur and the investor (Kirsch, Goldfarb, & Gera, 2009), wherein the entrepreneur has substantial freedom to control the flow of information. However, entrepreneurs are considered self-delusional in their confidence of the impact they can have on the environment (De Meza & Southey, 1996; Busenitz & Barney, 1997) and most business plans are produced with only the aim of fundraising in mind (Mason & Stark, 2004). For these reasons, the business plan is typically subject to conditions of information asymmetry and biased towards a positive outcome for the entrepreneur (Trester, 1998)

In an attempt to cope with information asymmetry, many venture capital firms tend to specialize in a particular industry and reject opportunities from industries of which they have little understanding (Hall & Hofer, 1993). Additionally, they have a capacity strategy that involves the acquisition and rejection of investment opportunities as effectively and efficiently as possible, leading to an enormous funnel of new venture prospects of which only a marginal fraction will proceed to an investment decision (Fried & Hisrich 1994; De Treville; 2014). The key drawback is that the exceptional opportunities that do reach the end of the funnel are often competed over by other investment firms – making it not a sustainable strategy for less reputable firms.

Another strategy to deal with information asymmetry may be found in the cognitive profile of successful equity investors. Sarasvathy et al. (2009) shows that the cognitive profile of successful investors closely resembles that of entrepreneurs. Similar results were reported by an industry analysis from Endeavor (2015): of every four partners at underperforming venture capital firms, only one has entrepreneurial or executive experience while in top venture capital firms this ratio is inversed. In fact, Wiltbank et al. (2009) proposed that these entrepreneurial investors employ investment criteria distinct from non-entrepreneurial investors and revealed that their investments are associated with significantly fewer failures, yet not fewer successes.

In their judgments of new ventures, entrepreneurial investors emphasize how the entrepreneur makes decisions on their available means, customer acquisition and partnerships over market predictions and extensive financial forecasts (Xia, 2012). The need for investors to include entrepreneurial decision-making in their investment criteria was first implied by Sandberg et al. (1988) who concluded that the interaction between the entrepreneur's characteristics and the environment is far more indicative of performance than any of the other variables in isolation. This conclusion was supported by Stuart et al. (1990), who reported a direct correlation between entrepreneurial expertise and prioritizing activities that lead to superior performance.

According to Sharma (2015), the main problem troubling investors is that they fail to base their judgment on objective criteria – even if they think they do. Zacharakis & Meyer (1998) show that the investment criteria that many investors espouse are not the actual criteria they use. In fact, Kunze (1990) states that "if investors remain consistent in their reasons for rejection, they would never fund any ventures". Instead, most investors tend to resort to the subjective use of heuristics, which are highly subject to individual experience and cognitive biases (Zacharakis et al, 2001). According to Murnieks et al. (2011) one of these cognitive biases makes investors evaluate entrepreneurs more favorably who think in ways compatible with their own. For non-entrepreneurial investors it is therefore especially important to choose the right set of investment criteria early in the investment process.

2.2 Entrepreneurial decision-making

Sarasvathy (2001) suggest that the gap between non-entrepreneurial equity investors and entrepreneurs follows from two distinct rationalities (i.e. logics) for creating value in the environment. Non-entrepreneurial investors and decision-makers in larger organizations believe that they are expected to act as if the environment gives either certainty or risk, but not uncertainty (March, 1978). This expectation to act rationally given a known distribution of outcomes while having a fixed objective in mind defines predictive or *causal rationality*, also referred to as the principle of rational choice (Knight, 1921; Simon, 1955). Causal rationality usually works well in an established firm where the environment is relatively stable and doing more of the same thing is rewarding. Its application is however questionable in early stage startups, where founders must create something new under extreme uncertainty (Eisenmann, Ries, & Dillard, 2012). Sarasvathy and Simon (2000) argued: "where do we find rationality when the environment does not independently influence outcomes or even rules of the game, the future is truly unpredictable, and the decision maker is unsure of his/her own preferences?"

2.2.1 Effectuation

Effectuation is a decision-making theory that solves problems when rational choice and planned strategy fail (Sarasvathy, 2001). The theory posits *effectual rationality* guided by five principles that entrepreneurs are hypothesized to use in the face of uncertainty (Table 1). Given their capabilities, relationships to others and the resources they can afford to lose, entrepreneurs continuously consider novel opportunities in the market. The outcome or the choice of effect is then driven by the entrepreneurs' ability to exploit these opportunities through co-creation and by leveraging their means. Contrary to popular belief, entrepreneurs prefer emergent strategy over forecasting, rational planning and the pursuit of a single grandiose vision. Hence, they disregard predictions of the future as unknowable and eschew analyzing the total available market, technology forecasts, revenue forecasts, and competitive positions over time. Long-term prediction is dependent on having precise knowledge

about the future and is therefore theorized by effectual researchers to fail in environments characterized by uncertainty.

Table 1.

Five principles of effectuation (based on Sarasvathy, 2001; Read & Sarasvathy, 2005).

Principle	Description
View of the future	*Control.* The future is contingent on actions by willful agents: "to the extent that we can control the future, we don't need to predict it."
Decision-making orientation	*Means* provide the basis for decisions and leveraging new opportunities. Goals are contingent on means.
View towards risk	*Affordable Loss.* To control uncertainty, the downside potential should be calculated and can be no more than what the entrepreneur can afford to lose.
View towards others	*Partnerships.* Rather than analyzing the competitive space, entrepreneurs build the market together with their customers and suppliers.
View towards the unknown	*Leverage contingency.* The entrepreneur welcomes surprises by leveraging them into new opportunities.

The theory of effectuation has been critiqued for failing to establish a pragmatic and empirically validated decision-making theory in entrepreneurship (Arend, Sarooghi, & Burkemper, 2016). Many studies on effectuation are of questionable value due to unvaried sampling (i.e., outlier-successful cases) and repeated usage of similar research methods and analytical procedures. These techniques are subject to individual interpretation and therefore needs to be backed with other, preferably more quantitative, research methods. Chandler et al. (2011) was the first to examine effectuation more empirically and found evidence that some aspects are not necessarily unique to effectuation. For example, the co-creation of opportunities was also found in opposing cognitive styles, i.e. causation. Perry et al. (2012) noted that effectuation is not a reflective construct and comprises many loosely connected aspects such as personal resources, personal capabilities, strategic focus, decision-making heuristics, and aspirational flexibility – making it harder for effectuation to sustain as a coherent theory. Arend et al. (2016) therefore recommended effectual researchers to improve on the precision of the effectuation construct and suggest it is more appropiate to move from conceptual analysis towards data collection.

2.2.2 Related theories

Over the past fifteen years, related theories have been developed in parallel to the initial success of effectuation (Sarasvathy, 2001). Although effectuation breaks down entrepreneurial decision-making into more fine grained distinctions, 'entrepreneurial bricolage', 'entrepreneurial creation theory', 'user entrepreneurship' and 'hypothesis-driven entrepreneurship' all contribute to the academic body on entrepreneurial decision-making (Table 2). Like effectuation, entrepreneurial bricolage focuses on the means of the entrepreneur (Baker & Nelson, 2005). It describes the process where entrepreneurs make orthodoxic combinations of their means to solve problems. Both entrepreneurial bricolage and effectuation contain aspects of entrepreneurial creation theory (Alvarez & Barney, 2007). In

entrepreneurial creation theory, opportunities are "not assumed to be objective phenomena formed by exogenous shocks to an industry or market. Rather, they are created, endogenously, by the actions, reactions, and enactment of entrepreneurs exploring ways to produce new products or services". User entrepreneurship suggests that many entrepreneurs build an innovation around a personal need for a product rather than from performing market analysis (Shah, 2007) – emphasizing the disposition for many entrepreneurs to focus on their need for the product rather than the business model.

Hypothesis-driven entrepreneurship (Martin, 2009; Eisenmann, Ries, & Dillard, 2012) has primarily received attention outside of the academic community. On the surface, hypothesis-driven entrepreneurship shares a flexible and human-centered approach with effectuation. The key difference is that it recommends entrepreneurs to define their most important hypotheses and go into the market to test them. This approach assumes that entrepreneurs infer hypotheses from a set of predefined goals: e.g. to become the most popular app for pregnant mothers [goal], entrepreneurs should validate the assumption that mothers need an app [hypothesis] and adapt according to received market feedback [pivot]. In contrast, effectuation (Sarasvathy S. D., Dew, Read, & Wiltbank, 2007) suggests that entrepreneurs act on their limited selection of means to create and commercialize opportunities without a longer-term vision or set of testable hypotheses in mind. Hypothesis-driven entrepreneurship is "reactive and adaptive", whereas effectuation is "enactive and exaptive" (Read & Sarasvathy, 2005).

Table 2.

Comparison of theories related to effectuation (and entrepreneurial logic).

Theory	Problem it solves	Key contribution
Effectuation theory	How do entrepreneurs make decisions under uncertainty?	Sarasvathy, S. D. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency.
Entrepreneurial bricolage	How do entrepreneurs create value under scarcity?	Baker, T., & Nelson, R. E. (2005). Creating something from nothing: Resource construction through entrepreneurial bricolage.
Creation theory	How do opportunities emerge?	Alvarez, S. A., & Barney, J. B. (2007). Discovery and creation: Alternative theories of entrepreneurial action.
User entrepreneurship	Why do entrepreneurs start companies?	Shah, S. K. (2007). The accidental entrepreneur: The emergent and collective process of user entrepreneurship. Strategic Entrepreneurship Journal 1(1-2), 123-140.
Hypothesis-driven entrepreneurship	Which method should entrepreneurs use?	Eisenmann, T. R., Ries, E., & Dillard, S. (2012). Hypothesis-driven entrepreneurship: The lean startup.

