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**VALUATION METHODS FOR SEED STAGE AND
PRE-REVENUE STARTUP COMPANIES: EVIDENCE
FROM BRAZIL**

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PRE-REVENUE STARTUP COMPANIES:
EVIDENCE FROM BRAZIL**

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**"VALUATION METHODS FOR SEED STAGE AND PRE-REVENUE STARTUP COMPANIES:
EVIDENCE FROM BRAZIL".**

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Abstract

Title: Valuation methods for seed stage and pre-revenue startup companies: evidence from Brazil

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The purpose of this work is to analyse and to evaluate different startup valuation methods in the context of Brazilian technological seed-stage startups. This thesis analyses a scorecard, a risk factor summation and a discounted cashflow approach as representatives of different valuation methods. An analysis of the Brazilian entrepreneurial pillars and the semi-structured interviews with experts from the field was conducted to gather information for the modification of the different valuation approaches. Finally, these modified valuation approaches were tested when evaluating the Brazilian technological startup Whatsapp Automação. The research has shown that the pillars of entrepreneurship and the expert interviews indicate a relevance of the characteristics for the valuation of startups in Brazil. The analysis of the pillars of entrepreneurship revealed an insufficient inclusion of the complex regulatory framework in Brazil, the poor level of skilled labour in the country and the restricted access to finance for young entrepreneurs. The analysis of the expert interviews showed that factors like the motivation and passion of the entrepreneurs, the scalability of the business model and economic risks were insufficiently included in existing models. Applying these different modified valuation methods, the scorecard and the risk factor summation method demonstrated the best fit for the valuation process of a seed-stage startup. It has been shown, that personal characteristics of the founders are highly important for investors and need stronger inclusion. Also, entrepreneurs can benefit by knowing the investors main pain points in order to improve the structure of their startup before the first valuation.

Keywords: startup; technology; seed stage; valuation; startup investment; early stage; scorecard; discounted cash-flow; risk factor summation, entrepreneurship

Resumo

Título: Métodos de avaliação de empresas startup de estágio de sementes e pré-receita: evidências do Brasil

Autor: Christian Felix Wildt

O objetivo deste trabalho é analisar e avaliar diferentes métodos no contexto de avaliação de empresas de startups brasileiras de estágio de sementes de tecnologia. Esta tese analisa um scorecard, um somatório de fator de risco e uma abordagem de fluxo de caixa descontado. Uma análise dos pilares empresariais brasileiros e entrevistas semiestruturadas com especialistas da área foi realizado para coletar informações para a modificação das diferentes métodos de avaliação.. Por fim, essas mudanças foram testadas e avaliadas pela empresa brasileira, Whatsapp Automação. A pesquisa mostrou a relevância dos pilares do empreendedorismo e entrevistas no Brasil. A análise dos pilares do empreendedorismo no Brasil, o baixo nível de mão de obra qualificada no país e o acesso restrito ao financiamento para jovens empreendedores. A análise das entrevistas com especialistas mostrou que fatores como a motivação e a paixão dos empreendedores, a escalabilidade do modelo de negócios e os riscos econômicos foram insuficientemente incluídos nos modelos existentes. Aplicando esses diferentes métodos de avaliação modificados, o scorecard e o método de soma de fatores de risco demonstraram o melhor ajuste para o processo de avaliação de uma partida em estágio de preparação. Foi demonstrado que as características pessoais dos fundadores são altamente importantes para os investidores. Assim, os empreendedores podem se beneficiar conhecendo os principais pontos problemáticos para melhorar a estrutura de sua startup antes da primeira avaliação.

Palavras-Chave: startup; tecnologia; estágio de semente; avaliação; investimento inicial; estágio inicial; scorecard; fluxo de caixa descontado; soma do fator de risco, empreendedorismo

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List of Abbreviations

API	Application Programming Interface
BA	Business Angel
DCF	Discounted Cash Flow
eWOM	electronic Word-of-mouth
IPO	Initial Public Offering
IP	Intellectual Property
MAS	Management Accounting System
MCS	Management Control System
VC	Venture Capital(ist)

1. Introduction

More than 10.000 startups are registered in Brazil in 2019 and this number has more than quadrupled since 2012, when only 2.517 startups were registered at the Brazilian startup association (Europartner, 2018; Startupbase, 2019). In 2018, the company “99” became the first Brazilian startup officially named an unicorn, which is a startup valued at over US\$ one billion, when the Chinese company Didi took over control (Schipani & Bradshaw, 2018). Entrepreneurship and capital infusions by venture capitalists (VCs) are on the rise in Brazil. 2017 VCs investments exceeded \$1 billion in Latin America for the first time and the biggest share of this investment goes to Brazil (Leahy, 2018).

Entrepreneurship and startups tend to have an important impact on the economy they operate in. First, there is evidence that young companies account for an unproportionally large share of new jobs created and therefore stimulate employment. Second, most innovations come from startups. As established companies have much of their original product to lose from disruptive technologies it is more likely that startups take the risk and experiment with innovative ideas. And third startups foster economic growth. Examples from the US have shown that most of the economic growth in the 1990s was created by startup companies (Damodaran, 2009).

But to become successful, a startup will need capital. Investors on the other side need to invest their money, where it generates substantial return (Hill & Power, 2001). A successful startup will most probably get to the point where it will need external financing from professional investors in order to grow (Hisrich & Jankowicz, 1990). This is where the valuation of the startup builds a bridge between the investors and the entrepreneur. It indicates the entrepreneur the minimum compensation he should demand. Concurrently the investor conducts a valuation to ascertain the maximum price he should pay for the equity shares he receives (Hering, Olbrich, & Steinrucke, 2006). The final valuation both parties agree on stands after a period of investigation, calculation, evaluation and negotiation.

Determining the value of a seed stage startup is challenging, but necessary when the entrepreneur sells part of the company. As seed stage startups usually lack the metrics needed for the use of traditional valuation methods, like cash flows, earnings or even revenue at times, more experimental valuation methods become applicable for investors and entrepreneurs (Beaton, 2010). At the same time academics argue that these procedures used by VCs, business angles (BA) and entrepreneurs are too subjective for accomplishing a profound valuation (Dittmann, Maug, & Kemper, 2004).

The existence of a reliable valuation method is important for the evolvement of startups and VC. Fundamental differences regarding the valuation of a startup between the entrepreneur and the investor is reported to be one of the main reasons for not reaching accordance about an investment in some industries (Baeyens, Vanacker, & Manigart, 2006). But, without a proper valuation, startups cannot secure the investment needed to grow and cannot contribute to the success of an economy.

Previous research has shown that there is a lack of empirical work on the determinants of valuations in the private equity industry (Cumming & Dai, 2011) and a general scarcity in research about experts' valuations of privately held companies (Elnathan, Gaviols, & Hauser, 2010). Also, the literature about BA and their investment practices is limited in its scope and detail (Paul, Whittam, & Wyper, 2007).

This work will focus on the valuation process of startups in an early life cycle stage, when they still have not passed an investment round, have little or no revenues, negative earnings and products that are still under development. First, it provides an extensive analysis of the determinants of entrepreneurial activity in Brazil. This analysis, combined with an analysis of expert interviews on the topic, helps to indicate implications on the valuation process and focus of seed stage startups in Brazil. Second, this work assessed the application of different valuation models for seed stage startups. Again, the experts' views on the valuation process and on the integration of the relevant country-specific features led to a modification of those models. Then three modified models, the scorecard valuation method, the risk factor summation method and a discounted cash flow (DCF) analysis, are tested on the case of a Brazilian startup, Whatsapp Automação.

2. Research Question and Objectives

The valuation of startups, especially those in an early stage of their life cycle differs fundamentally from the valuation of established companies. For those seed stage startups, some valuation models have been developed and their structural validity has been questioned many times. This thesis has the aim to conduct research about the different valuation models, which leads to my research question:

RQ: Can existing startup-valuation models for seed stage startups be adapted to the entrepreneurial environment in Brazil and which differences and advantages show the models?

The thesis has the central objective to identify decisive factors and suitable valuation methods for a seed stage tech startup in Brazil. Four supporting hypotheses help to answer the research question.

First, an extensive review of the literature on startup valuation approaches will be presented, to outline the existent models and conducted research on those models and its characteristics. Then the entrepreneurial ecosystem in Brazil and its pillars will be described and an applied analysis of the case of Brazil will be undertaken. While doing so, the identification and description of Brazilian particularities that influence the valuation and are relevant for startups is a priority. This will provide a solid foundation for the qualitative interviews and possible modifications of the three valuation models. Another objective is to use the qualitative semi-structured interviews with professionals from the field, to identify particularities of the seed stage startup valuation process in Brazil and to provide information for a deeper analysis of the entrepreneurial ecosystem and decisive factors for the valuation model. The last supportive objective is to use the knowledge generated by the interviews and the research to apply and modify a set of possible valuation models. The applied valuation is based on a Brazilian tech-startup from Rio de Janeiro, Whatsapp Automação. This includes a prior analysis of the company's operative market and its prospects. Those objectives lead to the formulation of four separate hypotheses:

H1: The characteristics of the underlying pillars of the indicators of entrepreneurship are relevant for the valuation of startups in Brazil.

H2: The scorecard valuation method is suitable to evaluate the value of a seed stage startup in Brazil.

H3: The risk factor summation method is suitable to evaluate the value of a seed stage startup in Brazil.

H4: The DCF valuation method is suitable to evaluate the value of a seed stage startup in Brazil.

3. Literature Review

In this chapter the central valuation methods for seed stage startup companies and existing literature about seed stage startup valuation will be reviewed. To better explain the extent of this research a contextualization of some key terms will be done in the beginning of the literature review.

A startup is a business that is a temporary organisation designed to search for a repeatable and scalable business model (Blank, 2010). Looking at the early stages of startups Damodaran defines startups as business models with little or no revenues and operating losses and further distinguishes in the early stages of a company's life circle between idea companies that have no revenues and operating losses, start-up companies that have small revenues and increasing losses and second-stage companies with growing revenues that are moving towards profits (Damodaran, 2009).

In the context of financing startup companies there are two classes of investors, BAs and VCs. They fund those high risk and high growth businesses in order to receive high returns that compensate them for their undertaken risk. BA are usually individuals that started successfully a company in the past and are now investing their private money and experience and are willing to invest relatively small amounts into an seed stage startup (M. van Osnabrugge, 2000). VCs are professional funds that invest higher amounts and are actively involved into guiding and growing the startup (Beaton, 2010). Seed stages of capital acquisition typically include BA and VC (Denis, 2004). Both types of investors are investing into seed stage ventures, but BA are reported to invest with higher frequency than VCs (Sohl, 2007). The financial valuation of a venture is essential for the occurrence of an investment in the respective startup and the investors need the right tools in order to determine how much an investment is worth in wealth creation (Bose & Thomas, 2007).

3.1 Startup Development Stages

The startup life cycle can be categorized into different development stages. Damodaran (2009) classifies the early stages of the life cycle into three stages.

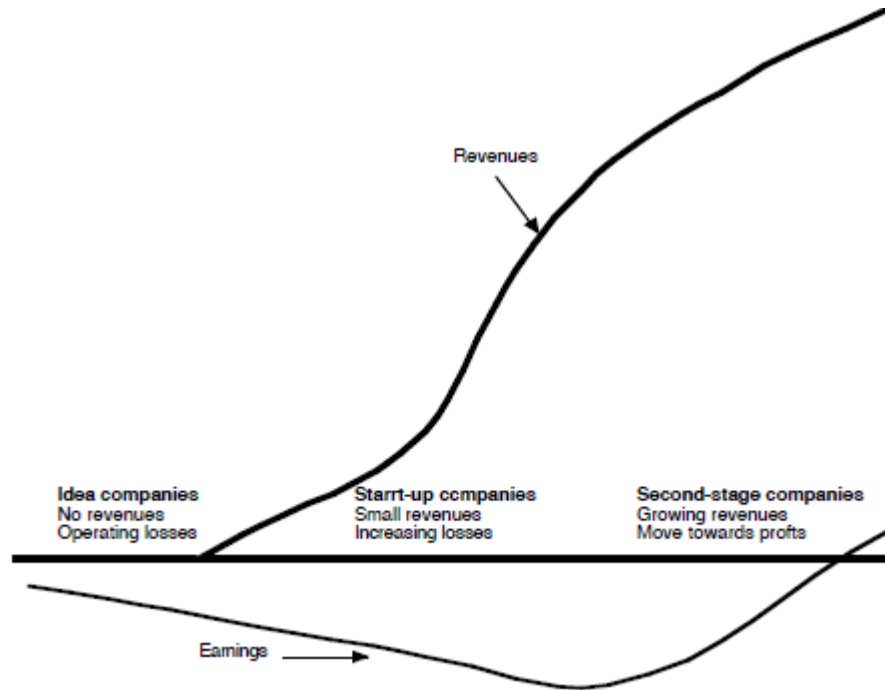


Figure 1: The Early Stages of the Life Cycle (Damodaran, 2009)

In the first stage of the life cycle the startup is considered an idea company with no revenues and operating losses. Other scholars refer to this stage as bootstrapping stage, which is characterized by high uncertainty, the composition of a team and the usage of personal funds and/or investments of family and friends (Salamzadeh & Kawamorita Kesim, 2015).

In the second stage of this life cycle model startup companies are characterized. The revenues are small, which means that the startup entered the market with his product and acquired first paying customers. Nevertheless, are losses still increasing, as the revenues are not sufficient to cover the expenses (Damodaran, 2009). Investments in product development and distribution channels are still necessary and variable costs as merchandising and marketing are vital to foster growth (Finkelstein, 2001).

Second-stage companies left the startup stage, have growing revenues and are moving towards profits (Damodaran, 2009). This means that the business model is proven, the product is accepted at the market and the former startup graduates to an enterprise (Viswanathan, 2018).

3.2 Rule of Thumb Methods

Given the low degree of available information for seed stage startups, the financial valuation of those becomes extremely challenging. The following part of the literature review presents with the scorecard valuation method and the risk factor summation method two methods that use investors to assess seed stage companies.

3.2.1 Scorecard Valuation

As seed stage startups have little, or no financial statement information and financial forecasts are uncertain, scorecard valuation methods have been popular among angel investors (York Angel Investors, 2015). The according scorecard methodology was developed by BA Bill Payne.

The first step in this methodology is to determine the average pre-money valuation of similar start-ups in the same business and geographic area. This average value or valuation range is the starting point for the valuation of a certain startup. Then the startup is being analysed regarding six categories. The scoring in those categories determines how much of the average valuation is accounted to the startup under investigation. The scoring of an average startup in each category also serves as reference for the evaluation of the startup under investigation (Payne, 2006).

Criteria	Weighting
Management Team	30%
Size of Opportunity	25%
Product/Service and Technology	15%
Marketing and Sales Channels	10%
Competitive Environment	10%
Other Factors	10%

Figure 2: Bill Payne Scorecard Model

The most important criteria according to Bill Payne is the management team with a weight of 30 %, as it is important to have a competent CEO/founder to achieve milestones and who is willing to step aside for a more experienced CEO if needed. The team does not have to be complete, but some key players should be on board (Payne, 2006). Previous studies had also pointed out that the founders experience and personality are within the most important criteria of deciding whether to fund or not to fund a startup and entitle entrepreneurial abilities as

decisive criteria (De Leó & Guild, 2003; Macmillan, Siegel, & Narasimha, 1985; MacMillan, Zemann, & Subbanarasimha, 1987). Seed stage startups are often dependent on one or a few key people for their success, so losing them can have significant effects on the startups value (Damodaran, 2010). So it has been shown that the expertise in regard of the business management and technological knowledge was significantly decisive for survival rates of startups and the attraction of funding (Gimmon & Levie, 2010).

The size of opportunity is weighted 25% in this scorecard valuation (Payne, 2006). It has been shown that investors especially look for businesses that are scalable, as they want to take the business model and roll it out on a large scale (Cohan, Kakabadse, Kossof, & Tulgan, 2013). That the size of the market and its growth potential are important decisive criteria for investors and fitting this category finds another study by Sudek (2006), evaluating VCs investment criteria.

Although the product or service itself and its underlying technology are with a weighting of 15% still important in this valuation method, its quality contributes less to the valuation of a startup than most entrepreneurs expect. Investors prefer to bet on an A+ team with a B product idea every time over a B team with an A+ product (Payne, 2006). This relatively low importance is consistent with other findings from studies about VC criteria, as Van Osnabrugge (1998) ranks the quality of the product 7th out of 27 VC investment criteria. For seed stage startups a viable product is not elementary as experimentation with the product is part of the development process (Moogk, 2012). Also in Sudeks (2006) study about angel investment, only two criteria are referring to the actual product and are present at the 10th and the 15th position out of 25 different aspects.

For startups, marketing activities are significant percentages of the overall expenses, but also viable for the success of the venture, so they are weighted with 10% in the scorecard approach. Especially startups with technologically-based products or services must closely integrate marketing and technology strategy to be able to accomplish marketing goals and market prospects (Lucas Jr., 1994). And Li (2001) concludes that the marketing differentiation strategy plays a significant role in mediating the positive effect of perceived industry growth on a startups performance.

10% of the valuation is linked to criteria of the competitive environment (Payne, 2006). One study conducted by Romanelli (1989) concludes that the competitive environment is unrelated to a startups survival rate. But on the other hand, researchers also found differences of how the

external cluster environment effects startups. The levels of skilled labour, suppliers and purchasers have been reported to be beneficial, while local competition has a value destructive influence (Pe'er & Keil, 2013).

The section other factors which contributes 10% to the valuation gives the evaluators the flexibility to take other positive or negative aspects, affecting the startup, into consideration (Payne, 2006).

For a reliable calculation of the final score, a comparable score is needed. This comparable score should come from a comparable startup, for which a profound inside knowledge of the competitors' company is essential (Payne, 2006).

3.2.2 Risk Factor Summation Method

Another more experimental method for calculating a startups value is the risk factor summation method, which compares 12 risk characteristics of a startup. This method is similar to the scorecard valuation method, as it adjusts the average startup valuation of similar companies in the same geographic region based on the assessment of 12 risk factor characteristics (Payne, 2013). The 12 risk factors included in the model are the following:

- Management Risk
- Stage of Business
- Legislation/Political Risk
- Manufacturing Risk
- Sales and Marketing Risk
- Funding/Capital raising Risk
- Competition Risk
- Technology Risk
- Litigation Risk
- International Risk
- Reputation Risk
- Potential Lucrative Exit

After determining the average valuation of similar startups in the same geographic region each risk factor is evaluated on a scale from -2 to 2 and the value is adjusted positively by \$ 250.000 for every +1 and negatively by \$ 250.000 for every -1 (Payne, 2011).

The advantage of this method is a comprehensive analysis of the risk factors for startups, as a negative assessment of a risk factor can damage a startup's development and a positive assessment of those risk factors can increase the probability of success. This assessment of risk factors is consistent with numerous research about risk factors for startups, whose results can be related to the mentioned risk factors. Van Geldern, Thurik and Bosma (2005) conclude in their study about success and risk factors in the pre-startup phase that the market risk, the amount of capital, experience in setting up a startup and information and guidance are the most influential risk and success factors. Duchesneau and Gartner (1990) conclude in their study about venture success that the management experience and planning efforts were among the most important success factors.

3.3 Discounted Cashflow Methods

The corporate finance theory defines the economic value of an investment as the sum of all discounted future cashflows of this investment (Brealey, Myers, Allen, & Mohanty, 1988). Based on this principle builds up another model for valuing seed stage startup companies, based on the DCF method. This method is used by a significant amount of investment managers for startup valuation for example in Germany (Dittmann et al., 2004).

3.3.1 The Damodaran Approach

One of the most reputable valuation experts, Aswath Damodaran promotes the usage of the DCF approach, as he states that the intrinsic value of a cash flow-generation asset is a function of how long you expect it to generate cash flows, as well as how large and predictable these cash flows are (Damodaran, 2010). The assumption behind this valuation method is that finally only the excess cashflows are relevant for the investor. Therefore, the primary basis of this approach is the amount of money remaining after subtracting cash outflows from cash inflows. The second important component is an adequate discount rate, whose determination is crucial for the success of the DCF method (Trigeorgis, 1995). The discount rate serves as a vehicle for all the uncertainties a startup faces (Damodaran, 2009).

The DCF method is based on an estimation of future revenues, but not too far into the future, as the common planning horizon is two to five years. VCs tend to match the forecast period with the expected investment period. At the end of the forecast period a terminal value is calculated by using the formula for estimating the terminal value of the cashflows. The estimated values need to be discounted by the VCs target rate of return, reflecting the perceived

business risk and the likelihood of failure. Typical target rates of return for startups in the early stage of their life cycle range according to Damodaran between 50% and 70% and he recommends a short estimation period from three to five years (Damodaran, 2009).

The DCF method faces several limitations when applied to the valuation of seed stage startups. According to Damodaran one of the main problems is the unavailability of historical data, as many startup companies only have one or two years of data available. As the basis of the DCF approach is growth, its estimation becomes very subjective, when historic data is absent (Damodaran, 2009). Young and early stage startups also tend to have little revenues and earnings, which further complicates the matter of determining and justifying a suitable growth rate. Additionally, the DCF method does not have the flexibility to account for stops and changes in the development process, as the analysis is based on linear scenarios (van de Schootbrugge & Wong, 2013).

The high importance of the terminal value is another limitation of the DCF approach. The terminal value can account for more than 50% of the value of the company in the valuation of traditional companies (Vernimmen, Quiry, Dallochio, Le Fur, & Salvi, 2014) and also in the valuation of startup companies the terminal value may represent by far the largest proportion of the total (Mills, 1998). This means that the right estimates of the growth rate, regarding existence, timing and level, have significant impact on the terminal value.

Another limitation of the DCF method arises from the challenge of determining the right discount rate. The incorporated risk should be reflected by the discount rate used, but often startups will experience different levels of risk over the years and it is close to impossible to estimating a correct discount rate for a changing risk over time (van de Schootbrugge & Wong, 2013). Damodaran suggests using market prices for a company's securities to estimate a company's equity beta and to use publicly traded bonds to estimate the cost of debt. This approach is challenged by the fact that most seed stage startups do not have any public bonds outstanding, which makes it impossible to calculate an equity beta (Damodaran, 2009).

The DCF approach by Damodaran is summarized in the following formula:

$$V_F = \sum_{t=1}^T \frac{E(FCFF_t)}{(1 + \text{Cost of Capital})^t} + \frac{FCFF_T(1 + g)(1 - \frac{(1 + g)}{(1 + \text{Cost of Capital})})}{(\text{Cost of Capital} - g)}$$

Dittmann et al. (2004) concluded in their study about the practical usage of DCF approaches that only a minority of investment managers that use the DCF approach use discount rates related to the real cost of capital. Instead they use subjective discount rates, but the use of the DCF approach only leads to a greater performance of their investment, when an objectifiable discount rate is used in the valuation process.

3.3.2 Venture Capital Method

The venture capital method is a simple valuation method developed by Harvard Business School professor William A. Sahlman. His motivation for developing this valuation approach was as well the limited validity of traditional valuation approaches. To apply this method first the business net income for the terminal year must be calculated. Sahlman uses a time horizon of five years and bases this method only on a success scenario (Sahlman & Scherlis, 1987).

To calculate the net income for the terminal year, the estimated revenues must be multiplied with a projected or industry average profit margin. Then an industry price/earnings multiple is used to compute the terminal value in year 5 (Sahlman & Scherlis, 1987).

$$\text{Terminal Value} = (\text{Terminal Net income} * \text{Profit Margin}) * \text{PriceEarningsRatio}$$

Using the terminal value and an estimated investors IRR the pre-money valuation, as well as the final required ownership, can be determined, if the investment amount is known (Sahlman & Scherlis, 1987).

$$\text{Final Ownership Required} = \frac{(1 + \text{IRR})^{\text{Years}} * \text{Investment}}{\text{Total Terminal Value}}$$

$$\text{PreMoney Valuation} = \frac{\text{Terminal Value}}{\text{IRR}} - \text{Investment}$$

One limitation of the venture capital method is the usage of a single scenario for its projections, which limits the investor or entrepreneur in his considerations of alternative development paths the business might take. Also, this method is strongly based on assumptions of how the company might develop and does not analyse profoundly the existing internal assets. The focus on revenues and earnings means also a strong internal focus that makes this method inaccurate and unjustifiable (Miloud, Aspelund, & Cabrol, 2012).

3.3.3 First Chicago Method

An evolution of the venture capital method is the First Chicago Method, developed by the venture capital branch of the First Chicago bank (Catty, 2008). Its basis is the venture capital method by Sahlman, but the underlying idea of this method is to reduce uncertainty in the valuation by doing a three-case scenario analysis. Then the method uses multiples to calculate the terminal value and then discounts it. By using three different scenarios this method considers multiple pay-out possibilities for the investor and attributes different probabilities of success to each scenario (Fullen, 2006). It can be seen as an hybrid version of a DCF approach and a multiples approach, as this method applies the DCF valuation mechanisms and uses industry's multiples to calculate the terminal value (Trichkova & Kanaryan, 2015).

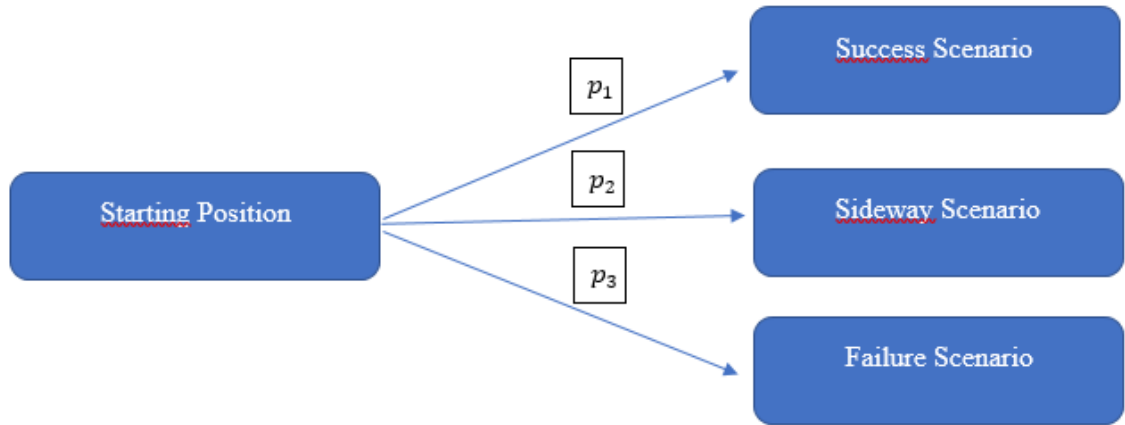


Figure 3: First Chicago Method

$$Valuation_i = \sum_{t=1}^T \frac{FCFF_t^i}{(1+r)^t} + \frac{Terminal\ Value_i}{(1+IRR)^t}$$

$$Startup\ Value = \sum_i^3 p_i * Valuation_i$$

The success scenario is the best-case scenario, assumes that the startup manages to launch an initial public offering (IPO) at the end of the investment period and is usually compliance with the business plan (Schumann, 2006). Additionally, the method assumes that yearly dividends are distributed to the investors. The inclusion of a failure scenario is consistent with other research that has shown that the survival rate of startups is only 61% in the first three years (Hyytinen, Pajarinen, & Rouvinen, 2015). Evidence from Brazil shows also high mortality rates

as two thirds of Brazilian startups go out of business within five years (GEM, 2017). The sideways scenario is the most probable scenario. In this scenario no IPO takes place, but this scenario still assumes that the investor will be able to sell his equity share of the company during a subsequent financing round to a strategic investor. In the failure scenario the worst-case is assumed, which means that the startup must be liquidated. The percentage of the to be recovered investment depends on the capital intensity, the outstanding debt, remaining cash and the company's assets (Catty, 2008).

One advantage of this valuation method is that the risk of failure must not be captured through high discount rates of up to 70% as Damodaran (2009) argues, as this risk can be included through the likelihood of occurrence of the failure and partially the sideways scenario. Additionally, this method is more complete, as it allows to include dividends in the valuation procedure. But, the First Chicago Method with its numerous assumptions about the scenarios and probabilities is also highly subjective and judgemental (Schumann, 2006).

3.4 Value Enhancing Factors

Many researchers have examined the impact of startup and business model characteristics and their relationship towards the valuation of businesses that obtain those characteristics or not. Those findings can help to provide a better understanding of success factors for seed stage startups and can be relevant to improve the valuation model.

A study focusing on the high-tech medical industry concluded that startups, which are founded by former employees of incumbent firms perform better than those that are founded by new entrants. Surprisingly the technical knowledge was not the decisive factor for the outperformance, but the founders knowledge regarding regulations, marketing and wider industry insights was (Chatterji, 2009).

Aggarwal et. al. (2012) argue that the electronic word-of-mouth (eWOM) has a significant impact on the venture valuation. eWOM is the media coverage of the startup in blogs and articles. Their findings show that positive eWOM increases the valuation and that negative eWOM decreases the valuation, whereby the effect of eWOM becomes weaker over time and is especially strong for startups in an early stage of their life cycle.

Positive effects on the valuation of startups have also been associated with intellectual property (IP) rights. The literature shows that the number and breadth of trademark applications in startups is positively related with the valuation and that in later financing rounds this effect

decreases (Block, De Vries, Schumann, & Sandner, 2014). Research also shows that startups patenting activities are associated with a higher likelihood of receiving funding and with greater amounts of funding (Cao & Hsu, 2011; Greenberg, 2013). Trademarks and IP rights have complementary effects, as the valuation is higher, if a start-up is applying for both. These effects are only existent in the initial funding round (Zhou, Sandner, Martinelli, & Block, 2016). Similar results have been discovered during an investigation between the relationship of patent applications and startup investments. In non-software industries patent applications positively impact valuations. This effect was the strongest in industries, where the products are only covered by a small number of patents and are therefore considered more valuable. Concurrently the researchers found out that there is no positive relationship between patents and the startups value, if its operating in the software industry (Greenberg, 2013).

Another factor that can influence the valuation of a startup is the implementation of Management Control Systems (MCS). A higher degree of MCSs implemented in a startup is associated with a higher valuation and the effect is stronger in competitive and high-growth environments. There is also a positive correlation between the intensity of MCSs and the firm's valuation. The study found out that the most important MSCs are systems that focus on the implementation of the startups strategy (Davila, Foster, & Jia, 2015).

A subset mechanism of MSCs are Management Accounting Systems (MAS). These MASs are associated with budgeting mechanisms, which are highly important for young and growth-oriented startups. The hiring of a financial manager, the involvement of an VC, the number of employees and the CEO experience are correlated with the adoption of MASs (Davila & Foster, 2005).

Regarding the performance of VC funds, it has been shown that VCs outperform, when their offices are located in areas with a high concentration of other successful VCs. But, the driver of their outperformance are the VCs non-local investments. This on the one hand implicates knowledge spill overs between the VCs in high concentration areas and on the other hand compensation for the higher costs regarding monitoring and traveling for the non-local investments. (Chen, Gompers, Kovner, & Lerner, 2010).

3.5 Indicators of Entrepreneurship

Previous studies of startup valuation models and venture capital contributing to the theoretical foundation of the valuation model have been mostly undertaken with U.S. or European based

startups and investors. This chapter aims to explore determinants of entrepreneurial performance to set a foundation for a deeper analysis of those factors in the context of Brazil's entrepreneurial environment.

The review of the determinants of entrepreneurial activity is mostly based on a macrolevel analysis of those factors. Those higher level environmental forces are expected to have transitive influences on organizations through their impacts on a lower level force (Castrogiovanni, 1991) and can therefore influence the valuation of a startup. Also the use of strategy is dependent upon the type and level of environmental uncertainty (von Gelderen, Frese, & Thurik, 2000). This allows to better analyse the entrepreneur's responses and draw conclusion to the capabilities of the management team, which can be the most decisive factor in the scorecard valuation (cf. chapter 3.2.1). Consequently, the inclusion of country-specific determinants in the valuation model and an assessment regarding implied uncertainties can lead to a more accurate valuation. This will be complemented in the analysis with insights from the expert interviews.

As a framework for the analysis of environmental factors affecting startups, the OECD determinants of entrepreneurship model was chosen, which consist of six single factors in the pillar of determinants. These are the regulatory framework, R&D and technology, the entrepreneurial capabilities, culture, the access to finance and the market conditions. These determinants consequently affect the entrepreneurial performance and have an economic impact (OECD, 2009). The pillars of the entrepreneurial performance and the impact are not included in this research.

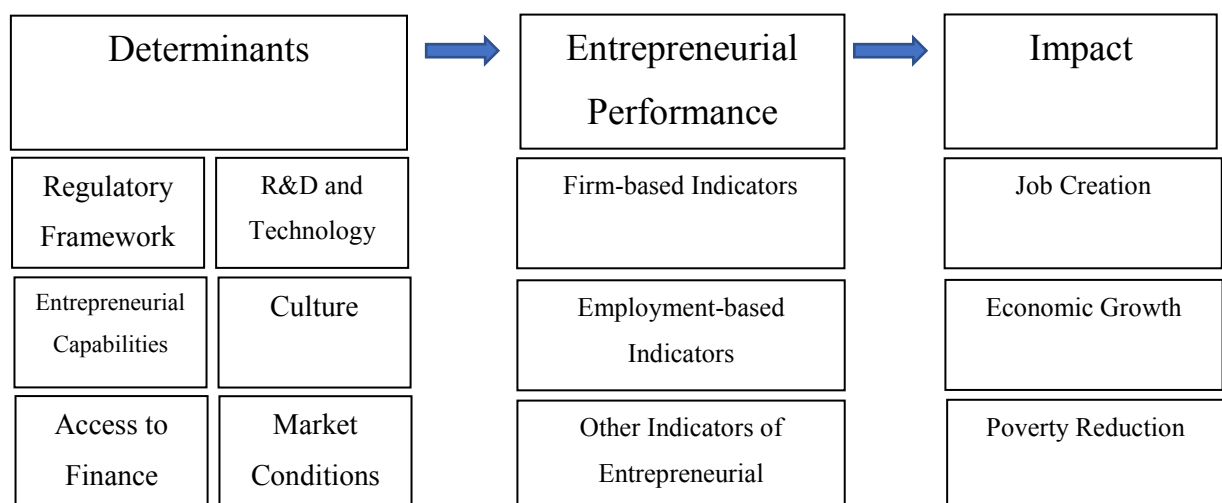


Figure 4: Topic categories for entrepreneurship indicators (OECD, 2009)

Regulatory Framework: The regulatory framework includes perimeters like property rights, institutions for resolving disputes, bankruptcy laws and the protection of contractual partners. Additionally, regulatory framework incentives like tax incentives, the conditions of research institutions and an overall venture friendly legislation contribute to this pillar (Isenberg, 2011). Two proxies for the quality of the regulatory framework are the ease of doing business ranking and the global entrepreneurship index (OECD, 2009).

R&D and Technology: High-growth entrepreneurship is linked to knowledge creation, as successful entrepreneurship depends on innovation and R&D. Business R&D has the closest link to new products and production techniques and is therefore more important for entrepreneurship than R&D undertaken by the government. The entrepreneurial activities arising from R&D and technology are likely to be more successful, if they are new to the market or the world (OECD, 2009).

Entrepreneurial Capabilities: High entrepreneurial capabilities are correlated with the percentage of the population between 18 and 64 that is trained in starting a business and with the percentage of international students taking part in a country's tertiary education system and in a country's advanced research program (OECD, 2009). Other determinants of entrepreneurial capabilities are the quality of management schools, the inflow of foreign labour and migrants with tertiary education (OECD, 2011).

Culture: Culture are discrete/distinct behavioural norms and cognitions, which are shared by individuals within some definable population that may be distinct from those within other populations (Lehman, Chiu, & Schaller, 2004). In the context of entrepreneurship culture has an influence on the risk taking behaviour, the social acceptance of failure and the individual's conjectures about the desirability of the entrepreneurial action (Z. J. Acs, Autio, & Szerb, 2014).

Access to Finance: The access to finance pillar covers the availability of micro loans, the state of private investors like BAs, VCs and private equity and the state of public capital markets (Isenberg, 2011). Particularly VC for innovative high-growth firm differs significantly among countries and especially startups in the seed stage often have greater difficulties of finding investors. The ease of access to loans and the condition of the BAs and VCs activities are suitable to further examine the access to finance (OECD, 2009).

Market Conditions: The main factor of the market conditions is the state of the competition law, which can be divided into an antitrust framework and network policies. The antitrust

framework assesses the scope and enforcement of law and independence of competition authority. Network policies indicate the independence of sector regulators and network access. A marginal role play export and import burdens (OECD, 2009).

4. Methodology

The intention of this thesis is to understand the functionality of different valuation approaches for seed stage tech startups in Brazil. By analysing the presented valuation models, the entrepreneurial pillars, interviews with experts from the field and the application of different valuation models on the case of a seed stage tech startup this study will assist in giving a better understanding of the valuation practices, its determinants and influencing factors.

4.1 Research Design and Data Collection

The valuation of established companies is based to a great extent on hard financial data, like the balance sheet, the income statement, free cash flows, economic value creation and real options (Fernandez, 2002). Many approaches for seed stage startups are more focusing on entrepreneurial characteristics, which are more difficult to standardize and to quantify. To assess how valuations of seed stage tech startups in Brazil are undertaken and why some factors matter more than others an exploratory research design is chosen. As the matter of the research addresses a contemporary event and no control of behavioural event is applicable, the case study approach appears to be an appropriate way to address the research question (Yin, 2014). Woodside (2010) defines case study research as an inquiry that focuses on describing, understanding, predicting, and/or controlling the individual. And Gerring (2006) argues that case studies are an intensive study of a single unit or a small number of units, for the purpose of understanding a larger class of similar units. This defines the extend of this research focuses on a case study. Case studies generally combine different techniques for data collection, such as interviews, observations, questionnaires and document and text analysis to investigate a contemporary phenomenon (Darke, Shanks, & Broadbent, 1998), and so will this study link extensive literature analysis, with interviews, their analysis and the application of different valuation models.

A frequent criticism of case study methodology is that its dependence on a single case renders it incapable of providing a generalizing conclusion and that case study research therefore lacks robustness (Tellis, 1997; Zainal, 2007). So, it is important to highlight that the intention of this

study is to enlarge the understanding of the valuation process and its determinants of seed stage tech startups in Brazil regarding existent knowledge.

An extensive review of the literature dealing with seed stage startup valuation explores what currently established valuation models and its determinants are. It also includes a short review of the indicators of entrepreneurship, which will be analysed in the subsequent measures.

The analysis of the indicators of entrepreneurship will be applied to the ecosystem the subject of this studies is located in, which in this case is Brazil. The analysis will be conducted by applying two research techniques. The foundation of the analysis will be set by analysing existent literature and secondary data of the characteristics of entrepreneurship. This is necessary for the development of expertise needed to specifically address entrepreneurial characteristic in the semi-structured interviews and to explore its relevance for the valuation process. Then the gained knowledge from the semi-structured interviews complements the analysis about the indicators of entrepreneurship and helps to conclude on implications for the valuation of seed stage startups in Brazil.

The mentioned semi-structured interviews are one of the primary data sources in this research design and the most important data collection method. Conducting interviews is not a trivial enterprise, it requires active listening and notetaking, as well as careful planning and sufficient preparation. It requires a thorough selection of suitable interview partners, the right selection of an interview type and the proper analytical tools (Qu & Dumay, 2011).

The last part of this research, which is supported by the literature review and the interview findings is the application of different valuation models on the case of one seed stage tech startup in Brazil. This includes making assumptions, based on the previously discussed analysis of the ecosystem and the interviews, especially with the founders of Whatsapp Automação, the company, subject of the valuation. A modification of existing approaches is necessary to include some decisive characteristics and leads to a better understanding of the startup valuation process in Brazil. The comparison to the original approach reveals the impact of newly added criteria and the country specific information. Additionally, an analysis of the market, the startup is operating in, is included and serves as a foundation for the valuation.

4.2 Selected Sample and Data Analysis

For this case study research three decisions regarding the selection of samples and therefore the data analysis must have been made. First, this thesis makes use of qualitative and semi-

structured interviews. Second, it uses the case of a seed stage tech startup from Brazil, Whatsapp Automação. And third, a selected sample of seed stage valuations of Brazilian startups is used for the conducted valuations.

4.2.1 Interviews

As the objective was to narrow down specific areas of the valuation process and the entrepreneurial ecosystem in Brazil, a semi-structured interview approach was chosen. Semi-structured interviews are flexible, accessible and help to disclose hidden information (Qu & Dumay, 2011). Furthermore, they allow the researcher to explore complex issues by taking into account overall beliefs and opinions (Barriball & While, 1994). Semi-structured interviews are a flexible research tool giving the interviewer the opportunity to react immediately to the information given by the interviewee (Longhurst, 2003).

The selection of interview partners was based on two criteria: First, the experience with startup valuation. Second, the level of involvement with the Brazilian entrepreneurial ecosystem and the function of each interview partner in the ecosystem. The aim was to ensure a comprehensive knowledge about the investor's side, the influence of the government and the entrepreneur's side of the valuation.

In accordance with the sampling strategy six different interview partners with experience in startup valuation in Brazil were selected:

- Two investors from a venture capital fund, specialized in tech startups.
- One representative from the Funding Authority for Studies and Projects (FINEP), which is the leading governmental funding authority in Brazil.
- One entrepreneur and startup consultant active in different parts of America and based in Rio de Janeiro.
- Two entrepreneurs from the Brazilian tech startup Whatsapp Automação, seeking funding for the first time.

Four face-to-face interviews were conducted individually with the venture capital investors, the representative from FINEP and the startup consultant, with each interview lasting about 45 minutes. The interview with the two entrepreneurs from Whatsapp Automação was conducted also face-to-face with both individuals being present at the same time, lasting about 2 hours. Studying such a diverse set of members of the entrepreneurial ecosystem in Brazil will add fundamental practical knowledge to the theory. The questions for the interviews are listed in

Appendix A and leave space for individual questions, in accordance with the semi-structured interview approach. The interviews were recorded and immediately transcribed for the analysis of the valuation practices as well as the entrepreneurial ecosystem characteristics.