2.3 Conclusion

In summary, we found that information asymmetry and entrepreneurial overconfidence inhibit investors from making judgments about the contents in a business plan (Honig, 2004). We discovered how cognitive biases affect investment decision-making (Zacharakis & Shepherd, 2001) and found that entrepreneurial investors are able to deduct conclusions from business plans that are distinct from the

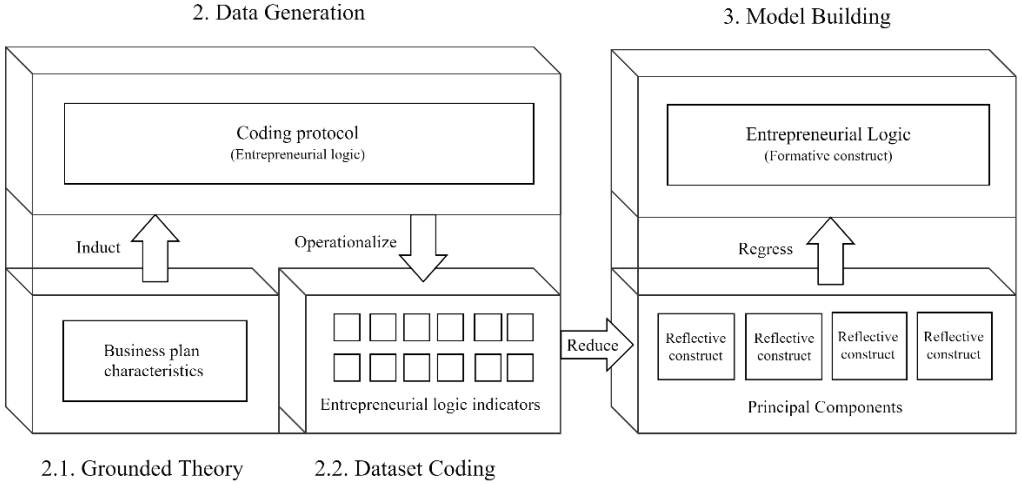
criteria of non-entrepreneurial investors (Wiltbank, Sudek, & Read, 2009). Additionally, we explored the literature on the mindset of entrepreneurs and entrepreneurial investors, i.e. entrepreneurial logic, and found fundamental differences when set against non-entrepreneurial thinkers. In the rest of this paper, we investigate these differences in relationship to the investment screening phase as it frames all subsequent decision-making.

3. Research Method

Given the importance of the business plan in the investment screening phase, we decide to make it our object of study. This artifact is a primary source of information; a historical account containing plans, models, predictions and hypotheses made by the entrepreneur. These characteristics allow for a longitudinal research design – which is crucial for studying the implications of long term investments that typically have exits between four to seven years. The retrospective nature of this study bypasses the problem of entrepreneurs falsely recalling past performance and/or having changed their decision-making processes over time. This problem can occur when comparing successful and unsuccessful entrepreneurs at a single point in time.

This study follows a research protocol that fits the characteristics of the artifact (Fig. 1) and comprises a combination of qualitative and quantitative methods. First, we develop a coding protocol with the software package NVivo according to the method of grounded theory (Glaser & Strauss, 1967; Strauss & Corbin, 1998). Second, we use the coding protocol to operationalize entrepreneurial logic in the business plans as a set of indicator variables. Using the statistical analysis software SPSS, we perform principal component analysis on the operationalized data to quantitatively infer a set of constructs. Following uni- and multivariate analysis, we construct a formative multidimensional predictive model that can be used to evaluate business plans for research or investment purposes.

Figure 1.
Research protocol.



3.1 Data collection

In need of reliable source of business plans, we perform this study in collaboration with a leading venture capital firm focused on highly scalable tech startups. This collaboration allows us to research a sample of 71 business plans received between 2011 and 2013. The startups in the dataset were looking for an investment between EUR 300K and 3M. In consideration of threats to our validity, we scope the dataset to only include internet startups with transaction- or subscription-based revenue models. Transaction- and subscription-based internet startups are currently considered to be the most valuable to prospecting investors because of the scalability of their business models. Removing the plans outside of the research scope yields an N of 59 business plans. We decide to keep business plans of startups that originate from neighboring European countries (n = 8) in our dataset since there is no initial reason to assume significant differences in decision-making. Of the 59 startups, 21 have a business-to-consumer model and 38 have a business-to-business model. Since the venture capital firm does not have a focus on either, we assume that the sample is indicative of the population. For all demographic strata, we perform post-hoc tests to validate whether the MEL holds across the sample.

We use the software tool NVivo to construct a protocol for the systematic operationalization of indicators for entrepreneurial logic within the limitations of the business plan. In adherence to the principles of grounded theory, we use a sub-sample of business plans (n = 10) as input. Conventionally, grounded theory provides a set of techniques and procedures that allow the researcher to induce theories from documents without influence from outside theories (Glaser & Strauss, 1967; Strauss & Corbin, 1998). In our variant, the theories on entrepreneurial logic thematically lead the induction process (Table A3). We make two major distinctions within our set indicator variables: (1) expressed logic, e.g. how the entrepreneur reasons about the future or processes information (Table A3), and (2) theme, i.e. the contextual content that the entrepreneur believes is important to emphasize in the business plan. A field expert (managing partner of a venture capital firm) reflected on the deliverables of the grounded theory cycles and helped us identify possible biases in the constructed coding protocol.

Given the protocol guidelines for the indicator variables (Appendix A), we iteratively code the rest of the business plan dataset (n = 49). Cycling through the business plans ensures consistency and reduces the chances for missing elements, resulting in a complete dataset of operationalized indicator coverage for each plan. Indicator coverage is represented as a fraction (%) proportional to the ‘length’ of the business plan. To give more weight to the absence of particular indicator variables in a plan, we convert them to discrete distributions. The reason for doing this is that the absence of an indicator generally provides more information about the business plan than a minor change in its proportional coverage. As we perform this conversion, we define the step size between the cut-off points by optimizing for smoothness in the shapes of the distributions.

3.1.1 Dependent variables

To distinguish successful from unsuccessful entrepreneurial logic, we construct a measure for startup performance. This measure is composed of the variables odds for 'survival' and the 'growth' rate. We extract the data for these variables from external sources such as LinkedIn, news pages and the Chamber of Commerce. The 'survival' measure is a binary variable (n = 59) containing information about whether the startup managed to stay operational up to the writing of the paper. The 'growth' rate (n = 34) is more challenging to determine due to the lack of data transparency and varying possible measures for venture growth, each of which has its advantages and disadvantages. While profits could be considered as an estimator in traditional brick-and-mortar companies, it is of little use in startups that are predominantly characterized by subscription-based business models that heavily depend on customer life time value and future cashflows. Kraaijenbrink et al. (2011) used employee increase as the measure for performance. The authors argue that small firms are not required to provide financial information and that growing in terms of employees reflects the fact that the founders cannot undertake every task themselves anymore and that they can afford to pay them. In agreement with their approach, we use 'employee increase' as a reflection of venture 'growth'.

There are two problems with our dependent variables. First, there are cases to be made for using the linear employee growth rate as well as for using the compound employee growth factor as measures for venture 'growth'. The compound growth factor is a direct measure for return of investment and, considering the risk involved in smaller startups, corrects for larger startups that have been seeking to expand (e.g. growing from 14 to 22 is not as impressive as growing from 3 to 9). The linear employee growth rate is more appropriate in smaller startups where small bursts in growth easily appear parabolic (e.g. growing from 3 to 9 is not as impressive as growing from 14 to 42). Since both are valid measures for 'growth', we use their geometric mean as the dependent variable as it reflects venture growth in a single continuous ratio while correcting for the weaknesses of both. The geometric mean ($\mathrm{GM} = \sqrt{\mathrm{CG} * \mathrm{LG}}$) is the square root of the multiplication of compound growth (CG) and linear growth (LG) and is generally used when averaging interdependent variables.

The second problem is that failed startups (n = 25) lack a 'growth' rate. We solve this by introducing a performance score (Fig. 2), which is an aggregation of the geometric 'growth' rate and the 'survival' variable. Unlike the continuous 'growth' rate variable, this variable has a discrete distribution and a larger sample size (n = 59 instead of n = 34). The 'performance' score also provides more levels of information (levels = 10) than the binomial variable 'survival' (levels = 2). This means that we can now compare the performance between a startup that failed to survive (level 1), a startup with low growth (level 2-4) and a startup with high growth (level 6-10). Therefore, we generally prefer to use it over the other two variables. Defining the step size follows a process analogous to the discretization of the indicator variables as discussed in section 3.1.1. To ensure its validity, we require

the assumption of proportional odds to hold in the predictive model. This is the assumption that the odds increase proportionally over each cut-off point.

3.1.2 Control variables

As is visualized in Fig. 3, the collected control variables are company 'age' (confounder), artifact-specific data (moderators), i.e. the 'length' and 'format' of the business plan, and received 'investment' (mediator). To proxy for venture maturity, we extract company 'age' from the founders' LinkedIn profile pages. Company 'age' follows a log-linear distribution with a median age of 2 years. We include business plan 'length' and 'format' as control variables to correct for artifact-induced biases that may affect our indicator variables. The variable 'format' embodies two categories: investment memorandums written in A4 document format (n = 18) and PowerPoint pitch decks (n = 41). The 'length' of the plan is represented by the character count. We manually subtract the character count of sections considered irrelevant to the purpose of this study from the total character count. The sections considered irrelevant are the foreword, legal information and appendices. After correction and removing two outliers from the dataset plan 'length' is normally distributed ($p < .05$).

The reason why received 'investment' is essential to this study is that it provides insight into which aspects that correlate to performance are accounted for during investment decision-making. In addition, controlling for this variable corrects for an artificially inflated 'growth' rate. We extract the required information from Dealroom, Crunchbase and archived news pages. Of the 59 (N) startups, 26 (n) received investment. The exact size of the investment could not be defined since that information was in many cases unavailable. This 'investment' variable therefore contains only information about whether the startup managed to raise capital from either informal or formal investors since the year of writing the business plan.

Figure 2.
Distribution of startup 'performance'.

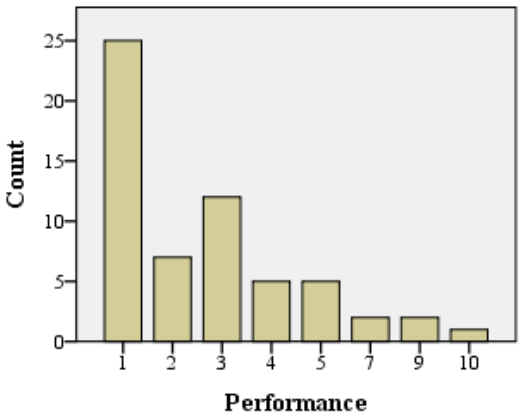
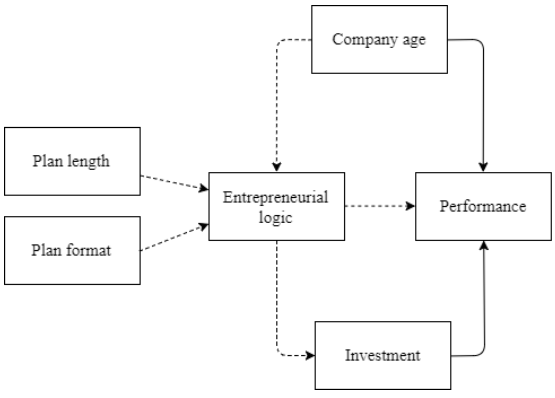


Figure 3.
Variable model. Dashed line: hypothesized relationship.



3.2 Data analysis

Categorical principal component analysis (CATPCA) lets us extract orthogonal components (latent variables) from our data-set of co-varying indicator variables. This allows us to simplify the dataset and subsequently, the MEL. There are several ways to determine whether a component generated by CATPCA should be retained or not. The three techniques that we use in this paper are the evaluation of: (1) its explained variance and its internal reliability, (2) its manifestation in the business plan and its loading factors and (3) its relationship to the other variables and components:

Explained variance and reliability. The most common technique to diagnose principal components is to inspect the amount of variance they explain. According to Girden (2001), we should reject components with an eigenvalue of less than 1.00 because they account for less variability than an average criterion. The Scree test visualizes how the variance is proportionally distributed over the output dimensions. The number of components that should be retained can be determined based on where a break in the graph is observed. Cronbach alpha is conventionally used as a coefficient to determine the lower bound reliability of unidimensional scales developed in questionnaires but can also be applied on CATPCA output. Since this study is exploratory, we accept any component with a value above .5 but acknowledge that the unidimensionality of components scoring lower than .6 needs to be confirmed in confirmatory research.

Loading factors and business plan. Performing loading factor analysis is the best way to interpret principal components. The components are linear variables represented by the intersection of their loading factors. We therefore perform correlation tests on the components and the original indicator variables and compare the results to their defining loading factors. Differences between the correlation test output and the loading factors imply that the component is more latent – requiring a more qualitative interpretation. To illustrate, defining loading factors that fail to show a significant correlation to the component indicate a higher level of internal variability – suggesting that they have different meanings depending on how they are presented within the business plan. We compare these more latent components by examining excerpts from individual business plans scoring either unusually high or low on them.

Univariate analysis. We need to assess which components may explain entrepreneurial performance. Hence, we perform partial correlation tests on the components and the dependent variables, controlled for the effects of moderating variables. Components that show significant ($p < .05$) correlations to any or multiple dependent variables indicate that they constitute entrepreneurial performance and should be retained if they pass the other diagnostic tests. Given the remaining components, we test for their collinearity and interaction effects with the control variables.

3.3 Model building

To model the explanatory power of multiple variables in relationship to each other and performance, we perform ordinal regression on all remaining components, significant indicator variables and control variables. We include received 'investment' as a control variable because our research question requires the identification of factors that are currently undervalued in investment decision-making. Another reason to control for this factor is that the investment is likely to have artificially inflated the 'growth' rate and should therefore be discounted.

Starting with a model that contains all variables, we drop one variable at a time until a set of significant explanatory variables remain ($p < .05$). For the remaining model, we apply the SPSS negative log-log link function rather than the default logit link function because the distribution of the 'performance' score is skewed to the left (Fig. 2). This means that the odds for lower values is larger than the odds for higher values. According to SPSS Advanced Statistical Procedures Companion (Norušis, 2011), the negative log-log link function normalizes these odds.

As we identified all predictor variables, we test the output model for interaction effects, pseudo R-square and goodness-of-fit. We perform the test of parallel lines on the model to ensure that the assumption of proportional odds is held. To aid the generalizability of the model, we apply the model on the following sub-samples: the business to consumer (n = 21) and business to business (n = 38) market and startups from Dutch (n = 51) and non-Dutch (n = 8) origin.

4. Results

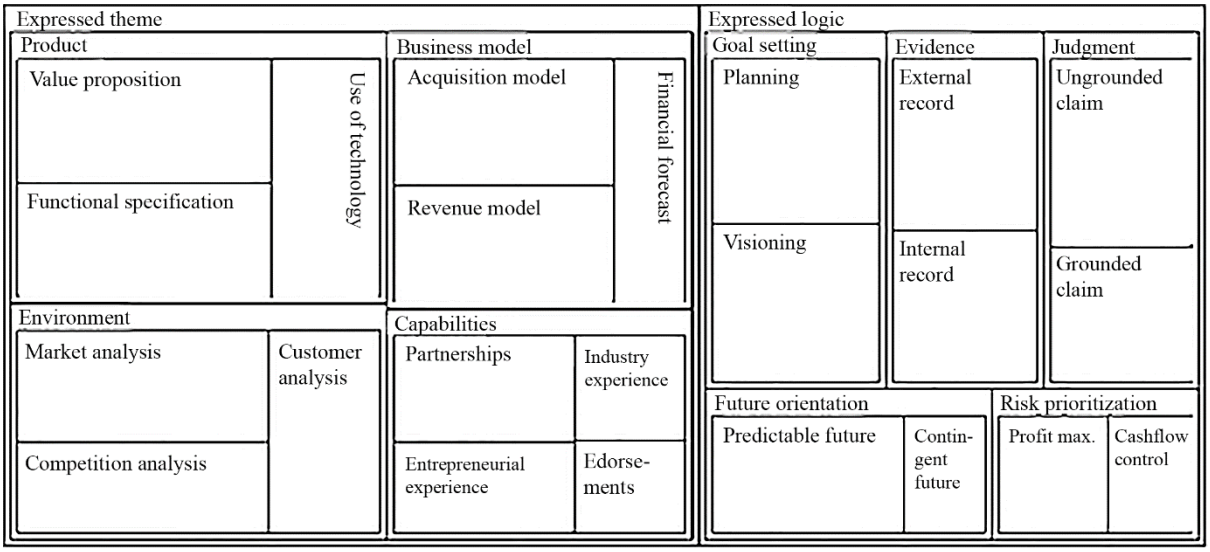
First, we address the key considerations and deliverables that concern the preparation of data. This involves the selection of variables and operationalizing entrepreneurial logic in the business plan to generate a set of indicator variables. Following the data preparation, we discuss the results of the (univariate) analysis performed on the indicator variables and the extracted CATPCA constructs. As a final point, we present the MEL that we developed using ordinal regression.

4.1 Data preparation

Operationalizing the coding protocol on the business plan dataset yield 3250 references reflecting the coverage of 23 indicator variables for each business plan. Using the hierarchical charting technique in NVivo, we visualize the average indicator coverage composition of the business plan in Fig. 4 – giving a general impression of the proportional coverage of each indicator variable in the business plan. The 13 theme indicator variables represent the proportional emphasis on each of the structural elements that compose a business plan. The 10 logic variables represent the use of language in the business plan and are the product of synthesizing the literature with observations in the business plan (Appendix A). All indicator variables show positively skewed distributions after discretization.

Since we want to know which effects to control for in our model, we perform correlation tests on the hypothesized control variables (section 3.1.2) and the indicator and dependent variables. As we expected, company 'age' shows strong inverse correlations ($p < .01$) to 'survival' (positive) and 'growth' (negative). This demonstrates that early stage startups are generally considered high risk (i.e. low odds for survival), high return (i.e. high growth) opportunities to invest in. We found no link from 'performance' to company 'age' ($p = .21$), suggesting that this measure can be reliably used across our population. The results show that plan 'length' has a significant positive moderating effect ($p < .05$) on the indicator variables 'competition analysis', 'visioning' and 'predictable future'. Plan 'format' does not considerably covary with any other variable (including plan 'length') and is therefore the only control variable we reject from this study.

Figure 4.
Represented as a conceptual hierarchy: the proportional coverage for the indicator variables (left: expressed theme) and logic indicator variables (right: expressed logic) in the business plan. Figure is generated in NVivo.



4.2 Indicator variable analysis

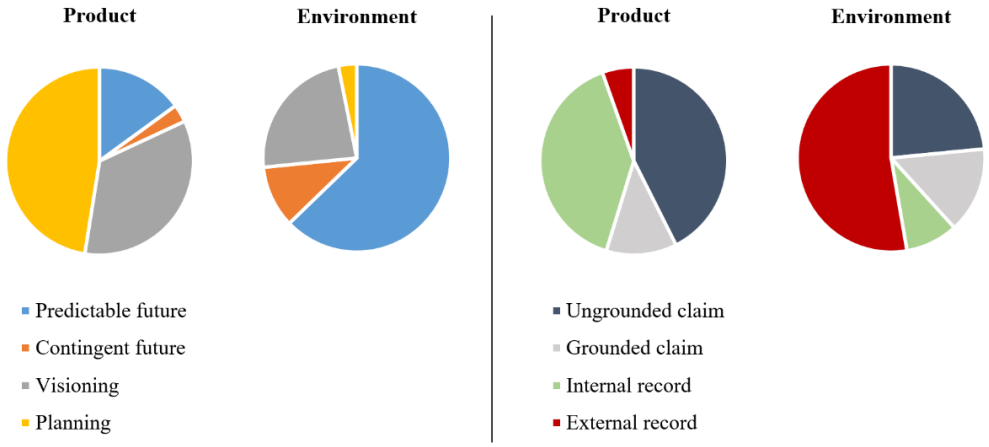
We perform partial correlation tests performed on the indicator variables and dependent variables (Appendix E). Table 3 summarizes the most important findings. A key observation is that 'performance' and 'survival' have comparable results. This is due to asymmetry in the 'performance' distribution (Fig. 2). Since many startups failed ($n = 25$) and therefore not progressed beyond level 1 ($n = 25$), we weight the 'performance' measure to close the gap between level 1 and level 2. We find that performing a grounded 'market analysis' is correlated to 'growth while business plans that emphasize the product are disadvantaged in the long term. As this finding is only significant when we single out surviving startups in our calculations, there is no relationship with performance. Fig. 5 is

developed in accordance with NVivo and visualizes the reasoning differences between product sections and market sections in the business plan. The used concepts correspond to the concepts in Fig. 4.

Table 3.
Key significant indicators measured against 'performance', 'survival' and 'growth'.

		Significance at 0.05 level		
		Performance	**Survival**	**Growth**
Logic indicators	Positive	Cashflow control Grounded claim	Cashflow control Grounded claim	Grounded claim External record
	Negative	Ungrounded claim Visioning Predictable future	Ungrounded claim Visioning Predictable future	
Theme indicators	Positive	Value proposition	Value proposition	Market analysis
	Negative	Financial statement	Financial statement	Use of technology Functional specification

Figure 5.
Left: the proportional use of 'goalsetting' and 'future orientation' for 'product' and 'environment'.
Right: the proportional use of 'judgment' and used 'evidence' for 'product' and 'environment'.



4.3 Component analysis

As described in section 4.2, we reduced the indicator variables to a set of orthonormal principal components, i.e. latent variables, by applying CATPCA on them. The results yield 10 components explaining 86.9% of variance within the dataset (Table 1). Only component 10 has an eigenvalue lower than 1.00 and we observe no sharp decrease (elbow effect) in variance among the component distribution, giving no clear indication to which components should be retained (Fig. 3).