4.2.2 Whatsapp Automação

The company Whatsapp Automação is a seed stage tech startup from Rio de Janeiro and the subject of the application of different valuation approaches.

The startup wants to facilitate the process of customer support via the integration of their product “WhatsApp Point of Contact” as interface between the client’s company customer support and the client’s customer itself. The main feature is the automated WhatsApp software, which allows clients to respond automatically to customer requests and contains many functionalities of chatbots. Additional features, like the WhatsApp marketing tool and an interactive training academy are under development, and expected to enlarge the company’s portfolio soon, but need further investment. Whatsapp Automação’s product helps the client to attend their customers through WhatsApp and to therefore to scale their customer service. The promise is that most customer requests can be handled automatically by the software and only a few cases need further handling by employees in the service department, whose processes are simplified and improved as well. Additionally, a feature for purchasing goods and processing payments through WhatsApp will be included. This allows companies using the product as a new sales channel. Whatsapp Automação’s product is based on WhatsApp business API (Application Programming Interface).

The last year the startup spend with the process of developing the underlying software and is currently experimenting and finetuning the product with a small number of customers. Whatsapp Automação fits the definition of a seed stage startup with little revenues, negative profits and no financial history. Its only assets are the founders and their capabilities and the developed software. The startup has not received any external capital investments, besides the owner’s personal funds to finance the prototype’s development process so far.

4.2.3 Comparable Companies

For the application of the scorecard valuation method and the risk factor summation method a set of comparable company valuations is needed. The information about the seed stage startups was retrieved from the database AngelList. Only startups receiving their first investment were considered and a total dataset of 203 Brazilian startups was retrieved. After eliminating startups

with insufficient information 167 startups remained in the dataset. Of those startups all contained information about the amount invested in the seed stage financing round, but only 53 had information about the pre-money valuation underlying the financing round. The valuation of the remaining 115 startups was estimated accordingly to the following information: The average equity share taken by the investor during the seed stage investment round of those startups with data about the valuation was 20.1%. This is consistent with the information gathered during the research as Expert 1 states that: *“It is important to have around 20% share of the early stage start-up in order to reach your target returns.”*. Consequently, the pre-money company valuation of the 115 startups without information was estimated with the average investor equity share of the 53 companies with sufficient information. For the valuation four groups of comparable companies were formed. The first group (N=5), included startups operating in the same industry as Whatsapp Automação. The second group of startups (N=53) contained all startups with real valuation data available. The third comparison group (N=107) were all small startups (with 1-10 employees) and the projected valuations were included. The fourth group (N=167) contained all startups with real and projected valuation.

5. Analysis and Discussion of the Results

In this part of the thesis the findings of the research will be analysed. This part is divided into three main areas, where the findings from the secondary data analysis, the conducted interview analysis and the study of the valuation models, applied to the startup Whatsapp Automação, are compiled and evaluated. First, the results of the analysis of the Brazilian entrepreneurial ecosystem, based on secondary literature and the expert interviews are presented. Then follows a short market analysis, necessary for the application of the valuation models. The last part of the analysis deals with the application, modification and comparison of three different valuation models and finishes with a comparison and evaluation of the three valuation approaches.

5.1 Analysis of the Brazilian Indicators of Entrepreneurship

To better assess the entrepreneurial environment and to discover implications for the valuation process of seed stage startups in Brazil, the OECD pillars of entrepreneurship serve as a guideline to analyse macro-economic factors and to connect those factors to the valuation. The particularities discovered during the research of secondary data served as an indicator for points of interest for the valuation process and helped designing interviews. Only the determinants of entrepreneurship were analysed. The results of the secondary literature analysis are enriched by the key finding from the interviews and its implied significance for the valuation model is

discussed in every section separately. The full analysis of the interviews and its key findings are summarized in Appendix B. At the end of each short analysis, the implications for the valuation process are emphasized.

5.1.1 Regulatory Framework

The ease of doing business report covers São Paulo and Rio de Janeiro, the two biggest cities and entrepreneurial hubs in Brazil with a weight of 61% and 39% in its report. Brazil is ranked the country number 109 out of 190 countries in 2018 (60.01/100 points) in this report. Significant recent improvement are the start of an online registering system for startups, the ongoing modernization of the electricity grid, the introduction of electronic certificates of origin, simplifying trading across borders and liberalizing labour market regulations (World Bank, 2019). Another index assessing the regulatory framework is the global entrepreneurship index, which ranks Brazil number 98 out of 137 countries in 2017 (20.3/100 points), with only Paraguay and Venezuela ranked worse in South America, even though the development trend implies a better positioning (Z. Acs, Szerb, & Autio, 2017).

On important regulatory issue is the confusion, complexity and injustice of the Brazilian taxation system. Over 90 different taxes are charged on federal, state and municipal level and sum up to serious costs for startups and entrepreneurs (Chua, 2018). Moreover, the signalling from politicians regarding future improvements is unclear. Software companies face the risk of double taxation, as it is allowed for municipalities to charge service taxes (ISS) and at the same time service taxes (ICMS) on software products (Dias, 2016; Portal Tributário, 2018). The amount of these taxes varies from state to state and complicates taxation especially for unexperienced entrepreneurs. This is occurring in a sector which is 95% dominated by small sized companies (Prescott, 2018). At the moment Brazil charges in average 34% of companies' revenue as tax (Fernandes, 2018). The complexity of the Brazilian legal system also leads to lead to high bankruptcy costs which are on average 44% higher than the costs of opening a company (McKinsey & Company, 2019). For microentrepreneurs the Brazilian government simplified the business registration process and set fix taxes ranging from R\$ 45 to R\$ 50 per month. This applies to companies with a revenue between R\$ 36.000 and R\$ 60.000 with the aim to help small enterprises (SEBRAE, 2016). But when exceeding R\$ 60.000 in revenues the taxation system becomes much more complex (da Motta, 2016).

Additional findings about the regulatory framework were concluded from the expert interviews. Expert 1 mentioned: *“The regulations are strict and the costs for the bureaucracy are high.*

The government has a lot of support programs on the state level through BNDS and FINEP but lacks in support in the lower levels.”. Expert 2, when talking about bureaucracy in Brazil, states that: “Entrepreneurs, those with a technical background and without experts of administration in their team face problems. But serial entrepreneurs know the process and have the necessary contacts to manage.”. Expert 1 also calls attention to macroeconomic issues, as he states that: “The political stability here is less uncertain, which we have to consider. We also have a higher variation in the exchange rate. The monetary policy is also more uncertain, and we have higher levels of inflation than in the US. There is a constant need for having a close look at the economy.” Expert 3 mentions another problem as he said that: “The regulations are also very important. Here in Brazil the investor is much less protected by regulations compared to more mature markets, like the US and Canada.”.

- ➔ The high degree of bureaucracy in Brazil implies additional administrative costs. Even though the regulation is favourable for microentrepreneurs the complexity of the tax system complicates planning ahead. For the valuation process this means that additional expenses must be included in the forecast of future cashflows. The presence or the easy access to the service of a legal expert can be especially valuable in Brazil.

5.1.2 R&D and Technology

Regarding its innovation performance, Brazil is ranked in the medium range (64th) according to the Global Innovation Index, behind other emerging countries like China (17th) and Russia (46th) (Cornell University, INSEAD, & WIPO, 2018). Furthermore, the nature of innovation in Brazil can be mostly characterized as catch-up innovation rather than frontier innovation. This means that the innovations introduced by Brazilian companies are to a large extent adapted from existing technologies from other markets (Zuniga, De Negri, Dutz, Pilat, & Rauen, 2016). The overall spending on R&D by the government and private enterprises was 1.3% of the GDP in 2015. This is significantly less than the US (2.7%), France (2.2%) or China (2.1%) spend, but still more than Russia (1.1%) and Chile (0.4%) (numbers from 2016). Brazil (3.3 patents / million inhabitants) registers significantly less patents than Chile (7.1), Russia (7.9), China (15.2), France (117.2) or the US (173.1). One reason for this is the inefficient patent application process which takes 14 years in Brazil (McKinsey & Company, 2019).

Talking about R&D with Expert 2, he says that: *“Rio, with its universities provides a good basis for research. The government is supporting this, by forcing companies to invest 1% of its*

revenue in R&D. One half goes to universities and other institutions, whereas the other half can be used for internal R&D.”

➔ R&D is underdeveloped in Brazil and technological innovations from Brazil are often not new to the world. This means that an opening of the market future may allow foreign competitors to force Brazilian companies whose products cannot compete technologically out of the market. It also means that the chances for the internationalization are often lower, as the products might be underdeveloped. The law forcing companies to invest at least 1% of their revenue for R&D shows that companies are not driven by innovation. At the same time, do the low investments in R&D, in combination with the closed market (cf. chapter 5.1.6), mean that there is a lot of free space for tech startups to evolve, even when the idea is just copied.

5.1.3 Entrepreneurial Capabilities

The number of international students in Brazil has grown by 112% from 2010 to 2018 (Gazeta do Povo, 2018). But, it is still on a low level, as international students represent less than one percent of the students at Federal Universities (Toledo & Marques, 2018). Compared to the average of 12% international students in OECD countries this number is remarkably low (OECD, 2018). Another limiting factor of the entrepreneurial capabilities in Brazil is the educational system. Only 15% of Brazilian children are expected to receive a tertiary education (high school or higher) and only 7.3%/27% of public school students will demonstrate the math/reading and writing skills at the level they should by the end of high school (Mizne, 2019). Studies about entrepreneurship confirm this, as only 47% of all Brazilian entrepreneurs have a tertiary education (GEM, 2017).

Expert 3 commented on the entrepreneurial capabilities that: *“Students who go to public schools have no chance compared to students from private schools. There are also huge regional differences between the northeast and the southwest and children from rural areas still lack behind children from urban areas. Most Brazilian entrepreneurs I know received a good education.”* Expert 1 mentions that other capabilities besides the education are important as well: *“There are things like passion, which the entrepreneur needs to show and an entrepreneurial spirit. The team must have one leader, who is able to execute and who is the driving force in the team.”*

- ➔ When evaluating seed stage startups the management team plays an important role (cf. chapter 3.2.1). On average the level of education is lower than in Europe and North America, but the lower level of education cannot lead to the conclusion that entrepreneurs have a lower education level. For investors other characteristics, like leadership and the entrepreneurial spirit are also very important, when it comes to entrepreneurial capabilities. The fact that the overall education level is low can imply a shortage of well-trained labour, crucial for tech startups, and resulting in higher personnel costs.

5.1.4 Culture

It is reported that there is a fear of failure widespread in the Brazilian entrepreneurial environment and this consequently leads to higher risk aversion. On the other hand, Brazilian entrepreneurs often show great initiative, mostly motivated by income generation. This leads to a profile of necessity-driven entrepreneurs, contrasting to the more desirable opportunity-driven entrepreneur, who takes great risks in exchange for the possibility of achieving significant financial gains (Arruda, Nogueira, & Costa, 2013).

Expert 1 states that: *“It’s not common to say that you’re disagreeing with somebody. People tend to keep it for themselves and then still act how they think it’s best.”* Regarding other cultural aspects of entrepreneurship, he mentions that: *“Brazilians are also not as entrepreneurial driven as Americans.”* and that *“many successful entrepreneurs in Brazil retire too early, as they stop acting as an entrepreneur and improving their business, after being financially sorted.”* The role of women was also covered in some interviews. Expert 1 criticizes the social constraints regarding the inclusion of women and argues: *“Brazil is quite a machismo country, and this keeps woman from becoming an entrepreneur. There is only little inclusivity for women in entrepreneurial activity.”*

- ➔ During the valuation process the valuator needs to pay special attention to the entrepreneurs drive and their motives. Founding a startup means taking risks and often failure. The entrepreneur needs to be ready for this. There is also the risk for a startup, led by a female entrepreneur, to be less successful, because of discrimination and sexism.

5.1.5 Access to Finance

An important role in the funding process for new technology-based companies plays VC. It helps to promote the disruptive innovations developed by those startups and is therefore a decisive factor for successful entrepreneurship (OECD, 2017). In Brazil the VC availability is

decreasing. It dropped from 2.6 in 2014 to 2.5 in 2015 (scale 1 (worst) – 7 (best)) and is since then stagnating on this level. But, Brazils positioning compared to other economies in this ranking is deteriorating, as Brazil was ranked number 80th in the world in 2014 and only ranked at the 103rd position in 2018 (WEF, 2014, 2018). Compared to Russia, India, China and South Africa, which form together with Brazil the BRICS, Brazils ranks behind in the VC and private equity index. The VC industry in Brazil is also still very dependent on foreign investments. Between 1994 and March 2008 two thirds of the VCs investments were made in USD and in 2003, 2005, 2013 and 2017 there was no fund raised in BRL (Insper, Spectra Investments, & ABVAP, 2018). Regarding the financial market, Brazil has developed an infrastructure that ranks ahead of many of the developed countries (Groh, Liechtenstein, Lieser, & Biesinger, 2018). But the challenging macro-economic environment in Brazil was identified as a driver for cross-country variation regarding small and medium-sized businesses, as the amount of outstanding loans for those businesses decreased by almost 20% in 2016 and roughly 12% in 2017 (OECD, 2019).

Talking about the access to finance Expert 5, who already found a startup in the past, mentioned that: *“First, I invested my own funds [...] when I needed an investment [...] it was difficult to secure equity investments, as the process is slow and bureaucratic.”*. Also, Expert 3 discussed the access to finance, and he says: *“The number of investors is growing, but investors still need more support in learning how to invest in a startup. Brazil is receiving the mayor share of all venture capital investment. Up to 50% goes to Brazilian companies. But for many startups it is still difficult do get the initial investment.”* A similar opinion has Expert 4, as he states that: *“In general, the VC industry in Brazil is quite young, far behind the US, and more careful about high risks.”* Expert 2 confirms the entrepreneurs point of view about the difficulties of receiving an investment but also comments on probable reasons and states: *“It is difficult to receive investments, [...] but, also entrepreneurs who show up with just an idea, a not working prototype or no proven record of success shouldn’t be surprised by this.”*

- ➔ The VC industry in Brazil is not as strong as it could be, and entrepreneurs complain about the difficulties of getting the initial investment. This can lead to a high competition for investments and raise the startups fundraising costs. As investors tend to avoid high risks, entrepreneurs should show some traction.

5.1.6 Market Conditions

One critical pillar regarding the market conditions are competition laws and policies, which consist of antitrust and network policies (OECD, 2009). The Brazilian antitrust laws experienced a major change with law number 12.529, which was approved in November 2011 and fully operative by end of May 2012 (Panizza, 2013). Since its implementation the antitrust laws were complemented by 20 additional regulations issued by the CADE. In Brazil current antitrust regulations include public, as well as private companies and include all sectors of the Brazilian economy (Andrade, de Oliveira, & Verissimo, 2019).

A second important factor are export and import burdens, which are measured in the costs and time of the export/import process (OECD, 2009). In recent years Brazil was able to reduce the import/export costs and the time to import/export significantly and improved its ranking in the corresponding pillars of the doing business report from the 149th position in 2017 to the 106th position in 2019 (World Bank, 2017, 2019).

Examining the share of exports and imports on the GDP Brazil reports a share of less than 30%, whereas all the other BRICS report shares above 50%. That Brazil is one of the most closed economies in the world is also caused by its economic structure, which relies heavily on a domestic value chain rather than the participation in global production networks. This shows a lack of dynamism, as only a few and mainly large companies export, and even fewer become new exporters. It also shows Brazil disconnection regarding global value chains and implies challenges in productivity and competitiveness (Canuto, Fleischhaker, & Schellekens, 2015).

Expert 3 comments on the market conditions: *“Brazil is one of the largest economies in the world [...] but this market is not developing fast enough. The high taxes on imports [...] impede companies to invest in more advanced technologies.”*

- ➔ For the valuation process this means that companies with business models, relying heavily on imports and/or exports must be valued more carefully and those barriers must be taken into consideration. The impact of those barriers depends on the export/import intensity, the counterparty country and the product. Brazilian companies have also less competitive pressure, as high entry barriers for foreign companies exist.

5.2 Market Analysis

As, stated before Whatsapp Automação is based on Whatsapp Business API (cf. chapter 4.2.2). The market for WhatsApp automated services is still under development, as WhatsApp

launched their Business API in August 2018 (Melchior, 2019). To better understand the dynamics in the industry initially a short analysis about the software market in Brazil is conducted. To assess the opportunities for Whatsapp Automação an analysis of the social media advertising market, the customer service in Brazil and the importance of WhatsApp in Brazil is undertaken as well.

5.2.1 Software Market

The IT sector in Brazil had a total volume of US\$ 38.1 billion in 2017. Hardware accounts for the largest share of the IT market with 51.2% (US\$ 19.5 billion), services account for 27.4% (US\$10.4 billion) and software for 21.4% (US\$ 8.1 billion) (ABES, 2018). The software sector in Brazil has been growing from US\$ 2.3 billion in 2006 to US\$ 8.3 billion in 2015, with growth rates between 6.2% and 21.7%. Simultaneously with the slowdown of the Brazilian economy in 2015 and 2016 with growth rates of -3.55% and -3.47% the software sector shrunk by 2.5% in 2016 and just slightly recovered with a growth of 4.7% to a volume of US\$ 8.5 billion in 2017. Only a minor share of 23.5% (US\$ 2.0 billion) of the software sector are domestic developments, whereas 74.4% (US\$ 6.2 billion) are foreign developments and only 2.1% of Brazilian software developments are related to the export market (ABES, 2018; Worldbank, 2019b).

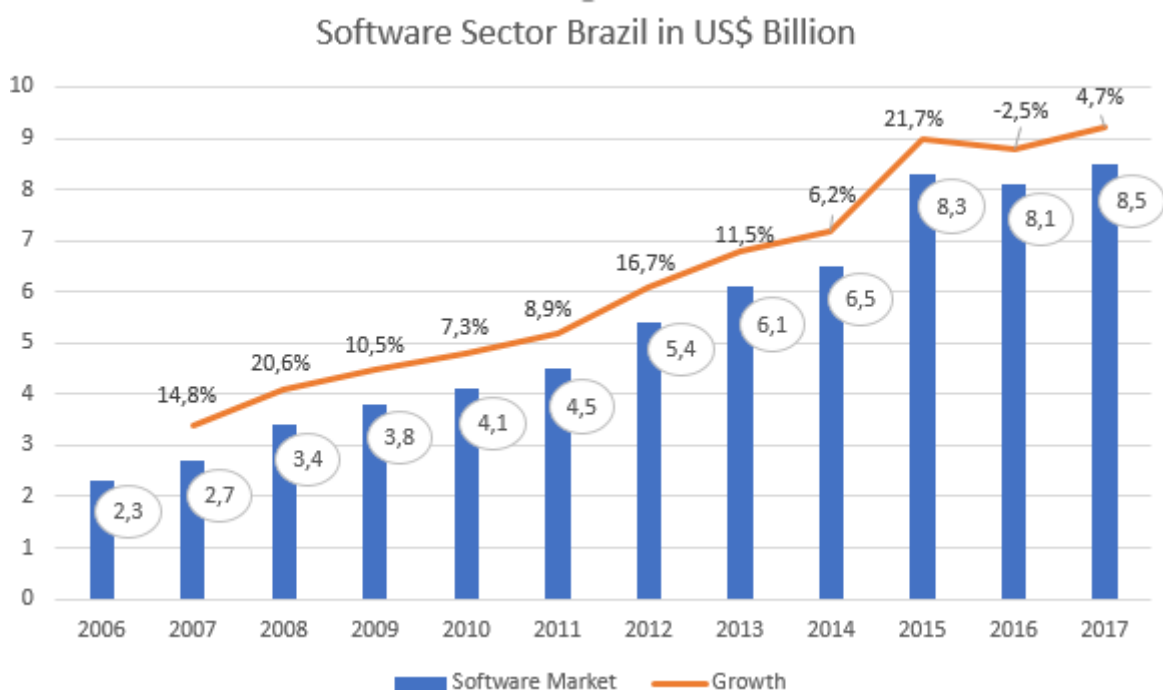


Figure 5 Development of the Software Sector in Brazil (ABES, 2018)

Looking at the digital devices market in Brazil the outstanding position of smartphones becomes visible. 49 million smartphones were sold in Brazil in 2017, significantly more than the 1.7 million desktop PCs and 3.4 million notebooks during the same period. At the same time the number of installed PCs and notebooks decreased continuously from 64.4 million in 2015 to 51.0 million in 2017 (ABES, 2018). This indicates that especially consumers in Brazil tend to not own a PC anymore and instead exclusively use smartphones.

5.2.2 Social Media Advertising and Customer Service

Whatsapp Automação is active in the social media advertising business and is developing solutions for customer service applications. Moreover, it is exclusively working with WhatsApp's business API. Therefore, a more profound analysis of the role of WhatsApp and social media, social media advertising and the customer service in Brazil is contributing to a more accurate valuation.