The components that have an unacceptable Cronbach alpha of lower than 0.50 are removed - leaving a set of 5 components that had questionable (requiring more qualitative analysis) to adequate lower bound reliability (alpha between 0.60 and 0.80) explaining 56.9% of the total variability in the dataset. The components display leptokurtic rather than normal distributions, implying the need for nonparametric rather than parametric tests. Leptokurtic distributions are often aggregations of multiple co-varying normal distributions, which is typical in principal components. The absence of normality in the dataset is therefore not a surprising result.

Table 4.
Eigenvalue, variance and reliability tests.

Dimension	Cronbach's Alpha	Total (Eigenvalue)	% of Variance
1	,79	4,02	17,46
2	,66	2,72	11,81
3	,61	2,37	10,33
4	,54	2,07	9,01
5	,50	1,91	8,30
6	,49	1,90	8,25
7	,38	1,57	6,83
8	,28	1,37	5,97
9	,14	1,15	5,01
10	-,13	0,89	3,86
Total	,99[a]	20,00	86,84

Figure 6.
Scree Plot with variance percentage (vertical) and component number (horizontal).

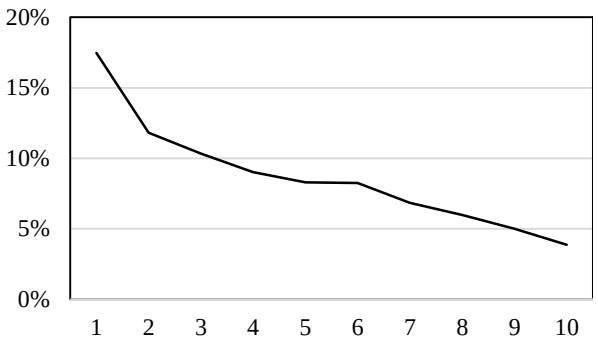


Table 5 shows the relationships between the five remaining components and each of the dependent variables. We must reject components 2 and 4 because both lack a significant relationship with the performance variable and component 2 has a strong undesired dependency on the maturity of the startup (p = .005). Component 1 embodies the potential for upper bound performance (i.e. high growth) whereas component 3 and component 5 represent lower bound performance (i.e. increasing the odds for survival). Correlation tests for collinearity (Appendix D) indicate that component 3 and 5 might be related to each other (p = .002). Despite the similarities, only component 5 appears to be significantly correlated to the received 'investment' (Table 5). We found no evidence for other relationships between the components and the control variables.

Appendix C gives the loading factors for each component and the correlation tests performed on the components and the original indicator variables. Table 6 summarizes the output of this analysis, giving a visual overview of the key loading factors (Fac.) and the significant correlating indicator variables (Sig.). Each component is defined by the intersection of its loading factors. In Table 6, we consider only loading factors with z-scores higher than 0.8 (green) or lower than -0.8 (red) and significance at the 0.05 level. Given the data in table 6, the results of the collinearity tests (Appendix D) and an examination of the values in the business plans, we define the names and dimensional axes of each of the components. We observe only minor discrepancies (*disc*) between the loading output of component 1, component 3 and component 5 and their correlations to the original indicator variables,

suggesting that the latency of the components is low. In fact, component 1 can easily be identified in the business plan as it correlates to a considerable number of indicator variables (k = 14).

Regarding the context variables, we found some support that component 1 is stronger (p = .08) in non-Dutch startups that fundraise in the Netherlands. Note that the n (8) might have been too low to substantially support this conclusion. The only significant difference between 'business-to-business' (n = 21*)* and 'business-to-consumer' (n = *38)* startups is that the former is more likely to emphasize industry 'endorsements' in the business plan (p = .012). Although the use of component 1 appears to be slightly higher for consumer-to-consumer startups (p = .184), there is no meaningful indication for a difference in the logic they use in the business plan.

Table 5.
Partial correlations: components & dependent variables

		Performance	Survival	Growth	Investment
Component 1	Correlation Coefficient	,297*	,220	,477**	,166
	Sig. (2-tailed)	,023	,095	,006	,217
Component 2	Correlation Coefficient	,095	,189	,026	,116
	Sig. (2-tailed)	,473	,151	,888	,391
Component 3	Correlation Coefficient	,337**	,352**	,129	,008
	Sig. (2-tailed)	,009	,006	,483	,955
Component 4	Correlation Coefficient	,172	,244	-,132	-,110
	Sig. (2-tailed)	,194	,063	,472	,415
Component 5	Correlation Coefficient	,336**	.322**	,133	,248*
	Sig. (2-tailed)	,009	,013	,468	,063

Correlation is significant at the 0.01 level (**) or 0.05 level (*) (2-tailed).

Table 6.
Interpretation of the significant components (loading factors & correlations).

Component 1: Synthetic (market pulling and product pushing)			Component 3: Sensemaking (means-based and goal-based)			Component 5: Prioritiziation (exploitation and validation)		
Indicator variable	**Fact.**	**Sig.**	**Indicator variable**	**Fact.**	**Sig.**	**Indicator variable**	**Fact.**	**Sig.**
Market analysis			Industry endorsement			Cashflow control		
Customer analysis			Internal record		*disc*	Profit maximization		
Competition analysis		*disc*	Partnership			Use of technology		
Grounded claim			Cashflow control			Value proposition		*disc*
Contingent future			Industry experience			External record		
Value proposition			Visioning			Internal record		*disc*
Industry experience			Financial statement			Industry endorsement		*disc*
Industry endorsement			Contingent future		*disc*	Predictable future		
Acquisition model			Predictable future					
Internal record			Acquisition model					
External record								
Use of technology								
Functional specification								
Ungrounded claim		*disc*						

4.5 Model building

According to the procedure described in section 3.3, we develop the MEL (Table 7). The MEL consists of 3 significant predictor ($p < .01$) variables: i.e. the 'synthetic', 'sense-making' and the 'prioritization' perspective. In addition, interaction effects ($p < .001$) between 'ungrounded claim' and the 'synthetic' and 'sense-making' perspective support the notion that the MEL is a particularly strong in ungrounded business plans. Given these results, we can also rule out that the 'sense-making' and 'prioritization' perspectives are two sides of the same coin (section 4.2). As we expected, the control variable plan 'length' has a negative confounding effect on predicting future startup performance ($p = .041$) while company 'age' proves to be insignificant within the bounds of the MEL ($p = .590$). Selecting only Dutch business plans in the MEL ($n = 51$) does not alter the significance level of the predictor variables ($p < 0.01$). When we select only the business-to-business startups ($n = 34$), the predictor variables remain significant at the 0.05 level.

Finally, we determine the fit and explanation power of the MEL (Appendix F). To prevent the control variables from influencing the outcome, we remove the control variables from the model. This results in a Nagelkerke R^2 of .438 and a McFadden R^2 of .165. A McFadden R^2 of .165 for a 3 variable model is considered a good fit. A Nagelkerke R^2 of .438 means that 43.8% of the variance in the dependent variable can be explained by the model. The test of parallel lines indicates that the coefficients of the input factors are similar across the slopes of the 'performance' score ($p = .923$), suggesting that the transformation of the growth and survival values to a discrete 'performance' score was considered successful for applying ordinal regression. The goodness-of-fit test (Table F4) shows that the null hypothesis that the fit of the model is 'good' is not rejected ($p = .99$).

Table 7.
Model of Entrepreneurial Logic (MEL)

	Baseline model		Full model	
	Wald	**Sig.**	**Wald**	**Sig.**
Component 1 [A]	13.126	0.000	18.415	0.000
Component 3 [B]	7.028	0.008	12.019	0.001
Component 5 [C]	13.557	0.000	14.703	0.000
Company age			0.359	0.549
Investment			17.673	0.000
Plan length			6.048	0.014

[A] = Market pulling, [B] = Means-based sense-making, [C] = Exploitation | Link: negative log-log

5. Model Interpretation

As we discuss each MEL component in this section, we synthesize our quantitative insights (section 4) with insights from literature on entrepreneurial and investment decision-making and direct observations in the business plan (Appendix G). Since we corrected the MEL for the effects of company

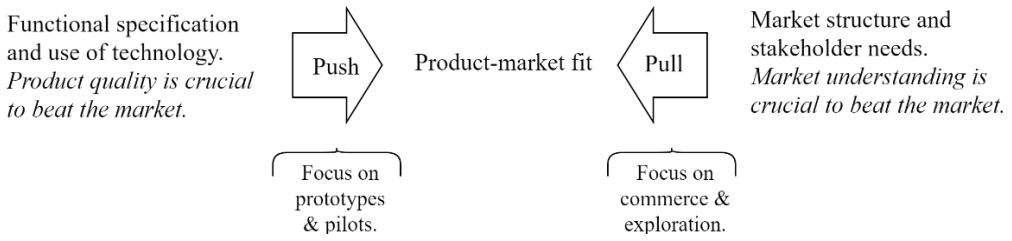
'age', received 'investment' and business plan 'length', the predictive power of each of the proposed constructs should be interpreted independent from these variables.

5.1 Component 1: synthesis perspective

The synthetic perspective refers to the dominant aspect of the venture driving value creation according to the beliefs of the entrepreneur (Fig. 7). The value proposition of most plans leans more on either the benefits of the product and technology ('product pushing') or on deep insights from the market ('market pulling'). Those who synthesize more with the product are theorized to believe that success can be achieved by adding more benefits to the product – which they assume will eventually sell the product. Entrepreneurs with a 'market pulling' mindset are positioned on the other end of the spectrum. They dedicate their efforts to understanding the market with the purpose of determining the viability of their business model from which a product eventually follows. A 'market pulling' mindset entails grounded and continuous exploration of the market and problem-space whereas a 'product pushing' mindset accentuates the solution-space through the development of competitive technology. The MEL suggests that understanding the dynamics and complexity of the market should be preferred over controlling the quality of the product, this is particularly important when the entrepreneur desires to push to the upper ranges of performance and to reduce the amount of uncertainty in the business plan.

Figure 7.

Viewpoints 'product pushing' (left) and 'market pulling' (right).



5.1.1 Reasoning style

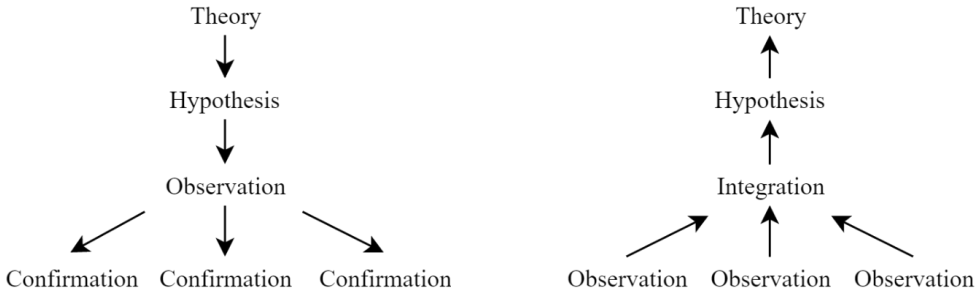
In line with the research on integrative complexity (Driver & Streufert, 1969) and the notion of emergent strategy (Sarasvathy, 2001), we observe that 'market pulling' comprises a type of reasoning where entrepreneurs primarily arrive at their conclusions by integrating (disparate) observations into a business model from which grounded hypotheses incrementally emerge (Fig. 8). As such it involves the cognitive processes of (1) observing, (2) integrating and (3) model building. They start with loose disparate observations and then creatively integrate them into a grounded model of what might work – leading to a minimal amount of hypotheses or assumptions that need to be validated prior to execution.

To support this notion, we find that 'market pulling' has a very strong correlation to the interaction between all theme indicator variables, i.e. product × market × model (p = .003). On the other hand, entrepreneurs with a 'product pushing' mindset see their venture from only one viewpoint –

leading to an elevated level of overconfidence that stunts them in their decision-making (Slovic, 1972; Busenitz & Barney, 1997). Although its incremental process may arguably prevent the development of radical innovations, we posit the opposite: innovation is dependent on the integration of perspectives rather than on the reliance on assumptions. As long as the entrepreneur stays open-minded and keeps exploring the unknown, radical innovation will be emergent.

Figure 8.

Logic in 'product pushing' (left) and 'market pulling' (right).



5.1.2 Theoretical integration

The 'market pulling' construct introduces the notion that entrepreneurs do perform elaborate market research despite its acknowledged complexity and unpredictability (Table 6) – suggesting the latter is no valid reason to neglect its importance in business planning. This contradicts the idea that successful entrepreneurs do not systematically analyze the market and instead prefer to (co-create) opportunities with others (section 3.2.1). We suggest a middle way: entrepreneurs do thoroughly analyze the structure of the market and needs of the customer but they do not attach much value to predictions from external sources.

The lack of a significant relationship between 'market pulling' and 'competition analysis' (Table 6) indicates the contingent nature of positioning the product within its competitive space. This implies a preference to deal with product differentiation after the market-niche has been fully understood and contradicts the research of MacMillan et al. (1987). The authors claimed that product differentiation ("initial insulation from competition") is one of the two key predictors of new venture success. Conceivably, there are different strategies than strategic positioning to achieve product differentiation in the early phases of a startup, e.g. through customer and market interaction.

5.2 Component 3: sense-making perspective

Grounded in how the entrepreneur makes sense of the world, we found two approaches for the entrepreneur to act upon: either through 'means-based' action or through 'goal-based' analysis (Fig. 5). In support of effectuation theory (Sarasvathy S.D., 2001), the MEL shows strong support that successful startups follow a mean-based approach. In their business plan, they emphasize the value of their means

rather than setting strategic goals and prefer leveraging partnerships, controlling their expenses and industry experience and endorsements over goals, predictions and financial forecasts.

We conjecture that startups with business plans scoring high on ‘means-based’ sense making are successful because they know how to leverage these elements into value or, and perhaps even more importantly, into access to more means that they can exploit when new opportunities arise. Startups with business plans scoring high on ‘goal-based’ sense making are theorized to underestimate the number of unknown factors that might subvert their predictions while at the same time overestimate the impact of their capabilities on the environment, as they are assumed to be relatively unaware of what they can and cannot achieve with their limited means.

Figure 5.
Left: means-based sense-making (selection of goals, given means).
Right: goal-based sense-making (selection of means, given a goal).

5.2.1 Theoretical integration

Unlike ‘market pulling’, which is a predictor of all three dependent variables, our results only support ‘means-based’ sense-making as a significant predictor for ‘performance’ and ‘survival’, but not for ‘growth’ (section 4.2). Hence, we posit that effectuation (Sarasvathy S.D., 2001) is not effective for entrepreneurs who want to achieve high growth. Instead, future researchers should approach effectuation as a method to reduce risk, rather than as a method to create scalable startups. For investors, we therefore recommended them to include ‘means-based’ logic in their investment criteria to guarantee a minimum level of lower bound rather than upper bound performance.

Furthermore, we rejected the hypothesis that any of the MEL constructs are dependent on the maturity of the venture (section 4.4). Therefore, we follow the conclusions of Read et al. (2005) and Kraaijenbrink et al (2011) that a ‘means-based’ (effectual) mindset is not unlearned as the venture grows. In fact, the means-based entrepreneur may eventually run into scalability issues unless the entrepreneur also adopts a ‘goal-based’ mindset, which is something that could be taught by a participating equity investor.

5.3 Component 5: prioritization perspective

We found two strategies that entrepreneurs take to build their venture: successful entrepreneurs tend to have an ‘exploitation’ mindset while unsuccessful entrepreneurs tend to have a ‘validation’

mindset. Entrepreneurs with the ‘exploitation’ mindset prioritize the commercialization of a piece of technology, feature or a service that they have access to and proceed building an innovative business model and product around their initial cashflow. Entrepreneurs with the ‘validation’ mindset prioritize the search for alternative sources of evidence to validate a need for their envisioned product. The exploitation of an opportunity is essentially a form of validation, albeit significantly more aggressive and focused on what matters most: to sustain and grow profitable.

The reason why entrepreneurs should prioritize exploitation over validation is that incoming streams of revenue can already be examined to estimate the profitability and scalability of the business model and product, while alternative sources of evidence can deceive entrepreneurs into believing that their venture is of high value – falling for the over-confidence and self-confirmation bias. Arguably, the self-deceived entrepreneur is unwilling to face reality – afraid of losing their idealized view on the world. The usage of hypothesis-driven methods in direct conjunction with entrepreneurship should therefore be reflected on with caution.

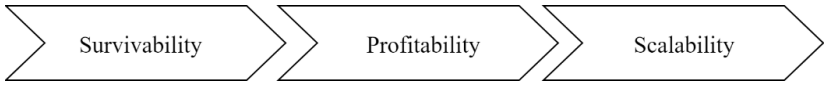
5.3.1 Theoretical integration

Following the study of Davidsson et al. (2009) who emphasize the importance of becoming profitable prior to scaling, we suggest the prioritization sequence as is illustrated in Fig. 6. Successful entrepreneurs first focus all entrepreneurial efforts on acquiring a stable cashflow, market understanding and other leverageable means while controlling for expenses. They can achieve this by (e.g.) visiting network events, building on top of existing ecosystems that allow for easy commercialization, solving problems on project-basis or even doing consulting projects in a domain of expertise.

After successful entrepreneurs secured a cash flow, they examine their means and market understanding to identify grounded and innovative opportunities that are likely to increase the profitability of their venture. These opportunities can then be exploited by hiring professional developers who can build high-quality products. Finally, successful entrepreneurs scale their startup by increasing sales efforts, fundraising, and adapting the product to fit the upper bounds of the market.

Figure 6.

Proposed entrepreneurial prioritization sequence.



6. Discussion

This study contributes to existing literature in many ways. Most of the academic body on investment decision-making is either concerned with biases and obstacles in the investment process or, in earlier studies (1980s-1990s) about which aspects of the venture predict performance. We conjoined

both in this paper by positioning the MEL as a set of business plan investment criteria that is not subject to information failure due to information asymmetry and entrepreneurial overconfidence. Congruent to effectuation theory, we found evidence that investing in a hypothesis-driven and goal-based mindset is correlated to investment failure. Yet, we diverged from effectuation in two fundamental ways. The first is methodical in nature: we studied entrepreneurial logic from the perspective of business planning in relationship to startup performance rather than from the self-assessed wisdom of 'expert' entrepreneurs. The MEL is therefore more indicative of successful entrepreneurial logic than effectuation. Following the suggestions of Perry et al. (2012), we applied quantitative methods on a representative sample of archived entrepeneurial documents rather than relied on the subjective assessment of exceptional cases.

The second path where we diverged from effectuation is the acknowledgment that effectuation is not a complete view on entrepreneurial reasoning. This is exemplified in the entrepreneurs' attitude towards performing market research: effectuation suggests that entrepreneurs dismiss the need to analyze the market due to its inherent complexity. This paper shows that most successful startups do purposefully analyze and integrate the dynamics of the customer and the market, but do not hold fixed convictions of it – thus we hold a more nuanced and contextually grounded understanding of entrepreneurial logic than effectuation. In terms of market disruption, effectuation accentuates only the abstract notion of "co-creation" and completely fails to consider the integrative processes of business modelling and product development. To fill this gap, we have proposed that product development follows from the business model, which can generally only be reliably estimated after initial partnerships and cashflow have been acquired and examined first. Lastly, we have evidence for only a selection of the effectuation constructs and therefore agree with Arend et al. (2016) to simplify the effectuation construct in order to make it more robust and reproducable for subsequent studies.

5.6 Conclusions

In an environment characterized by entrepreneurial overconfidence, information asymmetry and uncertainty, evaluating the reasoning of the entrepreneur in the business plan is demonstrated to be a reliable way to predict future startup performance. Startups with elaborate, visionary business plans that emphasize the product over the market tend to have the lowest performance whereas startups with more concise and opportunistic business plans that manage to integrate their means with market understanding had the highest. In addition, we found that the average investor does not yet recognize 'means-based' and 'market pulling' logic in the business plan as significant predictors for startup performance. Hence, we advise that investors also adopt these constructs of entrepreneurial logic in their decision-making – so that both investors and entrepreneurs can come to more effective transactions. More specifically, we recommend using 'market pulling' logic to predict both lower and upper bound performance and the other two constructs to predict lower bound performance.

From a psycho-philosophical perspective, we conclude that business planning according to the principle of rational choice is a poor choice: entrepreneurs cannot predict the unknown and are theorized to fall for self-confirmation and overconfidence biases when validating the demand for their hypothesized product. Beyond the writing of the plan, we advise entrepreneurs to remain opportunistic and to focus on the product only after an initial cashflow has been established in a market that the entrepreneur understands. Finally, we recommend entrepreneurs not to fall for the appeal of becoming the visionary entrepreneur–innovator but to remain openminded and realistic in what they can achieve.

Further research can be performed in three directions. The first direction is the application of the MEL in practice. This could happen as a design science approach where we develop a method and a software tool that generates automated reports based on the characteristics of manually coded business plans. The second direction is the development of a standardized business planning method for startups according to the insights of this study. The third direction is the application the MEL in systems development, e.g. we see potential in a sales-driven development method where developers commercialize external libraries and existing software ecosystems in markets they understand.