Regarding the usage of the leading social media platforms, including Facebook, Instagram, YouTube, Netflix and WhatsApp, Brazilians are ranked number 2 or 3 in the world. The smartphone penetration rate in Brazil is 71%. As mean of access to the internet dominates the mobile phone access, accounting for 90% of the internet users, leading significantly before the second rank, the access via laptop with 38% (McKinsey & Company, 2019). Taking a closer look at WhatsApp an outstanding position as cross-platform communication software can be identified. Brazilians spend 3.4 hours per day on social media and 83% of internet users use online chat platforms daily, whereby WhatsApp is the most popular one. Only looking at computer accesses, web.whatsapp.com is the 10th most visited website in Brazil. In total WhatsApp can account for 120 million users in Brazil and has a penetration among internet users of 91% (McKinsey & Company, 2019).

In 2018 digital advertising in Brazil grew by 42.9%. This growth is expected to slow down to 37.5% in 2019, 32.4% in 2020 and 20.4% in 2021. The total size of the market was US\$ 2.2bn in 2018, and is expected to grow to US\$ 3.1bn in 2019, US\$ 4.1bn in 2020 and US\$ 5.0 bn in 2021. (Statista, 2019). But there are other interesting markets for Whatsapp Automação as well. A huge application for the product is the e-commerce customer service market. The e-commerce segment grew by 13% p.a. from 2013 to 2017 from R\$ 28.8 billion to R\$ 47.7 billion and the number of buyers grew from 31.3 million to 55.1 million (McKinsey & Company, 2019).

The service Whatsapp Automação is offering, is not made for microenterprises, but potential customers are all small, medium and large companies, operating in the service and commerce sector. In 2016 there were 405.283 companies fitting this description and are potential clients for Whatsapp Automação, if their business includes stir customer communication (SEBRAE, 2018).

	Small	Medium and Large
Commerce	181.091	20.865
Service	171.878	31.449
Total	405.283	

Figure 6 Small, Medium and Large companies in Brazil in 2018 (SEBRAE, 2018)

5.2.3 Competitors

The market for WhatsApp automated services in Brazil is still under development, as the technology is based on WhatsApp Business API, which is only available since August 2018. First competitors have already entered the market with their solutions. There are 5 main competitors, who also entered the market recently. Those main competitors are whatslovers, mktzap, whatsclub, whatshub and LeadsZapp.

The state of the market is still under development, as most companies, similar to Whatsapp Automação, just entered the market recently, often with unfinished products. Therefore, no detailed information of the actual size of the market is available. But according to Expert 7, their main competitor is whatslovers, and *“whatslovers entered the market a couple of weeks ago with an unfinished product. They were not able to fulfil the customer needs and immediately lost their clients, who are now approaching us.”* The few competitors’ products that were tested online together with the founders of Whatsapp Automação, were similar to the product Whatsapp Automação is offering, but more limited in its functionalities. So, the main takeaways from the analysis of the competitors are that they are just evolving, like Whatsapp Automação and that the market for WhatsApp automated services is just developing.

5.3 Valuation Model Analysis

This section will summarize the findings from the application of modified valuation models on the case of Whatsapp Automação. Three valuation models were chosen. The scorecard method and the risk factor summation method were chosen as rule of thumb models and a modified

version of the Damodarans valuation model, as a representative of a DCF approach. All values are in Brazilian Real.

5.3.1 Scorecard Valuation Analysis

The first valuation model tested on Whatsapp Automação is the scorecard valuation method. The detailed results of the scorecard valuation are summarized in Appendix C. In the original scorecard valuation, the management team is the most important evaluation category for investors (cf. chapter 3.2.1). That this is also the case in Brazil was confirmed by Expert 1, who says that: *“The most important thing we look at is the team.”* And Expert 2 mentions that: *“The team is the most important factor in the analysis. We look at the motivation, the entrepreneurial capabilities and the team’s composition.”* So, the management team stayed the most important criteria, but several subitems were added to this evaluation category. To reflect the advantage a serial entrepreneur has in dealing with Brazilian regulations (cf. chapter 5.1.1) the subitem “Experience in founding a startup was added”. To reflect the importance of MCS (cf. chapter 3.4), this attribute was added as well. Expert 2 mentioned that: *“it is very much appreciated, if the startup has a financial expert or CFO.”* I also included this argument by adding the subitem “CFO present” and one criterion called “Passion and entrepreneurial drive” was included to support the importance of motivation and devotion (cf. chapter 3.1.3).

The values of characteristics in the second category, size of opportunity, were divided by the factor 9.43 to adapt the strength of the Brazilian economy, in comparison with the US economy, where the valuation model was developed. The factor 9.43 is the quotient of Brazils GDP and the GDP of the USA (Worldbank, 2019a). As Expert 1 states that: *“We are looking for attractive and growing markets.”*, the subitem “market prospects” was included in the modified approach. Also, Expert 4 amplified the importance and mentions that: *“We look at the trends and if the startups business idea is following those trends.”*

The category strength of the product and intellectual property was enriched by two additional subitems. The first one is “supportive trends” to add one important decisive criterion, as Expert 1 says that: *“the product must fit industry trends industry trends.”* Additionally, the scalability of the product also became a subitem. Expert 3 commented that: *“Investors are [...] particularly interested in scalable business models.”* And also, Expert 1 and Expert 4 mentioned the fundamental importance of the scalability of the business model.

In the category marketing and sales channels, the subitem “reputation among customers” was added to give the opportunity to reflect the impact of the eWOM (cf. chapter 3.5) and to address traction, as Expert 3 said that: *“Investors want to see traction.”*

The next category under revision is the competitive environment. To better reflect the market conditions, and in the case of Brazil the closeness of the market, (cf. chapter 5.1.6) the subitem “market entry barriers” was added. The second addition to this category was the subitem “treat of substitutes, inspired by Expert 1, who mentioned that: *“We [...] want companies whose product is highly differential from other products in the market”*

The category other factors includes the “need for additional funding” from the original approach and was extended by two other subitems. First, the “capability of dealing with legal/tax issues” was added to include a criterion reflecting the complexity of the Brazilian tax system (cf. chapter 5.1.1). Second, “dependency on highly-trained professionals” was included in the model to assess the capabilities and costs of future personnel (cf. chapter 5.1.3).

The results in each category were not compared with a comparable company, as the original model suggests. It was not possible to obtain the detailed information needed in order to conduct a sound assessment of a competitor. The input data needed for such a case was not available, as it is private information. The information for the case of Whatsapp Automação was retrieved through personal interviews and field research. To overcome this, the max. total score was limited to 1,00 and then compared with the four different average valuations for potential comparable companies.

The results of the comparison between the original scorecard model and the modified model are summarized below. For the detailed model see Appendix C.

Criteria	Score Original	Score Modified
Management Team (30%)	0,175	0,195
Size of Opportunity (25%)	0,25	0,25
Strength of the product and intellectual property (15%)	0,10	0,118
Marketing and Sales Channels (10%)	0,08	0,083
Competitive Environment (10%)	0,04	0,06
Other Factors (10%)	0,02	0,02
Total score (max. 1,00)	0,665	0,7262

Valuations		
Based on Projected valuation ad. startups	\$ 901.559,77	\$ 984.517,47
Based on Projected valuation of all startups	\$ 3.401.187,10	\$ 3.714.149,89
Based on Real valuation of all startups	\$ 3.326.371,76	\$ 3.632.450,37
Based on Projected valuation of small startups	\$ 2.372.536,98	\$ 2.590.847,76
Average over the 4 valuations	\$ 2.500.413,90	\$ 2.730.491,37

Figure 7 Scorecard Valuation Summary

The modified approach resulted in a higher scoring in four out of six categories and the value in two categories was identical. With a score of 0,7262 Whatsapp Automação scored 0,0612 points higher in the modified model, compared to the original model. This results in a financial variance of 8,4% between the two valuation models.

The advantage of the scorecard valuation is that it allows to include a variety of qualitative data. The model mainly relies on current information and characteristics of the startup and does not require to make an excess amount of assumptions. On the downside, the models' basis are subjective interpretations by the evaluator, which can lead to a variety of biases affecting the valuation process. Another weakness are the comparable companies. First, data about first round valuations of seed stage startups from a specific sector is rarely available and can often only be estimated. And second, startups differ fundamentally in their firm characteristics, like product and market. For a very specialized startup the list of potential comparable companies in the area becomes accordingly small.

5.3.2 Risk Factor Summation Analysis

The second valuation model applied on Whatsapp Automação is the risk factor summation model. The detailed results of the application of this method are presented in Appendix D. The original approach only assesses a risk based on one dimension and a whole number. This was changed to a risk assessment based on many subcategories for each risk. Then the average score of the subcategories was assessed to each risk. Additionally, to adapt this in the US established model to the Brazilian business environment the impact factor of each risk was replaced by the quotient of the average startup valuation in Brazil and the US. Data was retrieved from AngelList. The new impact factor is \$ 744.211,96 for each whole number deviation. For the comparison between the original approach and the modified approach, the results were rounded to the next whole number and inserted into the original approach.

During the interviews Expert 2 commented on the biggest risks for startups: *“The biggest risks for young startups are the technological risks and the product/market fit risk, so the technological approach on the product is important.”* This led to the inclusion of the product/market fit risk in the modified approach.

Expert 1 mentions risk analysis as well and says that: *“The most important risk factors are the team risk, the technology risk, the competition risk and the economic risk.”* In combination with the characteristics of the Brazilian economy and Brazilian politics the decision was made to also include the risk factor “economic risk” in the modified risk factor summation model.

Also, during the talk with expert 4 the startup risks were a discussion point and expert 4 stated that: *“The most important risk categories are the management risk, all risks associated with the product and its development and the capability risk, which means that the startup is unable to scale its business model.”* So, the capability risk was added to the model, even though one can argue that this risk is somewhat included in the management risk. But in combination with another point Expert 4 mentions, when he stated that: *“the target company should show dynamic capabilities and strategic management”* it seems worthy to include this risk in addition.

Based on the information given the management risk, the legislation risk, the technology risk, the competition risk and the product/market fit risk were categorized as critical risks and their impact on the valuation in the modified approach was doubled. The litigation risk and the international risk were not included because of the absence of information.

The results of the comparison between the original risk factor summation model and the modified model are summarized below. For the detailed model see Appendix D.

Risk	Original	Effect	Modified	Effect	Deviation
Management Risk	1	\$744.211,96	1,33	\$992.282,61	\$248.070,65
Stage of Business	1	\$744.211,96	1,00	\$744.211,96	\$-
Legislation/Political Risk	-1	\$-744.211,96	-1,50	\$-1.116.317,93	\$372.105,98
Manufacturing Risk	-1	\$-744.211,96	-0,67	\$-496.141,30	\$248.070,65
Sales and Marketing Risk	0	\$-	0,20	\$148.842,39	\$148.842,39
Funding and capital raising Risk	0	\$-	-0,33	\$-248.070,65	\$248.070,65
Competition Risk	-1	\$-744.211,96	-1,14	\$-850.527,95	\$106.315,99
Technology Risk	0	\$-	-0,67	\$-496.141,30	\$496.141,30
Litigation Risk	0	\$-	0,00	\$-	\$-
International Risk	0	\$-	0,00	\$-	\$-
Reputation Risk	-1	\$-744.211,96	-1,00	\$-744.211,96	\$-
Potential Lucrative Exit	0	\$-	0,00	\$-	\$-
Product/Market Fit Risk	0	\$-	2,00	\$1.488.423,91	\$1.488.423,91
Economic Risk	0	\$-	-0,50	\$-372.105,98	\$372.105,98
Capability Risk	0	\$-	0,00	\$-	\$-
Sum	-2	\$-1.488.423,91	-1,28	\$-949.756,21	\$538.667,70
Valuations	Original		Modified		
Projected valuation ad. startups	\$ -132.694,93		\$ 405.972,77		\$538.667,70
Projected valuation of all startups	\$ 3.626.143,15		\$ 4.164.810,85		\$538.667,70
Real valuation of all startups	\$ 3.513.638,89		\$ 4.052.306,59		\$538.667,70
Projected valuation of small startups	\$ 2.079.300,87		\$ 2.617.968,58		\$538.667,70
Average over the 4 valuations	\$ 2.271.596,99		\$ 2.810.264,70		\$538.667,70

Figure 8 Risk Factor Summation Summary

The original model achieved a score of -2, whereas the modified model scores -1,29. This means that the comparable companies' valuations must be reduced by \$R -1.488.423,90 or \$R -958.615,88.

Two effects of the changes in the modified approach can be observed. The increased accuracy of the modified approach leads to an inclusion of risks with low impact, like the sales and marketing risk and the technology risk. Second, the three newly added risks have only an impact on the valuation in the modified model.

Based on the applied valuation the risk factor summation model the advantage of including a wider assortment of different risks is demonstrated. Dependent on the case, some risks can be more influential than others or even left out of the valuation process. On the one hand the optimization regarding subcategories increases the accuracy and allows the evaluator to go deeper into the analysis. But on the other hand, it makes the model more complex. Other downsides of the model are, like the scorecard method, the high degree of subjectivity and the issue with reliable information about comparable companies.

5.3.3 Discounted Cashflow Analysis

The last applied valuation method on Whatsapp Automação is a modified model of Damodarans DCF valuation approach. The detailed results of this valuation practice can be found in Appendix E. During the interviews it turned out that the professionals do not trust traditional valuation approaches, like the DCF approach. Expert 1 states in this context that: *“From the point of an institutional investor the traditional valuation approaches, like the DCF analysis, give us the security for justifying our valuation on a profound financial analysis and we do it for a five-year period. But this analysis is influenced by many assumptions and qualitative evaluations. Personally, as investor I do not trust the valuations calculated by those methods.”* Expert 2 also commented on the use of DFC analysis and the resulting problems and stated: *“In the first years of FINEPs investments traditional valuation methods we’re not applicable, because of high betas and consequently high IRR rates around 80%. The funds supported by FINEP calculate with an investment period of 7-8 years this made it impossible to make a solid valuation with a required rate of 80% IRR.”* Also, Expert 4 talked about the DCF valuation approach and confirms Damodaran’s reservations (cf. chapter 3.3.1) about this method: *“Young companies that have low revenues and negative earnings are very difficult to evaluate with traditional valuation methods, like the DCF method.”* Although the DCF approach does not appear to be very reliable for seed stage startup valuations most interviewees confirm the use of the model. It is a possibility to provide a complex analysis and to better justify the final valuation. It was also reported that the DCF valuation approach is widely spread among investors (cf. chapter 3.3), therefore the inclusion seems reasonable.

First, a selection process was performed to select a DCF approach. The disadvantages of the Venture Capital Method were the single case scenario and the difficult estimation of a suitable multiple for the calculation of the terminal value. The Damodaran approach also relies on a single case, but no multiples are involved (cf. chapter 3.3). Therefore, the decision was made to use the three case scenarios, as an element from the First Chicago Method, as basis for a DCF valuation, estimate the FCFs for 5 years and calculate the terminal value on the basis of Damodaran's approach. (cf. chapter 3.3.1). The reason for the selection of the First Chicago model is that the model includes three different scenarios, which allow to work with lower discount rates, as the scenarios absorb a significant part of the risk. The traditional DCF approach absorbs all this risk through the discount rate.

In accordance with the information provided, the DCF calculations were conducted in R\$. A short summary of the results below, for the detailed model see Appendix D.

	Success	Sideway	Failure
Probability	30%	50%	20%
DCF 2019	- R\$ 82.854,42	- R\$ 107.935,11	- R\$ 160.622,49
DCF 2020	R\$ 68.346,04	- R\$ 20.438,93	- R\$ 128.546,67
DCF 2021	R\$ 806.382,98	R\$ 366.529,60	R\$ -
DCF 2022	R\$ 2.125.524,33	R\$ 728.675,48	R\$ -
DCF 2023	R\$ 3.021.825,35	R\$ 826.399,51	R\$ -
TV	R\$ 9.792.664,14	R\$ 2.678.067,69	R\$ -
Sum	R\$ 15.731.888,43	R\$ 4.471.298,23	-R\$ 289.169,15
Enterprise Valuation	R\$ 6.897.381,81		

Figure 9 Discounted Cashflow Approach Summary

A detailed description of the three scenarios, success, sideway and failure and the underlying assumptions of each scenario can be found in the Appendix E. The DCF analysis was, according to the information retrieved from the interviews and the literature review, based on a 5-year time horizon, as Expert 1 states: *“Usually we try to make five-year forecasts for a valuation”*. This is consistent with Damodaran's approach (cf. chapter 3.3.1). The inclusion of three different scenarios allowed to work with a lower discount rate as the risk was partly shuffled off to the probability of occurrence of each scenario (cf. chapter 3.3.3). For the first two years discount rates of 50% were chosen, for the third year 40%, for the last two years of the projection 30% and after that 25%. Those discount rates closely match up with the investors'

expectations of receiving a 10 times return on investment, as Expert 3 mentioned: *“An investor needs to make 10 times the investment as a gain.”* The final growth rate of 9.1% was set accordingly to the estimated growth rate of social media advertising in 2023 (Statista, 2019). Expert 1 commented on the generation of input data and said: *“We usually sit down with the entrepreneurs and go through the data and assumptions.”* The input information for the detailed cashflow analysis was retrieved accordingly, as I sat down with the entrepreneurs, examined and discussed their data and finally made the underlying assumptions for the valuation.

The DCF approach shows the great strength of having a detailed company valuation, which complies with the main theorems of corporate finance. The exact company valuation based on future cashflows conveys security and accuracy, as highlighted by Damodaran (cf. chapter 3.3.1). But, the experience from applying the DCF approach on a Brazilian startup revealed several difficulties. First, the DCF approach is very sensitive to the assumptions, especially the discount rate and the perpetual growth. Those assumptions are made with the best possible knowledge about the case, but the numerous assumptions necessary add up to high levels of uncertainty. Second, the terminal value comprises a large share of the enterprise value, in this case 83%.

5.3.4 Model Comparison and Evaluation

The analysis of Brazils regulatory framework showed that high costs on account of the complex bureaucracy and a complicated and onerous taxation system are serious issues for startups. The original scorecard method does not account sufficiently for those costs, so additional subcategories were added. The risk factor summation method included the risks partially, but the modification led to a higher impact on the final valuation. Looking at the state of R&D in Brazil, it can be concluded that the underdevelopment of corporate R&D activities can lead to a higher demand for technological solutions and a better market position for tech startups. This effect was added through various subcategories in the scorecard valuation and the risk factor summation model. Brazils indicators for the entrepreneurial capabilities showed a low level in this pillar, but this didn't allow to conclude on low entrepreneurial capabilities of the individual. Instead other soft factors like leadership and entrepreneurial spirit were identified to play an important role for investors. These were added to the scorecard model but could only be added partly to the risk factor summation model. The examination of the impact of Brazils culture on the valuation models led to an inclusion of passion, drive and risk-taking mentality as

subcategories in the scorecard model and the risk factor summation model. Although, those factors are difficult to evaluate, they are important for the valuation of a startup. The evaluation of the pillar access to finance showed the challenging state of VC in Brazil and the difficulties for entrepreneurs to secure funding. The risk factor summation method allowed to assess this in different subcategories of the funding risk, whereas in the scorecard model it was not applicable to include this factor. The analysis of the market conditions revealed Brazil's relative isolation from global markets and production chains. This results in market entry barriers for foreign competition and unfavourable market conditions for startups that are either relying on imports or exports. This led to a modification of the scorecard model and the risk factor summation model, as subcategories reflecting the market entry barriers were added accordingly in both categories.

But, also important to mention in this context is that the exploration of the Brazilian entrepreneurial environment not only led to the inclusion of more categories, it also influenced the assessment of very different categories and finally, the modification of the risk factor summation approach led to a more accurate valuation model, as the inclusion of decimal places became possible, resulting from the addition of various subcategories.

Regarding the DCF approach, it was not possible to include all six pillars of entrepreneurship directly and completely. The pillars were not added separately to the valuation model, but their characteristics influenced the calculation of the underlying assumptions. The effects of the unfavourable regulatory framework supported the high taxation rate and increased the administrative costs. The issues of R&D in Brazil were especially influential regarding the calculation of the market share and the potential revenues. The overall difficulties in terms of financial access resulted in higher discount rates. In the case of Whatsapp Automação the effects of the market conditions indicators were not that approachable but could in a different case scenario.

The situation was something different with the pillar of the entrepreneurial capabilities and the culture. When their indicators were applied to the context of startups, they always came down to the personal evaluation of the founder(s). In the case scenario this often resulted in the evaluation of various personal characteristics, experiences and capabilities. Their expression could not be directly included into the DCF model. Only to some extent, they influenced the overall business calculations and assumptions. But it is not possible to quantify this effect.

A summary of the valuations shows that the results of the scorecard method and the risk factor summation method resemble each other and that the result of the DCF approach is significantly higher.

	Scorecard Modified	Risk Factor Summation Modified	DCF Approach
Based on Projected valuation ad. startups	\$ 984.517,47	\$ 405.972,77	
Based on Projected valuation of all startups	\$ 3.714.149,89	\$ 4.164.810,85	
Based on Real valuation of all startups	\$ 3.632.450,37	\$ 4.052.306,59	
Based on Projected valuation of small startups	\$ 2.590.847,76	\$ 2.617.968,58	
Average	\$ 2.730.491,37	\$ 2.810.264,70	
DCF Approach			\$ 6.897.381,81

Figure 10 Valuation results summary

The results of the valuation of Whatsapp Automação show an interesting characteristic of seed stage valuations, which is the wide variation of the final valuation amounts. Within the scorecard valuation and the risk factor summation valuation the different valuations result mostly from the different comparisons groups and depend on which comparison group the evaluator finds more suitable. Also, it can be observed that if the valuation is based on a lower comparison valuation the risk factor summation method can result in larger deviations from the average than the scorecard valuation. But there is also a wide variation between the scorecard and the risk factor summation valuations and the DCF approach. That the valuations of investors can vary by a lot was already observed by Waldron and Hubbard (1991), who found that numerous financial experts valuations of one startup, conducted with exactly the same information, resulted in valuations ranging from USD 6 million up to USD 17.5 million.

6. Conclusions

The valuation of seed stage startups is a sensitive and delicate procedure due to the matter of fact that traditional enterprise valuations are only restrictedly or not even applicable. Furthermore, it has been shown that assumptions are difficult to make, due to their subjective nature. The following section shortly summarizes the findings in regard of the developed hypotheses and the research question.

H1: The characteristics of the underlying pillars of the indicators of entrepreneurship are relevant for the valuation of startups in Brazil.

It has been shown that the analysis of the entrepreneurial environment in Brazil revealed decisive factors startups in Brazil and that those factors are insufficiently included by some existent valuation practices. The impact of the inclusion of those factors was demonstrated in the application and the analysis of the three conducted valuations. The expert interviews also confirmed that the analysis of the entrepreneurial determinants is relevant for seed stage valuations. Therefore, the first hypothesis is supported by the research.

H2: The scorecard valuation method is suitable to evaluate the value of a seed stage startup in Brazil.

The interaction with the interviewed experts has shown that many of the original elements of the scorecard valuation approach are in fact important for investors. Additionally, it was possible to include further categories. The original method had its focus mostly on the internal capabilities of the startup, but the modified approach included also external influences. Nevertheless, the method is relying on the comparison with other startups. This is difficult, as the availability of information about other startups is often not given due to its private nature. This complicates this method and limits its reliability. So, the second hypothesis is partially supported.

H3: The risk factor summation method is suitable to evaluate the value of a seed stage startup in Brazil.

The risk factor summation method has shown its strengths in including the external risk factors, identified in the analysis of the Brazilian indicators of environment. It was also possible to weight some risk factors more than others, which has been shown in the modified risk factor summation approach. But, the identified important focus on the founder, his team and their capabilities was insufficiently included in this method. Also, the weakness of the necessity of a group of comparable seed stage startups could not be offset. Therefore, the third hypothesis is also only partially supported.

H4: The DCF valuation method is suitable to evaluate the value of a seed stage startup in Brazil.

The process of evaluating Whatsapp Automação with the modified DCF approach has shown that DCF approach has only limited usage for the valuation of a seed stage startup. This is the case, because the estimation of the assumptions is too speculative. The inclusion of three possible development scenarios helped to reduce some uncertainty but setting reliable

assumptions for a company's development with a not marketable product and uncertain business prospects regarding financing, operations and technology is in many cases impossible. As the DCF model is not favourable regarding the inclusion of personal characteristics of the founders, which are among the critical decisive criteria of investors, the DCF approach cannot be recommended for the valuation of seed stage startups. Therefore, the fourth hypothesis can be rejected.

RQ: Can existing startup-valuation models for seed stage startups be adapted to the entrepreneurial environment in Brazil and which differences and advantages show the models?

Finally, to get back to the main topic, the concluded answer to the research question can be answered with a yes. From the valuation methods under revision in the context of this dissertation, especially the scorecard approach and the risk factor summation approach have shown a great potential to better assess the value of an early stage startup in Brazil. The adaptation of the valuation methods has shown the flexibility to include additional relevant subcategories and risks, specifically factors of the entrepreneurial environment in Brazil.

6.1 Managerial Implications

From a practical perspective, different managerial implications can be derived. The scope of these implications' effects on the one hand the investors point of view and on the other hand the entrepreneurs' point of view in terms of the startups valuation.

The valuation models for seed stage startups are a delicate matter for investors. The research showed that the valuation methods for seed stage startups use different characteristics than traditional company valuation methods. Especially personal characteristics are highly important for investors. This shifts the focus of the valuation process more to the evaluation of interpersonal interaction, the entrepreneur's personality and other underlying soft factors. By better understanding the importance of those characteristics, investors can improve their accuracy in predicting success and value creation and ultimately improve their decision making regarding their investment decisions.

Also, managerial implications for founders of startups can be derived from this study. First, is an extensive summary of valuation methods used by investors provided. Then the further application and analysis of the valuation methods shows entrepreneurs, which parts of their business influence the valuation of their startup and which weight have the different criteria for investors. By keeping in mind, the structure of the scorecard method and the content of the risk

factor summation method, seed stage startups can improve their structure before talking to investors and therefore receive a better valuation.

Additionally, shows the analysis of the pillars of entrepreneurship Brazils situation regarding the support of entrepreneurship. The interviewees commented on these pillars and named problems that should be tackled. This can be a good starting point for policy recommendations and overall improvements. This can improve the entrepreneurial performance in Brazil, which can ultimately lead to economic growth, job creation and poverty reduction.

6.2 Academic Implications and Future Research

The goal of this thesis was to identify decisive factors and suitable valuation methods for seed stage tech startups in Brazil. The research leads to several academic implications and areas of follow-up research on the topic. This dissertation overall confirmed the omnipresent issue, that seed stage startup valuation is more an art than a science and that the scorecard method and the risk factor summation method can be practical tools for evaluating startups.

One point where future research can tie up is the ex-post validation of the influence of the indicators of entrepreneurship as decisive factors for the valuation process and how they can be linked to investors decisive criteria. For further clarification of this issue additional research about seed stage startup investments can be done by a quantitative study, analysing the impact on valuations of those factors. To my knowledge there is no such study especially focusing on Brazil and seed stage startups, so in addition to this thesis, future research could follow-up on wider exploring investors preferences and decision-making in Brazil.

Future research can also focus more on the entrepreneurs' side of the valuation process. It would be an interesting opportunity to explore the entrepreneurs' knowledge about those valuation models and if founders with the knowledge about valuation methods structure their business differently than founders without the knowledge. In this context it would be also interesting to explore if one group of founders is more successful than the other.

6.3 Limitations

While this study provides valuable insights into the valuation of seed stage startups in Brazil, it also shows some limitations.

First, the case study approach, with the application of the different valuation models is only based on one startup, Whatsapp Automação. This brings many company and case specific

variables into the context of the evaluation of the valuation models and shifts the focus on one specific company and industry.

Another limitation of this study are the comparable companies. As the valuation of a seed stage startup, strongly depends on private information it is difficult to assess the characteristics and the valuation of comparable companies, which is needed for the scorecard and the risk factor summation method. The small amount of startups from the same industry (N=5) does not represent a good set of comparable company. Especially as those companies differ fundamentally within each other. Here further knowledge regarding private information about comparable companies could have resulted in a better comparable group of startups.

It has not been possible to test, if the by this study estimated final financial valuations for Whatsapp Automação are close to reality. The startup is still in the process of closing an investment and talks with potential investors are ongoing. Furthermore, will the developed models of this study influence the startups' valuation, as they were delivered and presented to the founders of Whatsapp Automação, who will use the information during the investment negotiation with potential investors.

The dissertation is also limited by the selection of the interview partners. All interviewees were experts in their field, but a different set of interviewees may have yielded different results. The valuation of seed stage startups doesn't follow a specific playbook, so different interviewees could have contributed additional and/or different information.

7. List of References

- ABES. (2018). *Mercado Brasileiro de Software Panorama e Tendências*. Retrieved from http://central.abessoftware.com.br/Content/UploadedFiles/Arquivos/Dados%202011/af_abes_publicacao-mercado_2018_small.pdf
- Acs, Z. J., Autio, E., & Szerb, L. (2014). National systems of entrepreneurship: Measurement issues and policy implications. *Research Policy*, 43(3), 476–494.
- Acs, Z., Szerb, L., & Autio, E. (2017). The Global Entrepreneurship Index. In *Global Entrepreneurship and Development Index 2016* (pp. 19–38).
- Aggarwal, R., Gopal, R., Gupta, A., & Singh, H. (2012). Putting Money Where the Mouths Are: The Relation Between Venture Financing and Electronic Word-of-Mouth. *Information Systems Research*, 23(3-part-2), 976–992. <https://doi.org/10.1287/isre.1110.0402>
- Andrade, T., de Oliveira, M. E. N., & Verissimo, M. P. (2019). Brazil: Merger Control -The Antitrust Review of the Americas 2019 - GCR - Global Competition Review. Retrieved from <https://globalcompetitionreview.com/insight/the-antitrust-review-of-the-americas-2019/1173676/brazil-merger-control>
- Arruda, C., Nogueira, V. S., & Costa, V. (2013). The Brazilian entrepreneurial ecosystem of startups: An analysis of entrepreneurship determinants in Brazil as seen from the OECD pillars. *Journal of Entrepreneurship and Innovation Management*, 2(3), 17–57.
- Baeyens, K., Vanacker, T., & Manigart, S. (2006). Venture capitalists' selection process: the case of biotechnology proposals. *International Journal of Technology Management*, 34(1–2), 28–46.
- Barriball, K. L., & While, A. (1994). Collecting data using a semi-structured interview: a discussion paper. *Journal of Advanced Nursing-Institutional Subscription*, 19(2), 328–335.
- Beaton, N. J. (2010). *Valuing early stage and venture-backed companies* (Vol. 503). John Wiley & Sons.
- Blank, S. (2010, January 25). Steve Blank What's A Startup? First Principles. Retrieved from Steve Blank website: <https://steveblank.com/2010/01/25/whats-a-startup-first-principles/>
- Block, J. H., De Vries, G., Schumann, J. H., & Sandner, P. (2014). Trademarks and venture capital valuation. *Journal of Business Venturing*, 29(4), 525–542. <https://doi.org/10.1016/j.jbusvent.2013.07.006>
- Bose, S., & Thomas, K. (2007). Valuation of intellectual capital in knowledge-based firms: The need for new methods in a changing economic paradigm. *Management Decision*, 45(9), 1484–1496.
- Brealey, R., Myers, S., Allen, F., & Mohanty, P. (1988). *Principles of Corporate Finance*, 11e. McGraw-Hill Education.

- Canuto, O., Fleischhaker, C., & Schellekens, P. (2015). *The Curious Case of Brazil's Closedness to Trade*.
- Cao, J., & Hsu, P.-H. (2011). The informational role of patents in venture capital financing. *Available at SSRN 1678809*.
- Castrogiovanni, G. J. (1991). Environmental munificence; a theoretical assessment. *Academy of Management Review*, 16(3), 542–565.
- Chatterji, A. K. (2009). Spawned with a silver spoon? Entrepreneurial performance and innovation in the medical device industry. *Strategic Management Journal*, 30(2), 185–206. <https://doi.org/10.1002/smj.729>
- Chen, H., Gompers, P., Kovner, A., & Lerner, J. (2010). Buy local? The geography of venture capital. *Journal of Urban Economics*, 67(1), 90–102.
- Chua, T. (2018). *Latin America Entry Points - Startup Ecosystem - Brazil 2018*. Retrieved from https://www.latamstartups.org/assets/pdfs/BrazilStartupEcosystem_LatAmStartups.pdf
- Cohan, P., Kakabadse, A., Kossof, L., & Tulgan, B. (2013). *The Capstone Encyclopaedia of Business: The Most Up-To-Date and Accessible Guide to Business Ever*. John Wiley & Sons.
- Cornell University, INSEAD, & WIPO. (2018). *The Global Innovation Index 2018: Energizing the World with Innovation*. Ithaca, Fontainebleau, and Geneva.
- Cumming, D., & Dai, N. (2011). Fund size, limited attention and valuation of venture capital backed firms. *Journal of Empirical Finance*, 18(1), 2–15.
- da Motta, A. A. (2016). *The Complex Brazilian Tax System: An Approach to a Civil Law Country* (Vol. 3). New York.
- Damodaran, A. (2009). Valuing Young, Start-Up and Growth Companies: Estimation Issues and Valuation Challenges. *SSRN Electronic Journal*.
- Damodaran, A. (2010). *The dark side of valuation: valuing young, distressed and complex businesses* (2nd ed). Upper Saddle River, N.J: FT Press.
- Darke, P., Shanks, G., & Broadbent, M. (1998). Successfully completing case study research: combining rigour, relevance and pragmatism. *Information Systems Journal*, 8(4), 273–289.
- Davila, A., & Foster, G. (2005). Management Accounting Systems Adoption Decisions: Evidence and Performance Implications from Early-Stage/Startup Companies. *The Accounting Review*, 80(4), 1039–1068.
- Davila, A., Foster, G., & Jia, N. (2015). The valuation of management control systems in start-up companies: international field-based evidence. *European Accounting Review*, 24(2), 207–239.

- De Leó, E. D., & Guild, P. (2003). Using repertory grid to identify intangibles in business plans. *Venture Capital*, 5(2).
- Denis, D. J. (2004). Entrepreneurial finance: an overview of the issues and evidence. *Journal of Corporate Finance*, 10(2), 301–326.
- Dias, A. K. S. (2016). Tributos e Startups – Os desafios na gestão tributária de empresas inovadoras. Retrieved from Blog Ajorpeme website: <http://ajorpeme.com.br/blog/tributos-e-startups-os-desafios-na-gestao-tributaria-de-empresas-inovadoras/>
- Dittmann, I., Maug, E., & Kemper, J. (2004). How Fundamental are Fundamental Values? Valuation Methods and their Impact on the Performance of German Venture Capitalists. *European Financial Management*, 10(4), 609–638.
- Duchesneau, D. A., & Gartner, W. B. (1990). A profile of new venture success and failure in an emerging industry. *Journal of Business Venturing*, 5(5), 297–312.
- Elnathan, D., Gavius, I., & Hauser, S. (2010). An analysis of private versus public firm valuations and the contribution of financial experts. *The International Journal of Accounting*, 45(4), 387–412.
- Europartner. (2018). Startups in Brazil grow and attract investors from USA and Europe. Retrieved from Europartner website: <http://www.europartner.com.br/startups-in-brazil-grow-and-attract-investors-from-usa-and-europe/>
- Fernandes, A. (2018). Em 2019, Brasil será o país que mais tributa empresas - Economia. Retrieved from Estadão website: <https://economia.estadao.com.br/noticias/geral,em-2019-brasil-sera-o-pais-que-mais-tributa-empresas,70002662224>
- Fernandez, P. (2002). *Valuation methods and shareholder value creation*. San Diego: Academic Press.
- Finkelstein, S. (2001). Internet startups: so why can't they win? *Journal of Business Strategy*, 22(4), 16–21.
- Fullen, S. L. (2006). *How to Get the Financing for Your New Small Business: Innovative Solutions from the Experts Who Do It Every Day*. Atlantic Publishing Company.
- Gazeta do Povo. (2018). Número de estudantes estrangeiros no Brasil cresce 112% em oito anos. Retrieved from Gazeta do Povo website: <https://www.gazetadopovo.com.br/educacao/numero-de-estudantes-estrangeiros-no-brasil-cresce-112-em-oito-anos-dajqmw2rb77eau0b6yqlwdtfe/>
- GEM. (2017). *Global Entrepreneurship Monitor Empreendedorismo no Brasil: 2016\ Coordenação de Simara Maria de Souza Silveira Greco; diversos autores*. Curitiba: Instituto Brasileiro da Qualidade e Produtividade.
- Gerring, J. (2006). *Case Study Research: Principles and Practices*. 279.
- Gimmon, E., & Levie, J. (2010). Founder's human capital, external investment, and the survival of new high-technology ventures. *Research Policy*, 39(9), 1214–1226.

- Greenberg, G. (2013). Small Firms, Big Patents? Estimating Patent Value Using Data on Israeli Start-ups' Financing Rounds: Small Firms, Big Patents? *European Management Review*, 10(4), 183–196.
- Groh, A., Liechtenstein, H., Lieser, K., & Biesinger, M. (2018). *The Venture Capital and Private Equity Country Attractiveness Index 2018*. IESE Business School, available at <https://blog.iese.edu/vcpeindex/files>.
- Hering, T., Olbrich, M., & Steinrucke, M. (2006). Valuation of start-up internet companies. *International Journal of Technology Management*, 33(4), 406.
- Hill, B. E., & Power, D. (2001). *Inside Secrets to venture capital*. New York: John Wiley.
- Hisrich, R. D., & Jankowicz, A. D. (1990). Intuition in venture capital decisions: An exploratory study using a new technique. *Journal of Business Venturing*, 5(1), 49–62.
- Hyytinen, A., Pajarinen, M., & Rouvinen, P. (2015). Does innovativeness reduce startup survival rates? *Journal of Business Venturing*, 30(4), 564–581.
- Inspier, Spectra Investments, & ABVAP. (2018). *Performance of the private equity and venture capital industry in Brazil*. Retrieved from <https://www.abvcap.com.br/Download/Estudos/4075.pdf>
- Isenberg, D. (2011). Introducing the Entrepreneurship Ecosystem: Four Defining Characteristics. Retrieved from Forbes website: <https://www.forbes.com/sites/danisenberg/2011/05/25/introducing-the-entrepreneurship-ecosystem-four-defining-characteristics/>
- Leahy, J. (2018). Brazilian start-ups defy economic gloom with record fundraisings. Retrieved from Financial Times website: <https://www.ft.com/content/8742a6b2-7b18-11e8-bc55-50daf11b720d>
- Lehman, D. R., Chiu, C., & Schaller, M. (2004). Psychology and culture. *Annu. Rev. Psychol.*, 55, 689–714.
- Li, H. (2001). How does new venture strategy matter in the environment–performance relationship? *The Journal of High Technology Management Research*, 12(2), 183–204.
- Longhurst, R. (2003). Semi-structured interviews and focus groups. *Key Methods in Geography*, 3, 143–156.
- Lucas Jr., H. C. (1994). Marketing and technology strategy in a “medium-tech” startup. *Information & Management*, 27(4), 247–257.
- Macmillan, I. C., Siegel, R., & Narasimha, P. N. S. (1985). 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.

- McKinsey & Company. (2019). *Brazil Digital Report 1st Edition*. Retrieved from <https://www.brazilatsiliconvalley.com/brazil-digital-report>
- Melchior, L. (2019). So nutzen Firmen WhatsApp Business API - onlinepc.ch. Retrieved from ONLINE PC website: <https://www.onlinepc.ch/business/whatsapp/so-nutzen-firmen-whatsapp-business-api-1683969.html>
- Mills, R. (1998). How Do You Value a Start-up Company?--the Flotation of OrangeTM. *Long Range Planning*, 31(3), 446–454.
- Miloud, T., Aspelund, A., & Cabrol, M. (2012). Startup valuation by venture capitalists: an empirical study. *Venture Capital*, 14(2–3), 151–174.
- Mizne, D. (2019). Poverty, inequity and the potential of Brazil's public schools. Retrieved from Financial Times website: <https://www.ft.com/content/62dfe12a-32e9-11e9-bb0c-42459962a812>
- Moogk, D. R. (2012). Minimum Viable Product and the Importance of Experimentation in Technology Startups. *Technology Innovation Management Review*, 2(3). Retrieved from <http://timreview.ca/article/535>
- OECD. (2009). *Measuring Entrepreneurship - A Collection of indicators*.
- OECD. (2011). *List of indicators of entrepreneurial determinants*. Retrieved from <https://www.oecd.org/industry/business-stats/48130028.pdf>
- OECD. (2017). *The digital transformation*. Retrieved from <http://dx.doi.org/10.1787/9789264268821-en>
- OECD. (2018). *Education at a Glance 2018: OECD Indicators*. Retrieved from <http://dx.doi.org/10.1787/eag-2018-en>
- OECD. (2019). *Financing SMEs and Entrepreneurs 2019: an OECD Scoreboard*. Retrieved from <http://www.oecd.org/cfe/smes/Policy-Highlights-Scoreboard2019-Final-opt.pdf>
- Panizza, N. B. (2013). *A nova lei do Sistema Brasileiro de Defesa da Concorrência: principais alterações concernentes ao CADE*.
- Paul, S., Whittam, G., & Wyper, J. (2007). Towards a model of the business angel investment process. *Venture Capital*, 9(2), 107–125.
- Payne, B. (2006). *The Definitive Guide to Raising Money from Angels*. Bill Payne.
- Payne, B. (2011). Valuations 101: The Risk Factor Summation Method - Gust Blog. Retrieved from The Gust Blog website: <http://blog.gust.com/valuations-101-the-risk-factor-summation-method/>
- Payne, B. (2013). Methods for Valuation of Seed Stage Startup Companies. Retrieved from <https://www.angelcapitalassociation.org/blog/methods-for-valuation-of-seed-stage-startup-companies/>

- Pe'er, A., & Keil, T. (2013). Are all startups affected similarly by clusters? Agglomeration, competition, firm heterogeneity, and survival. *Journal of Business Venturing*, 28(3), 354–372.
- Portal Tributário. (2018). TRIBUTACAO DE SOFTWARE ISS OU ICMS. Retrieved from PortalTributário website: <http://www.portaltributario.com.br/artigos/isssoftware.htm>
- Prescott, R. (2018). Mais de 95% do mercado brasileiro de software é de empresas PMEs. Retrieved from ConvergenciaDigital website: <http://www.convergenciadigital.com.br/cgi/cgilua.exe/sys/start.htm?UserActiveTemplate=site&infoid=48732&sid=5>
- Qu, S. Q., & Dumay, J. (2011). The qualitative research interview. *Qualitative Research in Accounting & Management*, 8(3), 238–264.
- Romanelli, E. (1989). Environments and Strategies of Organization Start-up: Effects on Early Survival. *Administrative Science Quarterly*, 34(3), 369–387. <https://doi.org/10.2307/2393149>
- Sahlman, W. A., & Scherlis, D. R. (1987). *A Method For Valuing High-Risk, Long-Term Investments: The "Venture Capital Method" (Revised October 2009)*.
- Salamzadeh, A., & Kawamorita Kesim, H. (2015). Startup companies: life cycle and challenges. *4th International Conference on Employment, Education and Entrepreneurship (EEE), Belgrade, Serbia*.
- Schipani, A., & Bradshaw, T. (2018, January 3). Didi takeover of Brazil's 99 piles pressure on Uber. Retrieved from Financial Times website: <https://www.ft.com/content/693eb596-f0cd-11e7-b220-857e26d1aca4>
- Schumann, C. P. (2006). Improving certainty in valuation using the discounted cash flow method. *Valuation Strategies Magazine*, 9(10).
- SEBRAE. (2016). *Sobrevivência das Empresas no Brasil*. Retrieved from <http://www.sebrae.com.br/Sebrae/Portal%20Sebrae/Anexos/sobrevivencia-das-empresas-no-brasil-relatorio-2016.pdf>
- SEBRAE. (2018). *Anuario do Trabalho nos Pequenos Negócios*. Retrieved from <https://m.sebrae.com.br/Sebrae/Portal%20Sebrae/Anexos/Anu%C3%A1rio%20do%20Trabalho%20nos%20Pequenos%20Neg%C3%B3cios%202016%20VF.pdf>
- Sohl, J. E. (2007). 14 The organization of the informal venture capital market. *Handbook of Research on Venture Capital*, 1, 347.
- Startupbase. (2019). StartupBase - A Base de Dados do Ecosistema Brasileiro de Startups. Retrieved from <https://startupbase.abstartups.com.br/>
- Statista. (2019). Digital Advertising - Brazil | Statista Market Forecast. Retrieved from Statista website: <https://www.statista.com/outlook/216/115/digital-advertising/brazil>
- Sudek, R. (2006). Angel Investment Criteria. *Journal of Small Business Strategy*, 17(2), 89–104.