5.7 Limitations

We found some limitations in our results regarding the choice of the dependent variable and the MEL validity. First of all, we conclude that measuring venture performance is not trivial. Since we used employee increase as the estimator for growth, all conclusions are based on the entrepreneurs' ability to grow their workforce rather than their ability to grow their profitability. Since the MEL is supposed to favor cost reduction over employee growth, we theorize that our conclusions could have been even stronger if an alternative way to estimate performance was found. However, we do believe that our choice of dependent variable is more reliable than the more subjective measure of entrepreneurial 'expertise', on which most effectuation studies are based.

A major validity threat in the MEL is that the Cronbach alpha test indicated that the 'prioritization' construct may not be as reliable as the other two. Until the reliability of this construct has been confirmed, it may mean that this component should be interpreted as a formative rather than a reflective construct. In addition, we were unable to generalize the validity of the MEL beyond the Netherlands due to the small sample size (n = 8) of non-Dutch business plans. Finally, we did not make any distinctions between the types of investment because of data inconsistencies. While this may be considered a limitation in the validity of the MEL, the lack of distinction allows us to generalize the model over a wide range of types of investment decision-making, e.g. startup accelerators and informal investors. Note that this generalization does not hold if we assume latent selection biases in the data.

Appendix A

Table A1.

Theme coding protocol to ontologically describe the content of the business plan.

Conceptual cluster	Indicator	Protocol
Product	Value proposition	Expressions related to the external value of the proposed services.
	Use of technology	Expressions elaborating on the internal quality and technical attributes of the product.
	Functional specification	Expressions elaborating on the functionalities of the proposed services.
Environment	Market analysis	Expressions related to market structure, opportunity and size.
	Customer analysis	Expressions related to customer needs and characteristics.
	Competition analysis	Expressions related to competitor definition and performance.
Capabilities	Partnerships	Expressions related to the leveraging of capabilities external to the startup.
	Industry experience	Expressions related to the startup's connection with the market or industry.
	Endorsement	Expressions related to media coverage, endorsements and awards from the industry.
	Entrepreneurial exp	Expressions related to entrepreneurial performances prior to the startup.
Business model	Revenue model	Expressions related to pricing and incoming streams of revenue.
	Financial statement	Expressions related to the financial performance and feasibility of the startup.
	Acquisition model	Expressions related to the acquisition of users or customers.

Table A2.

Logic coding protocol to describe the reasoning style in the business plan.

Conceptual cluster	Indicator	Protocol
Risk propensity	Profit maximization	Expressions related to maximizing customer life time value while minimizing acquisition costs or referring to the scalability and profitability in any other way.
	Cashflow control	Expressions related to managing risk by controlling expenses and establishing an early cashflow (without necessarily having a finished product).
Judgment	Ungrounded claim	Non-trivial claims that are not grounded in sufficient evidence or argumentation.
	Grounded claim	Non-trivial claims that are grounded in sufficient evidence or argumentation.
Goal setting	Visioning	Expressions that forecast the future, trends or long-term objectives.
	Planning	Expressions that detail the startup's pragmatic action-oriented planning.
Future orientation	Predictable future	Expressions of the future that proclaim a fixed and singular outcome.
	Contingent future	Expressions of the future that consider the possibility of alternate outcomes (e.g. scenario analysis, conditional goalsetting).
Evidence	Internal record	All internally produced data, results and evidence.
	External record	All data, results and evidence gathered externally.

Table A3.

Logic coding protocol to describe the reasoning style in the business plan.

Concept	Description
Risk propensity	Many studies on entrepreneurial decision-making include inclination to reduce or accept risk in their research. Risk propensity was identified in the business plan by sentences, images and paragraphs emphasizing the scalability ('profit maximization') and afforded risk ('cashflow control') of the startup. While some startups favored the margins and scalability of their business model, others were more attentive on minimizing risk by controlling their expenses, getting their first customers as soon as possible and staying lean.
Judgment	Kirsch et al. (2009) had also coded business plans but without the use of grounded theory. In their research they attributed scores to claims made by the entrepreneur, reflecting its validity, verifiability and magnitude. We simulated these scores with two simple codes that we directly observed in the business plan. Some plans were objective in their lines of reasoning, presenting only the facts and leaving the conclusions up to the investor ('evidence'). Other plans included more claims and contained a heavier use of adjectives; many of which were backed by evidence ('grounded claim'), e.g. "the system is very user-friendly because… [insert fact]", while others were purely based on pre-conceived speculation ('ungrounded claim'), e.g. "the system is the most user-friendly system on the market."
Goal setting	Two distinct approaches in how entrepreneurs presented their goals were observed. Some goals were visionary and imaginative ('visioning') while others were more pragmatic and action oriented, providing a detailed list of items to be done before release ('planning'). Research on entrepreneurial decision-making partially supported this distinction, often dichotomizing it into 'strategic' versus 'tactical' planning. However, 'strategic' long-term business plans rarely encompassed any planning at all and 'tactical' business plans often lacked the long-term view on the future.
Future orientation	We observed two ways for a startup to conceptualize the future in a business plan. Either by proclaiming certain and fixed statements ('predictive future') or by providing scenarios of what could possibly happen ('contingent future'). A fixed idea of what the future will look like can be explained by either an unwillingness to see alternative scenarios or trying to appear well-educated and focused to potential investors - arguably it is a combination of both.
Evidence	Two types of evidence were observed within the business plan: 'internal records' (e.g. customer references, conversion rate and number of sales) and 'external records' (e.g. from articles or books). This conceptual cluster reflects the entrepreneurial tendency to prefer data they control rather than data they cannot. Effectual researchers have emphasized the preference of entrepreneurs to collect their own data rather than to use external sources.

Appendix B

Table B1.
Theme indicator descriptives. Range is the distance between the minimum and maximum value. Zero represents the percentage of cases where the value equals 0.

Indicator Variable	Median	Range	Zero (%)
Value proposition	2	0-6	3.4
Use of technology	1	0-5	20.3
Functional specification	2	0-9	10.2
Market analysis	2	0-5	11.9
Customer analysis	1	0-3	28.8
Competition analysis	1	0-4	27.1
Partnerships	1	0-3	39.0
Industry experience	0	0-2	62.7
Endorsement	0	0-2	67.8
Entrepreneurial exp.	1	0-2	47.5
Revenue model	1	0-4	20.3
Financial statement	1	0-3	45.8
Acquisition model	1	0-7	13.6

Table B2.
Logic indicator descriptives. Range is the distance between the minimum and maximum value. Zero represents the percentage of cases where the value equals 0.

Indicator Variable	Median	Range	Zero (%)
Profit maximization	0	0-2	54.2
Cashflow control	0	0-2	64.4
Ungrounded claim	1	0-6	15.3
Grounded claim	1	0-2	39.0
Visioning	1	0-5	16.9
Planning	1	0-4	13.6
Predictable future	1	0-6	20.3
Contingent future	0	0-2	66.1
Internal record	1	0-5	30.5
External record	1	0-4	22.0

Table B3.
NVivo queries on the proportional use of goalsetting and future orientation in the business plan per theme cluster.

	Predictable future	Contingent future	Visioning	Planning
Product	2.74%	0.56%	6.29%	8.67%
Capabilities	2.88%	0.48%	2.74%	12.50%
Environment	15.05%	2.55%	5.61%	0.76%
Acquisition model (business model)	13.12%	2.72%	9.05%	32.13%
Revenue model (business model)	14.79%	3.03%	9.86%	12.12%
Financial statement (business model)	65.57%	16.39%	68.85%	9.84%

Table B4.
NVivo queries on the proportional use of judgment style and evidence in the business plan per theme cluster.

	Ungrounded claim	Grounded claim	Internal record	External record
Product	9.87%	2.82%	9.23%	1.26%
Capabilities	1.92%	0.48%	12.50%	0.96%
Environment	16.58%	10.45%	6.38%	37.24%
Business model	3.39%	3.65%	21.35%	1.82%

Appendix C

Table C1.
Loading output breakdown.

	Component 1: Synthetic	Component 3: Sense-making	Component 5: Prioritization
	Market pulling	**Means-based**	**Exploitation**
Positive factors	Market analysis [1.965] Customer analysis [1.931] Competition analysis [1.934] Grounded claim [1.492] Contingent future [.998]	Endorsement [1.574] Internal record [1.538] Partnerships [1.066] Cashflow control [0.806]	Cashflow control [2.022] Profit maximization [1.788] Use of technology [1.550]
	Product pushing	**Goal-based**	**Validation**
Negative factors	Use of technology [-1.530] Functional specification [-.912] Ungrounded claim [-.911]	Visioning [-2.512] Financial statement [-2.426] Contingent future [-1.236] Predictable future [-0.903]	Value proposition [-1.605] External record [-1.456] Internal record [-1.354] Endorsement [-1.298] Predictable future [-0.983]

Table C2.
Component - indicator variable correlations

		Significant Kendall Tau correlations ($p < 0.05$)
Component 1: Synthetic	**Market pulling**	Value proposition, market analysis, customer analysis, industry experience, endorsement, acquisition model, grounded claim, contingent future, internal record, external record.
	Product pushing	Use of technology, functional specification.
Component 3: Sense-making	**Means-based**	Partnerships, industry experience, cashflow control, endorsement.
	Goal-based	Financial statement, acquisition model, visioning, predictable future.
Component 5: Prioritization	**Exploitation**	Use of technology, profit maximization, cashflow control.
	Validation	Predictable future, external record.

Appendix D

Table D1.
Partial correlations: components & dependent variables

			Performance	Survival	Growth	Investment
Spearman's Rho	Component 1	Correlation Coefficient	,297**	,220*	,477***	,166
		Sig. (2-tailed)	,023	,095	,006	,217
(controlled for confounding effects)		N	57	57	30	55
	Component 2	Correlation Coefficient	,095	,189	,026	,116
		Sig. (2-tailed)	,473	,151	,888	,391
		N	57	57	30	55
	Component 3	Correlation Coefficient	,337***	,352***	,129	,008
		Sig. (2-tailed)	,009	,006	,483	,955
		N	57	57	30	55
	Component 4	Correlation Coefficient	,172	,244*	-,132	-,110
		Sig. (2-tailed)	,194	,063	,472	,415
		N	57	57	30	55
	Component 5	Correlation Coefficient	,336***	.322***	,133	,248*
		Sig. (2-tailed)	,009	,013	,468	,063
		N	57	57	30	55

Correlation is significant at the 0.01 level (***), 0.05 level (**) or 0.10 level (*) (2-tailed).

Table D2.
Kendall Tau correlations tests for collinearity: model variables.

			Component 3 Means-based	Component 5 Exploitation	Ungr. claim	Company age	Plan length
Kendall Tau	Component 1 Market pulling	Coefficient	-,050	-,224*	,020	,065	,079
		Sig. (2-tailed)	,578	,012	,846	,511	,377
		N	59	59	59	59	59
	Component 3 Means-based	Coefficient		,279**	-,037	-,082	-,141
		Sig. (2-tailed)		,002	,722	,404	,115
		N		59	59	59	59
	Component 5 Exploitation	Coefficient			-,052	-,022	-,004
		Sig. (2-tailed)			,616	,827	,963
		N			59	59	59
	Ungrounded claim	Coefficient				-,084	,131
		Sig. (2-tailed)				,463	,208
		N				59	59
	Company age	Coefficient					-,020
		Sig. (2-tailed)					,837
		N					59

Correlation is significant at the 0.01 level (**) or 0.05 level (*).

Appendix E

Table E1.
Partial correlations: logic & dependent variables

			Performance	Survival	Growth	Investment
Spearman's Rho	Profit maximization	Correlation Coefficient	,190	,159	,173	,094
		Sig. (2-tailed)	,156	,237	,345	,489
		N	55	55	30	55
(controlled for confounding effects)	Cashflow control	Correlation Coefficient	,383**	,358**	,237	,102
		Sig. (2-tailed)	,003	,006	,192	,449
		N	55	55	30	55
	Ungrounded claim	Correlation Coefficient	-,356**	-,344**	-,252	-,187
		Sig. (2-tailed)	,007	,009	,163	,163
		N	55	55	30	55
	Grounded claim	Correlation Coefficient	,386**	,305*	,398*	,238
		Sig. (2-tailed)	,003	,021	,024	,075
		N	55	55	30	55
	Visioning	Correlation Coefficient	-,377**	-,380**	-,234	-,223
		Sig. (2-tailed)	,004	,004	,198	,096
		N	55	55	30	55
	Planning	Correlation Coefficient	,134	,086	,193	-,007
		Sig. (2-tailed)	,320	,523	,290	,957
		N	55	55	30	55
	Predictable future	Correlation Coefficient	-,415**	-,458**	-,033	-,283*
		Sig. (2-tailed)	,001	,000	,856	,033
		N	55	55	30	55
	Contingent future	Correlation Coefficient	,211	,174	,174	-,078
		Sig. (2-tailed)	,115	,196	,340	,565
		N	55	55	30	55
	Internal record	Correlation Coefficient	,234	,239	,083	,088
		Sig. (2-tailed)	,079	,073	,653	,516
		N	55	55	30	55
	External record	Correlation Coefficient	,101	-,020	,441*	,094
		Sig. (2-tailed)	,454	,885	,012	,486
		N	55	55	30	55

Correlation is significant at the 0.01 level (**), 0.05 level (*) (2-tailed).

Table E2.
Partial correlations: theme & dependent variables

			Performance	Survival	Growth	Investment
Spearman's Rho (controlled for confounding effects)	Value proposition	Correlation Coefficient	,322*	,283*	,246	,358**
		Sig. (2-tailed)	,015	,033	,175	,006
		N	55	55	30	55
	Use of technology	Correlation Coefficient	,023	,160	-,426*	-,010
		Sig. (2-tailed)	,866	,236	,015	,944
		N	55	55	30	55
	Functional specification	Correlation Coefficient	-,193	-,069	-,474**	-,161
		Sig. (2-tailed)	,150	,611	,006	,232
		N	55	55	30	55
	Market analysis	Correlation Coefficient	,214	,048	,557**	,195
		Sig. (2-tailed)	,109	,725	,001	,145
		N	55	55	30	55
	Customer analysis	Correlation Coefficient	,066	-,006	,275	-,098
		Sig. (2-tailed)	,627	,964	,128	,470
		N	55	55	30	55
	Competition analysis	Correlation Coefficient	,157	,163	,116	,185
		Sig. (2-tailed)	,242	,226	,526	,167
		N	55	55	30	55
	Partnerships	Correlation Coefficient	,170	,217	-,007	-,042
		Sig. (2-tailed)	,205	,104	,971	,755
		N	55	55	30	55
	Industry experience	Correlation Coefficient	,204	,185	,132	-,070
		Sig. (2-tailed)	,128	,169	,473	,607
		N	55	55	30	55
	Endorsement	Correlation Coefficient	,081	,139	-,046	,008
		Sig. (2-tailed)	,551	,304	,802	,952
		N	55	55	30	55
	Entrepreneurial experience	Correlation Coefficient	,079	,158	-,140	,046
		Sig. (2-tailed)	,560	,239	,443	,734
		N	55	55	30	55
	Revenue model	Correlation Coefficient	-,012	-,046	-,016	-,053
		Sig. (2-tailed)	,928	,735	,931	,697
		N	55	55	30	55
	Financial statement	Correlation Coefficient	-,331*	-,342**	-,107	-,288*
		Sig. (2-tailed)	,012	,009	,559	,030
		N	55	55	30	55
	Acquisition model	Correlation Coefficient	-,114	-,106	-,033	-,153
		Sig. (2-tailed)	,399	,432	,858	,255
		N	55	55	30	55

Correlation is significant at the 0.01 level (***), 0.05 level (**) or 0.10 level (*) (2-tailed).

Appendix F

Table F1.
Test of parallel lines.

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null hyp.	163,259			
General	155,349	7,910	36	**,980**

The location parameters (slope coefficients) are the same across response categories (excluding control variables and link: negative log-log).

Table F2.
Model fitting information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept	195,591			
Final	163,259	32,332	3	**,000**

Excluding control variables and.

Table F3.
Goodness-of-fit

	Chi-Square	df	Sig.
Pearson	355,041	403	**,959**
Deviance	163,259	403	**1,000**

Excluding control variables and link: negative log-log.

Table F4.
Pseudo R-Square

Cox and Snell	**,422**
Nagelkerke	**,438**
McFadden	**,165**

Excluding control variables and link: negative log-log.

* Corresponding author. Tel.: +31 627389303. Email address: j.p.i.velzeboer@students.uu.nl

Appendix G

Characterizing business plan excerpts for each positively correlating MEL construct.
Brackets, […], represent the coded indicator variable.
Parentheses, (…), represent sensitive information.

Construct	Excerpt
Market pulling (synthesis)	The market is ready for disruption: [‘grounded claim’, ‘market analysis’] 1. No transparency on quality, service level and prices for (…) [‘market analysis’]. 2. 62% of the (…) feel uncomfortable negotiating face-to-face / in person with (…) [‘customer analysis’, ‘internal record’]. 3. The bids placed by (…) vary on average 30% up to 300%. 43% of the (…) usually doubt the given quote by (…) [‘customer analysis’, ‘internal record’]. 4. According to recent research every damage under the €500,- should not be not claimed [‘market analysis’, ‘external record’], as a result premiums go up [‘market analysis’, ‘grounded claim’].
Means-based (sense-making)	Licensing deal with (…). Closely working together with (…). Two of the four major (…) already sponsored us [‘partnerships’, ‘internal record’]. No other service does what we do [‘ungrounded claim’, ‘competition analysis’]. The people love it. The industry loves it [‘grounded claim’, ‘industry endorsement’]: - Nomination Amsterdam Prize - Startup of the Year and Best App - Company Award, best online (…) initiative - Top 100 new European companies - Best B2C / Overall Public Winner [‘industry endorsement’, ‘internal record’].
Exploitation (prioritization)	We currently have 12 customers paying a monthly fee [‘internal record’], covering our expenses [‘cashflow control’]. At the moment however, we are still selling our prototype which means that for every customer, some manual work is required [‘cashflow control’, ‘acquisition model’]. In 2012, we want to develop the product into a full SaaS-solution for small and medium enterprises and establish partnerships for the large and corporate segments. [‘planning’, ‘partnerships’, ‘profit maximization’]

References

A., M. (2007). *Venture Capital and the Finance of Innovation.* John Wiley & Sons.

Ahmed, S. U. (1985). nAch, risk-taking propensity, locus of control and entrepreneurship. *Personality and Individual differences 6 (6)*, 781-782.

Alvarez, S. A., & Barney, J. B. (2007). Discovery and creation: Alternative theories of entrepreneurial action. . *Strategic entrepreneurship journal 1(1-2)*, 11-26.

Amit, R., Glosten, L., & Muller, E. (1990). Does venture capital foster the most promising entrepreneurial firms? *California Management Review, 32(3)*, 102-111.

Appelhoff, D., Mauer, R., Collewaert, V., & Brettel, M. (2016). The conflict potential of the entrepreneur's decision-making style in the entrepreneur-investor relationship. *International Entrepreneurship and Management 12(2)*, 601–623.

Arend, R. J., Sarooghi, H., & Burkemper, A. C. (2016). Effectuation, not being pragmatic or process theorizing, remains ineffectual: responding to the commentaries. *Academy of management Review 41(3)*, 549-556.

Argyris, C., & Schön, D. A. (1978). *Organizational learning: A theory of action perspective.* Reading, MA: Addison-Wesley.

Baker, T., & Nelson, R. E. (2005). Creating something from nothing: Resource construction through entrepreneurial bricolage. *Administrative science quarterly 50(3)*, 329-366.

Bhide, A. V. (2003). *The origin and evolution of new businesses.* Oxford University Press.

Blank, S. G. (2006). *The Four Steps to the Epiphany.* Pescadero: K&S Ranch.

Bosch, J., Olsson, H. H., Björk, J., & Ljungblad, J. (2013). The early stage software startup development model: A framework for operationalizing lean principles in software startups. *Lean Enterprise Software and Systems*, 1-15.

Brinckmann, J. G. (2010). Should entrepreneurs plan or just storm the castle? A meta-analysis on contextual factors impacting the business planning–performance relationship in small firms. *Journal of Business Venturing, 25(1)*, 24-40.

Cambridge Associates. (2013). *US PE/VC Benchmark Commentary.* Massachusetts: Cambridge Associates LLC.

Chandler, G. N., DeTienne, D. R., McKelvie, A., & Mumford, T. V. (2011). Causation and effectuation processes: A validation study. *Journal of business venturing, 26(3)*, 375-390.

Columbus, L. (2014, 4 19). *Software Is Dominating Venture Capital Investments In 2014.* Retrieved from Forbes: http://www.forbes.com/sites/louiscolumbus/2014/04/19/software-is-dominating-venture-capital-investments-in-2014/

Cooper, B., & Vlaskovits, P. (2010). *The Entrepreneur's Guide to Customer Development: A cheat sheet to The Four Steps to the Epiphany.* Brant Cooper Patrick Vlaskovits.