- Tellis, W. M. (1997). Introduction to case study. *The Qualitative Report*, 3(2), 1–14.
- Toledo, L. F., & Marques, J. (2018). Universidades federais têm menos de 1% de intercambistas estrangeiros - Educação. Retrieved from Estadão website: <https://educacao.estadao.com.br/noticias/geral,universidades-federais-tem-menos-de-1-de-intercambistas-estrangeiros,70002355154>
- Trichkova, R., & Kanaryan, N. (2015). Startups valuation: approaches and methods. *First Balkan Valuation Conference*. Presented at the Best Valuation Practices, Sofia, Bulgaria.
- Trigeorgis, L. (1995). *Real Options in Capital Investment: Models, Strategies, and Applications*. Greenwood Publishing Group.
- van de Schootbrugge, E., & Wong, K. M. (2013). Multi-Stage Valuation for Start-Up High Tech Projects and Companies. *Journal of Accounting and Finance*, 13(2), 12.
- van Gelderen, M., Thurik, R., & Bosma, N. (2005). Success and risk factors in the pre-startup phase. *Small Business Economics*, 24(4), 365–380.
- van Osnabrugge, M. (2000). A comparison of business angel and venture capitalist investment procedures: An agency theory-based analysis. *Venture Capital*, 2(2), 91–109.
- van Osnabrugge, M. S. (1998). *The financing of entrepreneurial firms in the UK: a comparison of business angel and venture capitalist investment procedures*. University of Oxford.
- Vernimmen, P., Quiry, P., Dallochio, M., Le Fur, Y., & Salvi, A. (2014). *Corporate finance: theory and practice*. John Wiley & Sons.
- Viswanathan, B. (2018). When Is A Startup No Longer A Startup? Retrieved from Forbes website: <https://www.forbes.com/sites/quora/2018/04/24/when-is-a-startup-no-longer-a-startup/>
- von Gelderen, M., Frese, M., & Thurik, R. (2000). Strategies, uncertainty and performance of small business startups. *Small Business Economics*, 15(3), 165–181.
- Waldron, D., & Hubbard, C. M. (1991). Valuation Methods and Estimates in Relationship to Investing versus Consulting. *Entrepreneurship Theory and Practice*, 16(1), 43–52.
- WEF. (2014). *The Global Competitiveness Report 2014-2015*. Retrieved from http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014-15.pdf
- WEF. (2018). *The Global Competitiveness Report 2018*. Retrieved from <http://www3.weforum.org/docs/GCR2018/05FullReport/TheGlobalCompetitivenessReport2018.pdf>
- Woodside, A. G. (2010). *Case study research: theory, methods and practice* (1. ed). Bingley: Emerald.

- World Bank. (2017). *Doing Business 2017 - Equal opportunity for all*. Washington DC: World Bank.
- World Bank. (2019). *Doing Business 2019 - Training for Reform*. Washington DC: World Bank.
- Worldbank. (2019a). GDP (current US\$) | Data. Retrieved May 3, 2019, from GDP (current US\$) website: <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?view=chart>
- Worldbank. (2019b). GDP growth (annual %) | Data. Retrieved April 12, 2019, from <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=BR>
- Yin, R. K. (2014). Case study research: design and methods 5th ed. *Thousand Oaks*.
- York Angel Investors (Ed.). (2015). *Valuation of Angel Deals*. 28.
- Zainal, Z. (2007). Case study as a research method. *Jurnal Kemanusiaan*, 5(1).
- Zhou, H., Sandner, P. G., Martinelli, S. L., & Block, J. H. (2016). Patents, trademarks, and their complementarity in venture capital funding. *Technovation*, 47, 14–22.
- Zuniga, P., De Negri, F., Dutz, M. A., Pilat, D., & Rauen, A. (2016). *Conditions for innovation in Brazil: a review of key issues and policy challenges*.

APPENDIX

APPENDIX A: Interview Guide

Interview format: Semi-Structured

- 1) Beginning:
 - a. Thanking for the time
 - b. Presenting myself and the research project
 - c. Presenting the outline and format of the interview
- 2) Personal interviewee questions:
 - a. What is your position?
 - b. How long do you have this position?
 - c. What are your responsibilities?
 - d. What is your industry experience and startup experience?

Questions Regarding the entrepreneurial ecosystem

- 3) Which are Brazilian particularities that influence entrepreneurship and the startup valuation?
- 4) What do you think about the _____ in Brazil and which implications can you make regarding a startups value?
 - a. Regulatory Framework
 - b. R&D and Technology
 - c. Entrepreneurial Capabilities
 - d. Culture
 - e. Access to Finance
 - f. Market Conditions

Questions regarding startup valuation methods

- 5) Can you describe the valuation process for an seed stage startup?
- 6) What do you think about the usage of traditional valuation approaches for seed stage startup valuation?
- 7) What do you think about scorecard valuation models for seed stage startups? And their characteristics?

- a. Management Team
 - b. Size of Opportunity
 - c. Strength of the Product and Intellectual Property
 - d. Marketing and Sales Channels
 - e. Competitive Environment
 - f. Other Factors
- 8) What do you think about DCF analysis for the valuation of seed stage startups?

APPENDIX B: Interview Analysis – Key Statements

Appendix – Interview Analysis

Characteristic	Interviewee	Quote
Entrepreneurial Environment		
Regulatory Framework	Expert 1	<i>“The regulations are strict and the costs for the bureaucracy are high. The government has a lot of support programs on the state level through BNDS and FINEP but lacks in support in the lower levels.”</i>
	Expert 1	<i>“The political stability here is less uncertain, which we have to consider. We also have a higher variation in the exchange rate. The monetary policy is also more uncertain, and we have higher levels of inflation than in the US. There is a constant need for having a close look at the economy.”</i>
	Expert 1	<i>“Difficult is the process to get the business run is way and we still experience a lack of capital and a lack of governmental support.”</i>
	Expert 1	<i>“The evaluation of the regulatory framework is very country specific and other factors in Brazil affect the valuation as well, also one reason why many assumptions from the traditional American valuation models don’t hold.”</i>
	Expert 1	<i>“Mayors don’t tend to see the positive impacts of entrepreneurship and innovation and don’t support it sufficiently”</i>
	Expert 2	<i>“Entrepreneurs those with a technical background and without experts of administration in their team face problems. But serial entrepreneurs know the process and have the necessary contacts to manage.”.</i>
	Expert 2	<i>“Start-up have the disadvantage, compared to big companies, that they have to build up all the necessary</i>

		<i>structures and relationships. This process is very costly and time consuming, must be considered in the business plan.”</i>
	Expert 3	<i>“The regulations are also very important. Here in Brazil the investor is much less protected by regulations compared to more mature markets, like the US and Canada.”</i>
	Expert 3	<i>“There were some changes in the last couple of months that improved the investors situation, but there is still room for improvement. Liberalization and the reduction of the bureaucracy are two things that hopefully will improve with the new government.”</i>
	Expert 4	<i>“So, external factors influencing the valuation of companies in those sectors raise attention. Of course, a business-friendly regulation, liberalization of the market and the training of the human capital are important, but most important we need to follow the market developments closely.”</i>
R&D and Technology	Expert 2	<i>“Rio, with its universities provides a good basis for research. The government is supporting this, by forcing companies to invest 1% of its revenue in R&D. One half goes to universities and other institutions, whereas the other half can be used for internal R&D.”</i>
	Expert 2	<i>“Rio de Janeiro has one of the best infrastructures for start-ups in the country. COPPE, PUC, military and state-owned technology parks and private technology parks are located here and can be supportive factors for startups. Often startups from those organisations get funding from FINEP.”</i>
	Expert 1	<i>“looking at IP protection”</i>

	Expert 4	<i>“Here in Brazil especially agrotech, healthtech and the software industry are interesting industries for venture capitalists.”</i>
Entrepreneurial Capabilities	Expert 1	<i>“There are things like passion, which the entrepreneur needs to show and an entrepreneurial spirit. The team must have one leader, who is able to execute and who is the driving force in the team.”</i>
	Expert 1	<i>“We value entrepreneurs who are exponential in their thinking. And from my opinion the best leaders can be identified as people who can make a change.”</i>
	Expert 1	<i>“Brazilians are also not as entrepreneurial driven as Americans.”</i>
	Expert 3	<i>“Students who go to public schools have no chance compared to students from private schools. There are also huge regional differences between the northeast and the southwest and children from rural areas still lack behind children from urban areas. Most Brazilian entrepreneurs I know received a good education.”</i>
	Expert 3	<i>“Somebody needs to form the team and keep an eye on the organization. The skills of the team members need complement each other.”</i>
	Expert 4	<i>“Dynamic capabilities are important traits of a target company and its founders.”</i>
Culture	Expert 1	<i>“It’s not common to say that you’re disagreeing with somebody. People tend to keep it for themselves and then still act how they think it’s best.”</i>
	Expert 1	<i>“Brazilians are also not as entrepreneurial driven as Americans.”</i>
	Expert 1	<i>“Many successful entrepreneurs in Brazil retire too early, as they stop acting as an entrepreneur and improving their business, after being financially sorted.”</i>

	Expert 1	<i>“Brazil is quite a machismo country, and this keeps woman from becoming an entrepreneur. There is only little inclusivity for women in entrepreneurial activity.”</i>
Access to Finance	Expert 5	<i>“First, I invested my own funds, but then I got to the point when I needed an investment there. It was difficult to secure equity investments, as the process is slow and bureaucratic.”</i>
	Expert 3	<i>“The number of investors is growing, but investors still need more support in learn how to invest in a startup. Brazil is receiving the mayor share of all venture capital investment. Up to 50% goes to Brazilian companies. But for many startups it is still difficult do get the initial investment.”</i>
	Expert 4	<i>“In general, the VC industry in Brazil is quite young, far behind the US, and more careful about high risks.”</i>
	Expert 3	<i>“It is difficult to receive investments. This is also an important point why FINEP is active, to provide more finance. But, also entrepreneurs who show up with just an idea, a not working prototype or no proven record of success shouldn’t be surprised by this.”</i>
Market Conditions	Expert 3	<i>“Brazil is one of the largest economies in the world and has over 200 million inhabitants, but this market is not developing fast enough. The high taxes on imports for example, impede companies to invest in more advanced technologies.”</i>
Scorecard Valuation Model		
Management Team	Expert 1	<i>“The most important thing we look at is the team.”</i>

	Expert 2	<i>“The team is the most important factor in the analysis. We look at the motivation, the entrepreneurial capabilities and the team’s composition.”</i>
	Expert 2	<i>“It is very much appreciated, if the startup has a financial expert or CFO.”</i>
Size of opportunity	Expert 1	<i>“We are looking for attractive and growing markets.”</i>
	Expert 4	<i>“We look at the trends and if the startups business idea is following those trends.”</i>
Strength of the product and intellectual property	Expert 1	<i>“The product must fit industry trends industry trends.”</i>
	Expert 3	<i>“Investors are also particularly interested in scalable business models, as it means that the business can be grown easily and usually reduces the amount of capital needed.”</i>
Marketing and Sales Channels	Expert 3	<i>“Investors want to see traction.”</i>
Competitive Environment	Expert 1	<i>“We also want companies whose product is highly differential from other products in the market.”</i>
Risk Factor Summation Method		
	Expert 2	<i>“The biggest risks for young start-ups are the technological risks and the product/market fit risk, so the technological approach on the product is important.”</i>
	Expert 1	<i>“So, we need to understand the technology in the product and analyse similar technologies and solutions on the market.”</i>

	Expert 1	<i>“The most important risk factors are the team risk, the technology risk, the competition risk and the economic risk.”</i>
	Expert 4	<i>“The most important risk categories are the management risk, all risks associated with the product and its development and the capability risk, which means that the startup is unable to scale its business model.”</i>
Discounted Cashflow Model		
	Expert 1	<i>“From the point of an institutional investor the traditional valuation approaches, like the DCF analysis, give us the security for justifying our valuation on a profound financial analysis and we do it for a five-year period. But this analysis is influenced by many assumptions and qualitative evaluations. Personally, as investor I do trust the valuations calculated by those methods.”</i>
	Expert 1	<i>“We usually sit down with the entrepreneurs and go through the data and assumptions.”</i>
	Expert 1	<i>“Then we also conduct a discounted cashflow analysis with these results.”</i>
	Expert 1	<i>“Usually we try to make five-year forecasts for a valuation”</i>
	Expert 1	<i>“We need to make sure that in an exit horizon of five years we are invested in a startup that operates in an interesting sector”</i>
	Expert 2	<i>“In the first years of FINEPs investments traditional valuation methods we’re not applicable, because of high betas and consequently high IRR rates around 80%. The funds supported by FINEP calculate with an investment period of 7-8 years this made it</i>

		<i>impossible to make a solid valuation with a required rate of 80% IRR.”</i>
	Expert 4	<i>“Young companies that have low revenues and negative earnings are very difficult to evaluate with traditional valuation methods, like the DCF method.”</i>
	Expert 3	<i>“An investor needs to make 10 times the investment as a gain.”</i>
Whatsapp Automação Competitors	Expert 6	<i>“Whatslovers entered the market a couple of weeks ago with an unfinished product. They were not able to fulfil the customer needs and immediately lost their clients, who are now approaching us”</i>

APPENDIX C: Scorecard Valuation

Yellow = Original Approach

Orange = Additions for the modified Approach

Management Team					Explanation/Justification - Whatsapp Automação
Characteristic	Expression	Possible points	WA	Score	
Experience	Many years of business experience	1		0	Founder 1: Carlos has already started a marketing startup before and is working in this area for about 8 years. Founder 2: Mauro has 30 years of experience in marketing services and IT he has also startup experience as he worked and founded a startup in the incubator of UFRJ.
	Experience in this business sector	2	x	2	
	Experience as CEO	3		0	
	Experience as CEO, CFO, CTO	2		0	
	Experience as product manager	1		0	
	Experience in sales or technology	-1		0	
	No business experience	-3		0	
Willingness to step aside for an experienced CEO	Unwilling	-3		0	As the issue of hiring an external CEO is not relevant at the moment it is difficult to assess this point. But the willingness of the first founder Carlos to take in an equal partner (Mauro) shows that the willingness to succeed is bigger than the ego.
	Neutral	0	x	0	
	Willing	3		0	

Is/are the founder/s coachable	Yes	3	x	3	Both founders show that they are willing to improve their knowledge. Also, the academic background indicates that they are coachable, and they constantly learn, develop and work with new technologies.
	No	-3		0	
How competent is the management team	Entrepreneur only	-1		0	The management team occupies some of the key positions (marketing manager, sales manager and developer), but some key positions are still vacant. Especially the role of an CFO with an overview about the finances is missing.
	One competent player in place	0		0	
	Team identified and on the sidelines	2	x	2	
	Competent team in place	3		0	
Experience in founding a startup	No	-1		0	The two founders Mauro and Carlos have already experience in founding a startup and worked in an entrepreneurship environment. Carlos was more successful than Mauro, his first founded company is still in business and generating profits. Nevertheless, these startups were not that successful that their engagement resulted in a successful exit or merger
	Work experience in entrepreneurship environment	1		0	
	Existing founding experience	2	x	2	
	Founding experience with successful exit or merger	3		0	
Existence of Management Control Systems	High degree	2		0	At the moment no Management Control Systems are in place. This refers especially to financial planning and management performance measurement systems.
	Medium degree	1		0	
	Low degree	0	x	0	

CFO present	Yes	1		0	The role of the CFO is especially important for a startup and even more after receiving an investment. Currently the startup has no CFO.
	No	0	x	0	
Passion, entrepreneurial drive and risk-taking behaviour	Low passion, no entrepreneurial drive	-3		0	The founders are engaged in this startup, because they saw the opportunity WhatsApps' technology is offering them. They are highly motivated and passionate. Invested a lot of free and personal time.
	Average passion, average entrepreneurial drive	-1		0	
	High passion, high entrepreneurial Drive	3	x	3	
Modified Approach					
Max. points possible		20		13	
Weighting	30%				
Relative Score				0,2	
Original Approach					
Max points possible		12		7	
Weighting	30%				
Relative Score				0,18	

Size of Opportunity					
Size of the Target Market	< R\$ 21.1 million	0		0	<p>The size of opportunity was calculated in a very conservative way. The Whatsapp Automações product targets the market of small especially targeting companies in the service sector and the commerce sector (405.283). The product might be interesting for 5% of all these companies, as a critical mass of their own costumers is needed to make sense of the product. Moreover, the average billing per company is calculated with R\$ 1000.</p> <p>This results in an opportunity of R\$ 243 million.</p>
	> R\$ 21.1 million < R\$ 42.2million	1		0	
	> R\$ 42.2 million	2	x	2	
Potential for revenue of target company in 5 years	< R\$ 8,42 million	0		0	<p>Assuming that Whatsapp Automação can capture a market share of only 5% within the next years, this would result in a revenue of more than R\$12 million per year.</p>
	> R\$ 8.42 million <R\$ 21,2 million	1	x	1	
	> R\$ 21.1 million (will require additional funding)	-1		0	
Market Prospects	Stagnant or declining market	-1		0	<p>The market of customer service and social media marketing are two different markets, but the product offered by Whatsapp Automação is bringing together two opportunities for companies to connect and improve their efforts in customer care and marketing</p>
	Growing Market	0		0	
	New developing Market	1	x	1	

Modified Approach				
Max. points possible		4		4
Weighting	25%			
Relative Score				0,25
Original Approach				
Max. points possible		3		3
Weighting	25%			
Relative Score				0,25

Strength of the Product and Intellectual Property					
Is the product defined and developed	Not well define, still looking at prototypes	-3		0	Whatsapp Automação has already a prototype product and is selling the product already. So far, the company is receiving good feedback. Nevertheless, more functions are in the pipeline and will be added to the product soon.
	Well defined prototype looks interesting	1		0	
	Good feedback from potential costumers	2		0	
	Orders or early sales from costumers	3	x	3	
Is the product compelling to costumers	The product is a vitamin pill	-3		0	This product is compelling to costumers, as it simplifies and automates the customer service. This has two main effects. First, a company can attend more costumers and second, it reduces the costs of the customer service. It also allows customers to open a new sales channel through WhatsApp.
	This product is a pain killer	2	x	2	
	This product is a pain killer with no side effects	3		0	
Can this product be duplicated by the others?	Easily copied, no intellectual property	-3		0	The product works with WhatsApp Business API. This platform is only opened since on year and allows companies to use WhatsApp for costumer communication. As the company does not own any IP rights and is strongly depended on the openness of WhatsApp business API, other companies can duplicate the product with the right technical knowledge. But, the duplication of all features and
	Duplication difficult	1	x	1	
	Product unique and protected by trade secrets	2		0	
	Solid patent protections	3		0	

					functions is time consuming and requires expert knowledge.
Supportive trends	No trends in supporting the product	-1		0	WhatsApp is becoming a much more valuable tool for companies, in order to newly arrange their social media advertising and customer support. In today's tech dominated world, customers want immediate answers and support instead of sending an email and waiting days for replies. This social trend is used by Whatsapp Automação.
	Little trends in supporting the product	1		0	
	Strong trends in supporting the product	2	x	2	
Scalable business model	Yes	-3		0	The products' automation allows the founders to scale the business model. After the implementation process Whatsapp Automação only provides the software and the ecosystem for the client's customer service to engage with their clients.
	No	3	x	3	
Modified Approach					
Max. points possible		14		11	
Weighting	15%				
Relative Score				0,12	

Original Approach				
Max. points possible		9		6
Weighting	15%			
Relative Score				0,1

Marketing and Sales Channels					
Sales channels and sales	Haven't even discussed sales channels	-3		0	<p>Whatsapp Automação has two main sales channels.</p> <p>The first one is the Appstore from a RD station in Floripa. Whatsapp Automação was promoted through the Appstore and this presence attracts costumers.</p> <p>The second sales channel are business and industry organisations. Whatsapp Automação is present in one business and industry organisation and receives costumers towards the attention other companies give to this service. Additionally, personal contacts of the two founders have been beneficial for the securing of several contracts.</p>
	Key beta testers identified and contacted	2	x	2	
	Channels secure, costumers placed trial orders	3		0	
Sales partners	No partners identified	-2		0	
	Key partners in place	2	x	2	

Reputation among customers	Bad reputation	-2		0	As the startup already has some clients and is connected to sales partners a notable reputation has emerged. The actual clients seem to be happy with the offered product and as the development of the product goes hand in hand clients feel appreciated. It is also reported that new clients approach Whatsapp Automação, because of others indications.
	No reputation so far	0		0	
	Good reputation	1	x	1	
Modified Approach					
Max. points possible		6		5	
Weighting	10%				
Relative Score				0,08	
Original Approach					
Max. points possible		5		4	
Weighting	10%				
Relative Score				0,08	

Competitive Environment					
Strength of competitors in this marketplace	Dominated by a single player	-2		0	WhatsApp Business API for enterprise communications is on the market since August 2018. This means that companies didn't have much time to establish themselves in the market. At the moment there exist only a few companies, like whatslovers and leadwhats, offering the same/similar services. And the players in the market are still relatively small.
	Dominated by several players	-1		0	
	Fractured, many small players	2	x	2	
Strength of competitive products	Competitive products are weak	3		0	Different competitive products exist in the market. After analysing the competitors profile some weaker products, but also some products with even characteristics have been identified.
	Competitive products are even	0	x	0	
	Competitive products are excellent	-2		0	
Market entry barriers	Low	-2		0	As the product is based on WhatsApp API other companies can use the same interface of WhatsApp API to develop a similar product. Nevertheless, a lot of programming work is needed to develop such a tool. But the Brazilian market is quite close for foreign companies, which reduced the competition.
	Medium	2	x	2	
	High	3		0	

Threat of Substitutes	High	-2		0	Substitutes would be other technological based products that offer social media marketing and customer communication on a technological base. This could be Facebook or Instagram, who have a similar coverage. Nevertheless, WhatsApp is the strongest communication platform in the region and has a great outlook.
	Medium	0		0	
	Low	2	x	2	
Original Approach					
Max. points possible		10		6	
Weighting	10%				
Relative Score				0,06	
Modified Approach					
Max. points possible		5		2	
Weighting	10%				
Relative Score				0,04	

Other Factors

Need for additional funding	None	3		0	If the product is successful more money could be needed to foster the development. This depends on the success of the new functionalities and the development costs, but a second angel round seems possible.
	Another Angel Round	0	x	0	
	Need venture Capital	-2		0	
Capability of dealing with legal/tax issues	No experience	-1		0	The company has access to a lawyer and an accountant who have great experience with these matters and know how to deal with startups and their legal issues in Brazil.
	Expert available	1	x	1	
Dependency on highly trained professionals	Very dependent	1		0	As one IT specialist is in the founder's team, he has access to IT specialists through his original company. Nevertheless, does the company need to hire IT specialists in the near future. The competition for them might affect the company's cost structure.
	To a medium extend dependent	0	x	0	
	Not dependent	-1		0	

Original Approach				
Max. points possible		3		0
Weighting	10%			
Relative Score				0
Modified Approach				
Max. points possible		5		1
Weighting	10%			
Relative Score				0,02

Modified Approach	
Summary	Relative Score
Management Team	0,1950
Size of Opportunity	0,2500
Strength of the product and intellectual property	0,1179
Marketing and Sales Channels	0,0833
Competitive Environment	0,0600
Other Factors	0,0200
Total relative score	0,7262

Original Approach	
Summary	Relative Score
Management Team	0,1750
Size of Opportunity	0,2500
Strength of the product and intellectual property	0,1000
Marketing and Sales Channels	0,0800
Competitive Environment	0,0400
Other Factors	0,0200
Total relative score	0,6650

APPENDIX D: Risk Factor Summation Valuation

Risk Factor Summation Method

Assessment			
1. Management Risk			Definition: The risk that the management makes poor decisions, which are going against overall shareholder interests.
Loosing key players	Positive	1	The sub risk that the management could lose some of its key players is positive. There is a huge commitment and identification within the team. Tis also contributes significantly to the risk of possible dysfunctionalities within the team and its motivation, which also can be assessed positively. The talent development within the team is rated neutral, as it seems to be average and no special development opportunities could be identified.
Disfunction of the current management and motivation	Positive	1	
Talent development within the team	Neutral	0	
Average		0,67	
2. Stage of Business			Definition: Assesses the status quo of the company and evaluates how much riskier it is to move forward. The quality of the business concept is evaluated positive, as the business concept aims to fill a special niche in the market, is well planned and so far, executed as well. This concept was developed in strong interaction with customers to exactly fit the market needs. As the product has already been tested and first customers are using it the product readiness can also be assessed positive.
Quality of the business concept	Positive	1	
Design fit to the market	Positive	1	
Product readiness	Positive	1	
Average		1	
3. Legislation/Political Risk			Definition: Risk of harming/beneficial regulations and of the harming/beneficial political changes, instability.
Stronger WhatsApp regulations	Negative	-1	
Taxes	Negative	-1	

Tighter labour regulation	Neutral	0	As the product relies on WhatsApp, the risk of a tighter regulation WhatsApp itself can negatively affect Whatsapp Automação. Especially since the last elections in Brazil authorities are not happy with WhatsApp's influence. Therefore, the risk of stronger WhatsApp regulations in Brazil is assessed negative. Also, is the monetary situation of Brazil tense. This contains the risk of a higher fiscal burdens for companies. The risk of tighter labour regulations is neutral for Whatsapp Automação, as the company doesn't need many employees and existing regulations are already unfavourable, which makes a future deterioration improbable.
Macro-level political risk	Negative	-1	
Average		-0,75	

4. Manufacturing Risk

Definition: Risks affecting the manufacturing process of the product.

Breakdown of specifications	Negative	-1	The manufacturing process in this case is the software development. Here a possible breakdown of single features of the product is assessed negatively. This means that specific requirements for functionalities cannot be fulfilled by the development. The risk of compromises of the design due to technical requirements was evaluated neutral. Some compromises will be necessary to fulfil customers' expectations, but no major changes are expected to interrupt the development process. Technical limitations influence the manufacturing risk negatively. The reason for this is the technical basis of Whatsapp AIP, on which Whatsapp Automação is dependent upon.
Compromising on designs	Neutral	0	
Technical limitations	Negative	-1	
Average		-0,67	

5. Sales and Marketing Risk

Definition: Includes the potential for losses and failures of the marketing and the sales team.

Quality of the marketing strategy	Positive	1	The marketing strategy developed by the experienced founder Carlos, is assessed positive. His experience and the focus on specific sales channels is well planned and consistent. The demand for the product is evaluated very positively, as it is a new product for the marketing and first testing
Demand	Very positive	2	
Price War	Negative	-1	

Quality of sales personnel	Neutral	0	<p>resulted in high interests of potential clients. The category price war is influencing the risk negatively, as the high automation potential gives competitors the possibility to scale fast and reduce the price fast. The quality of sales personnel is neutral. Certainly, the only sales personnel is the founder, fast more employees will be needed and the assurance of their quality is critical. Missing opportunities are marked out as negative. This is due to the fact that the development process is still ongoing even though the demand is already existent.</p>
Missing opportunities	Negative	-1	
Average		0,2	
6. Funding/Capital raising Risk			Definition: Risk of not being funded or losses due to higher funding costs than expected.
Risk of delays in the funding process	neutral	0	<p>The risk of delays if the funding process and the risk of not finding an investor are neutral. This is the case, because on the one hand, first talks with potential investors have been taking place and strong interest was detected, but on the other hand the ongoing changes and uncertain developments noted during the valuation process. The risk of high funding costs is negative, because the negotiation position of Whatsapp Automação is not the strongest. Moreover is the economic environment implying a higher risk compensation.</p>
Risk of not finding an investor	neutral	0	
Risk of high funding costs	negative	-1	
Average		-0,33	
7. Competition Risk			Definition: The risk and of actions, executed by a competitor that negatively impact the business
Risk of competitors entering the market fast	very negative	-2	<p>The risk of competitors entering the market fast is very present and therefore strongly negative. First competitors are already in the market and promoting their services. The sub risk of innovation is negative, as the competitors are also constantly pushing new innovation into the market. The risk that the competitors take the fist targets is neutral, of course the competitors will take some, but that</p>
Risk of innovation	negative	-1	
Risk that competitors take first targets	neutral	0	
Risk that competitors win over price	neutral	0	

Risk that competitors take distribution partners	negative	-1	will not be a big problem for Whatsapp Automação, with their existing pre-interests and exclusive distribution. That the competitors win over the price is evaluated negatively. There is some evidence for price competition, but Whatsapp Automação is in a good position to keep up with this.
Risk that competitor secure IP protection	negative	-1	The risk that a competitor secures IP protection is evaluated negatively, there are no intentions to do so at Whatsapp Automação, but they also don't see the possibility. Competitors might take different approaches in regard of IP protection if it is possible. The risk of foreign competition is assessed positive. On the one hand it is easier to enter the Brazilian market with a technological product than a physical product, but the market is not anywhere soon to be flooded with a foreign product.
Risk of foreign competition	positive	1	
Average		-0,57	

8. Technology Risk

Definition: The risk for technological failures that can disrupt the business.

Failures of the Whatsapp automação system	neutral	0	The first sub risk regarding technological failures of the system is evaluated neutral, as some difficulties can always be expected, but the underlying technology should be supportive for the business model. The potential partnership with WhatsApp API is evaluated negatively, as Whatsapp Automação still has no official partnership agreement, but is able to work on an open source environment, but of course there is the risk that WhatsApp closes its environment. Another risk is that the technology not ready for expansion. This can be responded negatively in the case of WhatsApp due to the widespread of the technology in Brazil. The procurement situation of complementary services is negative, because no other technologies have yet been integrated into Whatsapp Automação ecosystem. The integration risk is evaluated negatively, as each solution must fit the customers environment there is a risk of integration failure. Another sub risk is the transactions processing risk, which refers to the undertaken financial transactions with the product
Partnership with WhatsApp API	negative	-1	
Technology not ready for expansion	positive	1	
Procurement of complementary services	negative	-1	
Integration risk	negative	-1	
Transactions processing risk	neutral	0	
Average		- 0,33	

and the payment procedures. As this procedure is quite standardized, but still not implemented, this risk is so far evaluated neutral

9. Litigation Risk

No information
available

0

Average

0

Definition: Risk that the company faces legal consequences.

There is so far not enough information available to assess this risk.

10. International Risk

No assessable
information

0

Average

0

Risk accruing from international business operations.

There is so far not enough information available to assess this risk, as Whatsapp Automação so far has no intention to expand its operations outside of Brazil.

11. Reputational Risk

Negative customer
reviews negative

-1

Clients actions
damaging the firm's
reputation negative

-1

Negative reputation of
WhatsApp affecting the
firm negative

-1

Definition Risk of losses of financial capital, social capital and/or market share caused by a damaged company's reputation.

The reputational risk is in all three subcategories assessed negatively. The risk of negative customer reviews is present. When introducing a new product with a new and unexperienced client base the risk for negative reviews is especially high. This goes hand in hand with the second category. After the integration and an introduction into the products functionalities the customer is up to usage of the product. All operating errors by the customer might be blamed on Whatsapp Automação. Also, the reputation of WhatsApp itself can be highly damaging for Whatsapp Automação. For example the questionable treatment of users' personal data by WhatsApp can damage Whatsapp Automações reputation. The same holds for other corporate scandals.

Average

-1

12. Potential Lucrative Exit

Attractiveness of the industry sector positive
Founders willingness to sell negative

Definition: Assesses the exit oportunities for the investor

1 The risk of a potential lucrative exit is neutral in total. The first sub risk is the attractiveness of the industry sector, as unattractive risks are not attracting much money, this can be decisive for a future exit. As the software industry at the moment is very attractive and is expected to grow constantly over the next years the attractiveness is evaluated positively. On the other hand, the founders willingness to sell further shares of the company is influential as well. From the current point of view the willingness to sell additional stocks is low, this complicates the potential involvement of another investor, who maybe wants to own the majority.

Average **0**

13. Product/Market Fit Risk

Customer reviews positive
Demand prior to the launch positive

Definition: Risk of not being in a good market with a product that can satisfy that market.

1 The product/market fit was assessed through two categories. On the one hand the customer reviews and on the other hand the demand prior to the launch. First, the response of current customers was very positive. Most clients stayed with the product and are now waiting for additional functionalities. Second, the current demand for the product shows that the product is fitting the market needs. At the moment the demand is higher as the founder's capabilities of handling all the requests.

Average **1**

14. Economic Risk

Affected by economic volatility negative
Inflation outlook neutral

Definition: Risk of economic developments affecting the company.

-1 The economic outlook and the vulnerability due to economic slowdowns is assessed negative. The reason for that is that during a recession most companies cut their costs and put additional investments on hold. This can affect more experimental services like Whatsapp Automação

Average **-0,5**

tremendously. Second influential risk is the inflation outlook. This risk is not affecting the business significantly to the one or another side. Also, as the outlook is stable this risk is assessed neutral.

15. Capability Risk

Capabilities of the founders	positive	1
Capability of others	negative	-1
Capability of the enterprise	neutral	0
Average		0

Definition: Risk that the startup doesn't have the capabilities to scale the business model.

Here, the risk of the capabilities is assessed on three levels. First the level of the founders being able to manage themselves and that they have the capabilities of being successful. This risk is assessed positive, they are good, but still not exceptional. Second the capabilities of other people in the company is assessed and evaluated negatively as not many specialists are hired and secured. Third the dynamic capabilities of the company as a whole are reviewed, and they are assessed neutral, as it can be on the one hand a very agile company and on the other hand a risk of a slowdown due to insufficient structures is still present.

APPENDIX E: Discounted Cashflow Valuation

The DCF analysis was conducted with three possible development scenarios for Whatsapp Automação. Some financial data was provided by the founders, other data was retrieved from Whatsapp Automações office in Rio de Janeiro. In accordance with the three scenarios the assumptions were made and, in some cases, checked with the entrepreneurs.

Success Scenario (30% probability): The success scenario presents the best-case scenario for the future development of Whatsapp Automação. In this scenario Whatsapp Automação accomplishes a fast and strong entry in the market within the year 2019. Two investments of each R\$ 100.000 are necessary in 2019 and 2020 for product development purposes. But the company is already planning with 112 clients at the end of 2020. The main revenue will come from WhatsApp POC in the first three years, only after that WhatsApp Marketing and the integration factory will start to deliver stronger constant revenues. Whatsapp Automação is also able to increase the revenue per client, especially from 2021 onwards, when new functions are fully operational. This goes hand in hand with a reduction of the overall costs, but the costs of WhatsApp Marketing and the integration factor are fixed with 60ct and 50ct per \$R revenue. In the success scenario the other expenses, like infrastructure, marketing and salaries are growing, but moderately. The selling expenses per unit are fixed at R\$ 400 per unit.

Sideways Scenario (50% probability): The sideways scenario is the most likely case scenario for the development of Whatsapp Automação. In this scenario Whatsapp Automação accomplishes a good market entry, which turns out to be a bit slower, due to technical problems with the product, than in the success case scenario. Also, the investment necessary in 2020 turns out to be R\$ 50.000 higher, in order to meet higher requirements. The assumptions indicate that the overall growth of Whatsapp Automação is slower in this scenario. Especially the WhatsApp Marketing and the Integration Factory only reach lower levels of performance and generate less revenue. Also, the costs cannot be reduced as fast as in the success scenario and other expenses, like the infrastructure, marketing and salaries increase faster. The selling expenses per unit are R\$ 200 higher than in the success scenario and the costs of WhatsApp marketing and the integration fabric are also higher per R\$ revenue.

Failure Scenario (20% probability): The third scenario taken into consideration is the failure scenario. This scenario assumes that Whatsapp Automação drops out of business after 2020. First, the investments needed to improve the product and to develop the additional functionalities is much higher than expected, with an investment of R\$ 150.000 necessary in the first year and R\$ 200.000 necessary in the second year. Second, the product is not viewed as positively as expected from the clients, so that Whatsapp Automação only has around 60 clients at the end of 2020. Furthermore, the costs for the infrastructure, the marketing and the overall salaries are much higher. This results in the closure of the business in 2020, as the equity holders are not willing to invest more capital and new equity investors cannot be acquired. Due to the occurred losses Whatsapp Automação has to close its operations finally.

Calculations Success Scenario:

Success Scenario - Operational Cashflow						Success Scenario Assumptions	
	2019	2020	2021	2022	2023		
Revenue	R\$ 141.750	R\$ 873.850	R\$ 4.887.000	R\$ 13.113.450	R\$ 24.728.220	Scenario Success: Client Factor 19/20	1
WhatsApp POC	R\$ 110.250	R\$ 829.450	R\$ 4.072.500	R\$ 9.366.750	R\$ 15.455.138	Revenue per client 2019	450
revenue per client		600	750	863	949	Revenue per client Jan-Jun 2020	550
#clientes		112	453	905	1358	Revenue per client Jul-Dec 2019	650
WhatsApp Marketing	R\$ 8.000	R\$ 14.400	R\$ 407.250	R\$ 2.810.025	R\$ 7.727.569	Marketing Factor 2019 Integration Factor 2021/2022	0,1
Fábrica de Integração	R\$ 23.500	R\$ 30.000	R\$ 407.250	R\$ 936.675	R\$ 1.545.514	Marketing Factor 2022	0,3
						Marketing Factor 2023	0,5
Costs	R\$ 81.800	R\$ 185.040	R\$ 1.034.415	R\$ 3.268.589	R\$ 6.997.084	Growth of clients 2021	150%
WhatsApp POC	R\$ 65.250	R\$ 161.400	R\$ 586.440	R\$ 1.114.236	R\$ 1.587.786	Growth of clients 2022	100%
medium costs	R\$ 250	R\$ 120	R\$ 108	R\$ 103	R\$ 97	Growth of clients 2023	50%
#clients		112	453	905	1358	Growth of average revenue per client 2021	25%
WhatsApp Marketing	R\$ 4.800	R\$ 8.640	R\$ 244.350	R\$ 1.686.015	R\$ 4.636.541	Growth of average revenue per client 2022	15%
Fábrica de Integração	R\$ 11.750	R\$ 15.000	R\$ 203.625	R\$ 468.338	R\$ 772.757	Growth of average revenue per client 2023	10%
						Cost Reduction 2021	10%
						Cost Reduction 2022	5%
Expenses	R\$ 68.520	R\$ 314.600	R\$ 499.987	R\$ 646.816	R\$ 731.399	Cost Reduction 2023	5%
Infrastructure	R\$ 4.940	R\$ 55.000	R\$ 71.500	R\$ 85.800	R\$ 94.380	Costs of Whatsapp Marketing per R\$ Sale	\$ 0,60
Marketing	R\$ 10.580	R\$ 43.800	R\$ 61.320	R\$ 79.716	R\$ 95.659	Costs of Fabrica de Integracao per R\$ Sale	\$ 0,50
Salaries	R\$ 53.000	R\$ 165.000	R\$ 231.000	R\$ 300.300	R\$ 360.360	Costs of Infrastructure Growth 2021	30%
Selling Expenses	R\$ 0	R\$ 50.800	R\$ 136.167	R\$ 181.000	R\$ 181.000	Costs of Infrastructure Growth 2022	20%
						Costs of Infrastructure Growth 2023	10%
Operational Cashflow	-R\$ 8.570	R\$ 374.210	R\$ 3.352.598	R\$ 9.198.046	R\$ 16.999.736	Costs of Marketing Growth 2021	40%
						Costs of Marketing Growth 2022	30%
						Costs of Marketing Growth 2023	20%
						Selling expenses per unit sold	\$ 400,00
						Salaries Growth 2021	40%
						Salaries Growth 2022	30%
						Salaries Growth 2023	20%