Davidsson, P., Steffens, P., & Fitzsimmons, J. (2009). Growing profitable or growing from profits: Putting the horse in front of the cart? *Journal of business venturing, 24(4)*, 388-406.

De Treville, S. P. (2014). Economies of extremes: Lessons from venture-capital decision making. *Journal of Operations Management 32(6)*, 387-398.

De Vaus, D. A. (2001). *Research Design in Social Research.* London: SAGE Publications.

Delmar, F., & Shane, S. (2003). Does business planning facilitate the development of new ventures? *Strategic management journal 24(12)*, 1165-1185.

Dew, N., Read, S., Sarasvathy, S., & Wiltbank, R. (2008). Outlines of a behavioral theory of the entrepreneurial firm. *Journal of Economic Behavior and Organization 66*, 37–59.

Driver, M. J., & Streufert, S. (1969). Integrative complexity: An approach to individuals and groups as information-processing systems. *Administrative Science Quarterly*, 272-285.

Eisenmann, T. R., Ries, E., & Dillard, S. (2012). Hypothesis-driven entrepreneurship: The lean startup. *Harvard Business School Entrepreneurial Management Case (812-095).*

Endeavor. (2015). *Endeavor Insight Analysis.*

Forrester, R. C. (2014). Behavioral Finance: Factors Influencing Angel Investor Decisions. *Dissertations, Theses and Capstone Projects. 635.* .

Fried, V. H., & Hisrich, R. D. (1994). Toward a model of venture capital investment decision making. *Financial management*, 28-37.

Glaser, B., & Strauss, A. (1967). *The Discovery of Grounded Theory.* AldineTransaction.

Gompers, P. A. (1998). What drives venture capital fundraising? *Brookings Papers on Economic Activity: Macroeconomics*, 149-192.

Gruber, M. (2007). Uncovering the value of planning in new venture creation: A process and contingency perspective. *Journal of Business Venturing 22(6)*, 782-807.

Hall, J., & Hofer, C. W. (1993). Venture capitalists' decision criteria in new venture evaluation. *Journal of Business Venturing 8(1)*, 25-42.

Honig, B. (2004). Entrepreneurship education: Toward a model of contingency-based business planning. *Academy of Management Learning & Education 3(3)*, 258-273.

Honig, B. (2004). Institutional forces and the written business plan. *Journal of Management 30(1)*, 29-48.

Kirsch, D., Goldfarb, B., & Gera, A. (2009). Form or substance: the role of business plans in venture capital decision making. . *Strategic Management Journal, 30(5)*, 487-515.

Kraaijenbrink, J., Ratinho, T., & Groen, A. (2011). Planning effectual growth: a study of effectuations and causation in nascent firms. *Babson College Research Entrepreneurship Conference*, (pp. 8-11). Syracuse.

Krafcik, J. F. (1988). Triumph of the lean production system. *MIT Sloan Management Review 30(1)*, 41.

Liker, J. (2004). *The Toyota Way.* New York: McGraw Hill.

* Corresponding author. Tel.: +31 627389303. Email address: j.p.i.velzeboer@students.uu.nl

MacMillan, I. C. (1986). Criteria used by venture capitalists to evaluate new venture proposals. *Journal of Business venturing 1(1)*, 119-128.

MacMillan, I. C., Zemann, L., & Subbanarasimha, P. N. (1987). Criteria distinguishing successful from unsuccessful ventures in the venture screening process. *Journal of business venturing 2(2)*, 123-137.

March, J. G. (1978). Bounded Rationality, Ambiguity, and the Engineering of Choice. *The Bell Journal of Economics 9 (2)*, 587-608.

Martin, R. L. (2009). *The design of business: why design thinking is the next competitive advantage.* Harvard Business Press.

Mason, C., & Stark, M. (2004). What do investors look for in a business plan? A comparison of the investment criteria of bankers, venture capitalists and business angels. *International Small Business Journal, 22(3)*, 227-248.

Mechner, F. (1989). Present certainty equivalents and weighted scenario valuations. *Journal of Business Venturing 4(2)*, 85-92.

Morris, R. (2015, December 2). *Entrepreneurial Experience Separates Top VCs From Other Investors.* Retrieved from TechCrunch: https://techcrunch.com/2015/12/02/entrepreneurial-experience-separates-top-vcs-from-other-investors/

Mulcahy, D. (2014, August 5). *Venture capitalists get paid well to lose money.* Retrieved from Harvard Business Review: https://hbr.org/2014/08/venture-capitalists-get-paid-well-to-lose-money

Müller, R. M., & Thoring, K. (2012). Design thinking vs. lean startup: A comparison of two user-driven innovation strategies. *Leading Through Design*, 151.

Murnieks, C. Y., Haynie, J. M., Wiltbank, R. E., & Harting, T. (2011). 'I Like How You Think': similarity as an interaction bias in the investor–entrepreneur dyad. *Journal of Management Studies 48(7)*, 1533-1561.

Nienhuis, M. D., Kraaijenbrink, J., & Ratinho, T. (2010). Effectuation and Causation: The Effect of Entrepreneurial Logic on Incubated Start-up Performance. Nijmegen, Netherlands.

Nilsen, G. T. (2015). *Lean Startup: A success factor? A quantitative study of how use of the Lean Startup framework affects the success of Norwegian high-tech startups.*

Norušis, M. J. (2011). Ordinal Regression. In M. Norusis, *IBM SPSS Statistics 19 Advanced Statistical Procedures Companion* (p. 84). Addison Wesley.

Ocasio, W. (1997). Towards an attention-based view of the firm. *Strategic management journal*, 187-206.

Osterwalder, A. &. (2010). *Business model generation: a handbook for visionaries, game changers, and challengers.* John Wiley & Sons.

Perry, J. T., Chandler, G. N., & Markova, G. (2012). Entrepreneurial Effectuation: A Review and Suggestions for Future Research. *Entrepreneurship Theory and Practice 36 (4)*, 837–861.

Read, S., & Sarasvathy, S. (2005). Knowing what to do and doing what you know: Effectuation as a form of entrepreneurial expertise. . *Journal of Private Equity 9*, 45–62.

Read, S., Dew, N., Sarasvathy, S., Song, M., & Wiltbank, R. (2009). Marketing under uncertainty: The logic of an effectual approach. . *Journal of Marketing 73*, 1–18.

Read, S., Song, M., & Smit, W. (2009). A meta-analytic review of effectuation and venture performance. . *Journal of Business Venturing 24(6)*, 573-587.

Rosch, E. (1975). Cognitive representation of semantic categories. *Journal of experimental psychology 104(3)*, 192-233.

Rosenbusch, N., Brinckmann, J., & Müller, V. (2013). Does acquiring venture capital pay off for the funded firms? A meta-analysis on the relationship between venture capital investment and funded firm financial performance. . *Journal of Business Venturing 28(3)*, 335-353.

Sandberg, W. R. (1988). Improving new venture performance: The role of strategy, industry structure, and the entrepreneur. *Journal of Business venturing 2(1)*, 5-28.

Sarasvathy, S. D. (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of management Review, 26(2)*, 243-263.

Sarasvathy, S. D. (2004). The questions we ask and the questions we care about: reformulating some problems in entrepreneurship research. *Journal of Business Venturing, 19(5)*, 707-717.

Sarasvathy, S. D. (2009). *Effectuation: Elements of Entrepreneurial Expertise.* Cheltenham: Edward Elgar Publishing. Retrieved from http://slideplayer.com/slide/6389717/.

Sarasvathy, S. D., & Dew, N. (2005). New market creation through transformation. *Journal of Evolutionary Economics 15*, 533–565.

Sarasvathy, S. D., Dew, N., Read, S., & Wiltbank, R. (2007). Effectual entrepreneurial expertise: Existence and bounds. . *Academy of Management Journal*, 1-46.

Sarasvathy, S., & Dew, N. (2005). Entrepreneurial logics for a technology of foolishness. . *Scandinavian Journal of Management 21*, 385–406.

Schenkhuizen, J., Langerak, R. v., Jansen, S., & Popp, K. M. (2014). Defining the Process of Acquiring Product Software Firms. *International Conference of Software Business* (pp. 100-114). Springer International Publishing.

Shackle, G. L. (1979). *Imagination and the Nature of Choice.* Columbia University Press.

Shah, S. K. (2007). The accidental entrepreneur: The emergent and collective process of user entrepreneurship. *Strategic Entrepreneurship Journal 1(1-2)*, 123-140.

Sharma, A. K. (2015). Venture Capitalists' Investment decision criteria for new ventures: A Review. *Procedia-Social and Behavioral Sciences, 189*, 465-470.

Simon, H. A. (1955). A behavioral model of rational choice. . *The quarterly journal of economics*, 99-118.

Slovic, P. (1972). Psychological study of human judgment: Implications for investment decision making. . *The Journal of Finance, 27(4)*, 779-799.

Spence, A. (1974). *Market Signaling: Informational Transfer in Hiring and Related Screening Porcesses.* Harvard University Press.

Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory.* Sage Publications, Inc.

Trester, J. J. (1998). Venture capital contracting under asymmetric information. *Journal of Banking & Finance, 22(6)*, 675-699.

Vorontsova, O. (2016). The analysis of the impact of Causation and Effectuation approaches on decision-making of IT startups.

Wiltbank, R. E., & Sarasvathy, S. D. (2010). What effectuation is not: Further development of an alternative to rational choice. *Academy of Management Conference.* Virginia.

Wiltbank, R., Dew, N., Read, S., & Sarasvathy, S. D. (2006). What to do next? The case for non-predictive strategy. . *Strategic management journal, 27(10)*, 981-998.

Wiltbank, R., Sudek, R., & Read, S. (2009). The role of prediction in new venture investing. *Frontiers of Entrepreneurship Research, 29(2)*, 3.

Womack, J. P., & Jones, D. T. (1996). *Lean thinking: banish waste and create wealth in your corporatio.* Simon and Schuster.

Womack, J. P., Jones, D. T., & Roos, D. (1990). *Machine that changed the world.* Simon and Schuster.

Xia, Z. (2012). The use of effectuation in venture capitalist early-stage investment decision making in China. Adelaide, Australia.

Zacharakis, A. L., & Meyer, G. D. (1998). A lack of insight: do venture capitalists really understand their own decision process? *Journal of Business Venturing*, 57–76.

Zacharakis, A., & Shepherd, D. A. (2001). The nature of information and overconfidence on venture capitalists' decision making. *Journal of Business Venturing 16(4)*, 311-332.