Success Scenario - Income Statement						
		2019	2020	2021	2022	2023
Name		Projection total in BRL	Projection total in BRL	Projection total in BRL	Projection total in BRL	Projection total in BRL
Revenues		R\$ 141.750,00	R\$ 873.850,00	R\$ 4.887.000,00	R\$ 13.113.450,00	R\$ 24.728.220,00
Increase or decrease in finished goods and work in process		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Other own work capitalized		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Other operating income		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Total operating profits		R\$ 141.750,00	R\$ 873.850,00	R\$ 4.887.000,00	R\$ 13.113.450,00	R\$ 24.728.220,00
Costs for consumables, supplies and goods purchased for resale		R\$ 81.800,00	R\$ 185.040,00	R\$ 1.034.415,00	R\$ 3.268.588,50	R\$ 6.997.084,43
Cost of purchased services						
Personnel costs		R\$ 53.000,00	R\$ 165.000,00	R\$ 231.000,00	R\$ 300.300,00	R\$ 360.360,00
Depreciation		R\$ 20.000,00	R\$ 20.000,00	R\$ -	R\$ -	R\$ -
other operating expenses		R\$ 15.520,00	R\$ 149.600,00	R\$ 268.986,67	R\$ 346.516,00	R\$ 371.039,20
Total operating expenses		R\$ 170.320,00	R\$ 519.640,00	R\$ 1.534.401,67	R\$ 3.915.404,50	R\$ 7.728.483,63
Operating income	+ = Surplus - = Deficit	-R\$ 28.570,00	R\$ 354.210,00	R\$ 3.352.598,33	R\$ 9.198.045,50	R\$ 16.999.736,38
Income from equity investments		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Income from other securities and from loans		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Other interest and similar income		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Depreciation of financial assets and of securities		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Interest and similar expenses		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Financial result	+ = Surplus - = Deficit	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Ordinary business activities	+ = Surplus - = Deficit	-R\$ 28.570,00	R\$ 354.210,00	R\$ 3.352.598,33	R\$ 9.198.045,50	R\$ 16.999.736,38
Extraordinary income		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Extraordinary expenses		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Extraordinary result	+ = Surplus - = Deficit	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Taxes		R\$ -	R\$ 120.431,40	R\$ 1.139.883,43	R\$ 3.127.335,47	R\$ 5.779.910,37
other taxes		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Net income/loss	+ = Surplus - = Deficit	-R\$ 28.570,00	R\$ 233.778,60	R\$ 2.212.714,90	R\$ 6.070.710,03	R\$ 11.219.826,01

DCF Valuation Success Scenario							
	2019	2020	2021	2022	2023	TV	Sum
Year	1	2	3	4	5		
Operating cash inflows							
+ Netsales	R\$ 141.750,00	R\$ 873.850,00	R\$ 4.887.000,00	R\$ 13.113.450,00	R\$ 24.728.220,00		
+ Other Income							
- Accounts receivable							
Net operating cash inflows	R\$ 141.750,00	R\$ 873.850,00	R\$ 4.887.000,00	R\$ 13.113.450,00	R\$ 24.728.220,00		
Operating cash outflows							
+ Cost of goods sold less depreciation	R\$ 81.800,00	R\$ 185.040,00	R\$ 1.034.415,00	R\$ 3.268.588,50	R\$ 6.997.084,43		
+ General and administrative expenses	R\$ 68.520,00	R\$ 263.800,00	R\$ 363.820,00	R\$ 465.816,00	R\$ 550.399,20		
+ Selling Expenses	R\$ -	R\$ 50.800,00	R\$ 136.166,67	R\$ 181.000,00	R\$ 181.000,00		
+ Taxes	R\$ -	R\$ 120.431,40	R\$ 1.139.883,43	R\$ 3.127.335,47	R\$ 5.779.910,37		
+ D Inventory	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ D Prepaid Expenses	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
- D Accounts Payable	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Total operating cash outflows	R\$ 150.320,00	R\$ 620.071,40	R\$ 2.674.285,10	R\$ 7.042.739,97	R\$ 13.508.393,99		
Net operating cash flow	-R\$ 8.570,00	R\$ 253.778,60	R\$ 2.212.714,90	R\$ 6.070.710,03	R\$ 11.219.826,01		
Priority Outflows							
+ Interest Expenses	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ Current Debt repayable	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ Lease payments	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Total Priority Outflows	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Discretionary Outflows							
+ Capital expenditures	R\$ 100.000,00	R\$ 100.000,00	R\$ -	R\$ -	R\$ -		
+ Research and Development expenses	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ Preferred stock dividends	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ Common stock dividends	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Total discretionary outflows	R\$ 100.000,00	R\$ 100.000,00	R\$ -	R\$ -	R\$ -		
Financial flows							
+ D Debt instruments (borrowings)	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ D Stock securities (equity)	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ D Term loans	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Total financial flows	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Net change in cash and marketable securities accounts							
+ Net operating cash flow	-R\$ 8.570,00	R\$ 253.778,60	R\$ 2.212.714,90	R\$ 6.070.710,03	R\$ 11.219.826,01		
- Priority outflows	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
- Discretionary outflows	-R\$ 100.000,00	-R\$ 100.000,00	R\$ -	R\$ -	R\$ -		
+ Financial flows	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Net change in cash and marketable securities accounts							
End-of-period cash balance	-R\$ 108.570,00	R\$ 153.778,60	R\$ 2.212.714,90	R\$ 6.070.710,03	R\$ 11.219.826,01		
Assumptions:							
Cost of Capital	50%	50%	40%	30%	30%	25%	
Growth after 2023						9,1%	
Discounted Value FCFF	-R\$ 82.854,42	R\$ 68.346,04	R\$ 806.382,98	R\$ 2.125.524,33	R\$ 3.021.825,35	R\$ 9.792.664,14	R\$ 15.731.888,43

Calculations Sideway Scenario:

Sideway Scenario - Operational Cashflow						Sideway Scenario - Assumptions	
	2019	2020	2021	2022	2023		
Revenue	R\$ 110.460	R\$ 654.160	R\$ 2.752.358	R\$ 5.298.290	R\$ 7.947.435	Scenario Sideway: Client Factor 19/20	0,8
WhatsApp POC	R\$ 78.960	R\$ 609.760	R\$ 2.293.632	R\$ 3.784.493	R\$ 4.967.147	Revenue per client 2019	400
revenue per client		550	660	726	762	Revenue per client Jan-Jun 2020	500
#clientes		90	290	434,4	543	Revenue per client Jul-Dec 2019	600
WhatsApp Marketing	R\$ 8.000	R\$ 14.400	R\$ 229.363	R\$ 1.135.348	R\$ 2.483.573	Marketing Factor 2019 Integration Factor 2021/2022	0,1
Fábrica de Integração	R\$ 23.500	R\$ 30.000	R\$ 229.363	R\$ 378.449	R\$ 496.715	Marketing Factor 2022	0,3
						Marketing Factor 2023	0,5
Costs	R\$ 83.375	R\$ 187.260	R\$ 718.324	R\$ 1.544.292	R\$ 2.597.841	Growth of clients 2021	100%
WhatsApp POC	R\$ 65.250	R\$ 161.400	R\$ 443.088	R\$ 598.169	R\$ 710.325	Growth of clients 2022	50%
medium costs	R\$ 250	R\$ 120	R\$ 102	R\$ 92	R\$ 87	Growth of clients 2023	25%
#clients		112	362	543	679	Growth of average revenue per client 2021	20%
WhatsApp Marketing	R\$ 5.200	R\$ 9.360	R\$ 149.086	R\$ 737.976	R\$ 1.614.323	Growth of average revenue per client 2022	10%
Fábrica de Integração	R\$ 12.925	R\$ 16.500	R\$ 126.150	R\$ 208.147	R\$ 273.193	Growth of average revenue per client 2023	5%
						Cost Reduction 2021	15%
Expenses	R\$ 68.520	R\$ 324.760	R\$ 510.160	R\$ 600.710	R\$ 700.558	Cost Reduction 2022	10%
Infrastructure	R\$ 4.940	R\$ 55.000	R\$ 77.000	R\$ 100.100	R\$ 125.125	Cost Reduction 2023	5%
Marketing	R\$ 10.580	R\$ 43.800	R\$ 65.700	R\$ 91.980	R\$ 124.173	Costs of Whatsapp Marketing per R\$ Sale	\$ 0,65
Salaries	R\$ 53.000	R\$ 165.000	R\$ 247.500	R\$ 321.750	R\$ 386.100	Costs of Fabrica de Integracao per R\$ Sale	\$ 0,55
Selling Expenses	R\$ 0	R\$ 60.960	R\$ 119.960	R\$ 86.880	R\$ 65.160	Costs of Infrastructure Growth 2021	40%
						Costs of Infrastructure Growth 2022	30%
Operational Cashflow	-R\$ 41.435	R\$ 142.140	R\$ 1.523.875	R\$ 3.153.288	R\$ 4.649.036	Costs of Infrastructure Growth 2023	25%
						Costs of Marketing Growth 2021	50%
						Costs of Marketing Growth 2022	40%
						Costs of Marketing Growth 2023	35%
						Selling expenses per unit sold	\$ 600,00
						Salaries Growth 2021	50%
						Salaries Growth 2022	30%
						Salaries Growth 2023	20%

Sideways Scenario - Income Statement		2019	2020	2021	2022	2023
Name		Projection total in BRL	Projection total in BRL	Projection total in BRL	Projection total in BRL	Projection total in BRL
Revenues		R\$ 110.460,00	R\$ 654.160,00	R\$ 2.752.358,40	R\$ 5.298.289,92	R\$ 7.947.434,88
Increase or decrease in finished goods and work in process		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Other own work capitalized		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Other operating income		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Total operating profits		R\$ 110.460,00	R\$ 654.160,00	R\$ 2.752.358,40	R\$ 5.298.289,92	R\$ 7.947.434,88
Costs for consumables, supplies and goods purchased for resale		R\$ 83.375,00	R\$ 187.260,00	R\$ 718.323,84	R\$ 1.544.292,00	R\$ 2.597.841,23
Cost of purchased services						
Personnel costs		R\$ 53.000,00	R\$ 165.000,00	R\$ 247.500,00	R\$ 321.750,00	R\$ 386.100,00
Depreciation		R\$ 20.000,00	R\$ 30.000,00	R\$ -	R\$ -	R\$ -
other operating expenses		R\$ 15.520,00	R\$ 159.760,00	R\$ 262.660,00	R\$ 278.960,00	R\$ 314.458,00
Total operating expenses		R\$ 171.895,00	R\$ 542.020,00	R\$ 1.228.483,84	R\$ 2.145.002,00	R\$ 3.298.399,23
Operating income	+ = Surplus - = Deficit	-R\$ 61.435,00	R\$ 112.140,00	R\$ 1.523.874,56	R\$ 3.153.287,92	R\$ 4.649.035,65
Income from equity investments		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Income from other securities and from loans		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Other interest and similar income		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Depreciation of financial assets and of securities		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Interest and similar expenses		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Financial result	+ = Surplus - = Deficit	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Ordinary business activities	+ = Surplus - = Deficit	-R\$ 61.435,00	R\$ 112.140,00	R\$ 1.523.874,56	R\$ 3.153.287,92	R\$ 4.649.035,65
Extraordinary income		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Extraordinary expenses		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Extraordinary result	+ = Surplus - = Deficit	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Taxes		R\$ -	R\$ 38.127,60	R\$ 518.117,35	R\$ 1.072.117,89	R\$ 1.580.672,12
other taxes		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Net income/loss	+ = Surplus - = Deficit	-R\$ 61.435,00	R\$ 74.012,40	R\$ 1.005.757,21	R\$ 2.081.170,03	R\$ 3.068.363,53

DCF Valuation Sideway Scenario							
	2019	2020	2021	2022	2023	TV	Sum
Year	0,67	2	3	4	5		
Operating cash inflows							
+ Netsales	R\$ 110.460,00	R\$ 654.160,00	R\$ 2.752.358,40	R\$ 5.298.289,92	R\$ 7.947.434,88		
+ Other Income							
- Accounts receivable							
Net operating cash inflows	R\$ 110.460,00	R\$ 654.160,00	R\$ 2.752.358,40	R\$ 5.298.289,92	R\$ 7.947.434,88		
Operating cash outflows							
+ Cost of goods sold less depreciation	R\$ 83.375,00	R\$ 187.260,00	R\$ 718.323,84	R\$ 1.544.292,00	R\$ 2.597.841,23		
+ General and administrative expenses	R\$ 68.520,00	R\$ 263.800,00	R\$ 390.200,00	R\$ 513.830,00	R\$ 635.398,00		
+ Selling Expenses	R\$ -	R\$ 60.960,00	R\$ 119.960,00	R\$ 86.880,00	R\$ 65.160,00		
+ Taxes	R\$ -	R\$ 38.127,60	R\$ 518.117,35	R\$ 1.072.117,89	R\$ 1.580.672,12		
+ D Inventory	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ D Prepaid Expenses	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
- D Accounts Payable	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Total operating cash outflows	R\$ 151.895,00	R\$ 550.147,60	R\$ 1.746.601,19	R\$ 3.217.119,89	R\$ 4.879.071,35		
Net operating cash flow	-R\$ 41.435,00	R\$ 104.012,40	R\$ 1.005.757,21	R\$ 2.081.170,03	R\$ 3.068.363,53		
Priority Outflows							
+ Interest Expenses	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ Current Debt repayable	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ Lease payments	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Total Priority Outflows	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Discretionary Outflows							
+ Capital expenditures	R\$ 100.000,00	R\$ 150.000,00	R\$ -	R\$ -	R\$ -		
+ Research and Development expenses	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ Preferred stock dividends	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ Common stock dividends	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Total discretionary outflows	R\$ 100.000,00	R\$ 150.000,00	R\$ -	R\$ -	R\$ -		
Financial flows							
+ D Debt instruments (borrowings)	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ D Stock securities (equity)	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ D Term loans	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Total financial flows	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Net change in cash and marketable securities accounts							
+ Net operating cash flow	-R\$ 41.435,00	R\$ 104.012,40	R\$ 1.005.757,21	R\$ 2.081.170,03	R\$ 3.068.363,53		
- Priority outflows	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
- Discretionary outflows	-R\$ 100.000,00	-R\$ 150.000,00	R\$ -	R\$ -	R\$ -		
+ Financial flows	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Net change in cash and marketable securities accounts							
End-of-period cash balance	-R\$ 141.435,00	-R\$ 45.987,60	R\$ 1.005.757,21	R\$ 2.081.170,03	R\$ 3.068.363,53		
Assumptions:							
Cost of Capital	50%	50%	40%	30%	30%	25%	
Growth after 2023						9,1%	
Discounted Value FCFF	-R\$ 107.935,11	-R\$ 20.438,93	R\$ 366.529,60	R\$ 728.675,48	R\$ 826.399,51	R\$ 2.678.067,69	R\$ 4.471.298,23

Calculations Failure Scenario:

Failure Scenario - Operational Cashflow						Failure Scenario - Assumptions	
	2019	2020	2021	2022	2023		
Revenue	R\$ 91.420	R\$ 407.550	R\$ 0	R\$ 0	R\$ 0		
WhatsApp POC	R\$ 59.920	R\$ 363.150	R\$ 0	R\$ 0	R\$ 0	Scenario Success: Client Factor 19/20	0,6
revenue per client		450	0	0	0	Revenue per client 2019	400
#clientes		67	0	0	0	Revenue per client Jan-Jun 2020	450
WhatsApp Marketing	R\$ 8.000	R\$ 14.400	R\$ 0	R\$ 0	R\$ 0	Revenue per client Jul-Dec 2019	450
Fábrica de Integração	R\$ 23.500	R\$ 30.000	R\$ 0	R\$ 0	R\$ 0		0
							0
Costs	R\$ 83.375	R\$ 187.260	R\$ 0	R\$ 0	R\$ 0		0
WhatsApp POC	R\$ 65.250	R\$ 161.400	R\$ 0	R\$ 0	R\$ 0	Growth of clients 2021	0%
medium costs	R\$ 250	R\$ 120	R\$ 120	R\$ 120	R\$ 120	Growth of clients 2022	0%
#clients		112	0	0	0	Growth of clients 2023	0%
WhatsApp Marketing	R\$ 5.200	R\$ 9.360	R\$ 0	R\$ 0	R\$ 0	Growth of average revenue per client 2021	0%
Fábrica de Integração	R\$ 12.925	R\$ 16.500	R\$ 0	R\$ 0	R\$ 0	Growth of average revenue per client 2022	0%
						Growth of average revenue per client 2023	0%
Expenses	R\$ 68.520	R\$ 309.520	R\$ 0	R\$ 0	R\$ 0	Cost Reduction 2021	0%
Infrastructure	R\$ 4.940	R\$ 55.000	R\$ 0	R\$ 0	R\$ 0	Cost Reduction 2022	0%
Marketing	R\$ 10.580	R\$ 43.800	R\$ 0	R\$ 0	R\$ 0	Cost Reduction 2023	0%
Salaries	R\$ 53.000	R\$ 165.000	R\$ 0	R\$ 0	R\$ 0	Costs of Whatsapp Marketing per R\$ Sale	\$ 0,65
Selling Expenses	R\$ 0	R\$ 45.720	R\$ 0	R\$ 0	R\$ 0	Costs of Fabrica de Integracao per R\$ Sale	\$ 0,55
						Costs of Infrastructure Growth 2021	0%
Operational Cashflow	-R\$ 60.475	-R\$ 89.230	R\$ 0	R\$ 0	R\$ 0	Costs of Infrastructure Growth 2022	0%
						Costs of Infrastructure Growth 2023	0%
						Costs of Marketing Growth 2021	0%
						Costs of Marketing Growth 2022	0%
						Costs of Marketing Growth 2023	0%
						Selling expenses per unit sold	\$ 600,00
						Salaries Growth 2021	0%
						Salaries Growth 2022	0%
						Salaries Growth 2023	0%

Failure Scenario - Income Statement		2019	2020	2021	2022	2023
Name		Projection total in BRL	Projection total in BRL	Projection total in BRL	Projection total in BRL	Projection total in BRL
Revenues		R\$ 91.420,00	R\$ 407.550,00	R\$ -	R\$ -	R\$ -
Increase or decrease in finished goods and work in process		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Other own work capitalized		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Other operating income		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Total operating profits		R\$ 91.420,00	R\$ 407.550,00	R\$ -	R\$ -	R\$ -
Costs for consumables, supplies and goods purchased for resale		R\$ 83.375,00	R\$ 187.260,00	R\$ -	R\$ -	R\$ -
Cost of purchased services						
Personnel costs		R\$ 53.000,00	R\$ 165.000,00	R\$ -	R\$ -	R\$ -
Depreciation		R\$ 30.000,00	R\$ 40.000,00	R\$ -	R\$ -	R\$ -
other operating expenses		R\$ 4.300,00	R\$ 15.520,00	R\$ -	R\$ -	R\$ -
Total operating expenses		R\$ 170.675,00	R\$ 407.780,00	R\$ -	R\$ -	R\$ -
Operating income	+ = Surplus - = Deficit	-R\$ 79.255,00	-R\$ 230,00	R\$ -	R\$ -	R\$ -
Income from equity investments		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Income from other securities and from loans		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Other interest and similar income		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Depreciation of financial assets and of securities		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Interest and similar expenses		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Financial result	+ = Surplus - = Deficit	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Ordinary business activities	+ = Surplus - = Deficit	-R\$ 79.255,00	-R\$ 230,00	R\$ -	R\$ -	R\$ -
Extraordinary income		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Extraordinary expenses		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Extraordinary result	+ = Surplus - = Deficit	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Taxes		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
other taxes		R\$ -	R\$ -	R\$ -	R\$ -	R\$ -
Net income/loss	+ = Surplus - = Deficit	-R\$ 79.255,00	-R\$ 230,00	R\$ -	R\$ -	R\$ -

Cashflow Statement Failure							
	2019	2020	2021	2022	2023	TV	Sum
Year	0,67	2	3	4	5		
Operating cash inflows							
+ Netsales	R\$ 91.420,00	R\$ 407.550,00	R\$ -	R\$ -	R\$ -		
+ Other Income							
- Accounts receivable							
Net operating cash inflows	R\$ 91.420,00	R\$ 407.550,00	R\$ -	R\$ -	R\$ -		
Operating cash outflows							
+ Cost of goods sold less depreciation	R\$ 83.375,00	R\$ 187.260,00	R\$ -	R\$ -	R\$ -		
+ General and administrative expenses	R\$ 68.520,00	R\$ 263.800,00	R\$ -	R\$ -	R\$ -		
+ Selling Expenses	R\$ -	R\$ 45.720,00	R\$ -	R\$ -	R\$ -		
+ Taxes	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ D Inventory	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ D Prepaid Expenses	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
- D Accounts Payable	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Total operating cash outflows	R\$ 151.895,00	R\$ 496.780,00	R\$ -	R\$ -	R\$ -		
Net operating cash flow	-R\$ 60.475,00	-R\$ 89.230,00	R\$ -	R\$ -	R\$ -		
Priority Outflows							
+ Interest Expenses	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ Current Debt repayable	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ Lease payments	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Total Priority Outflows	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Discretionary Outflows							
+ Capital expenditures	R\$ 150.000,00	R\$ 200.000,00	R\$ -	R\$ -	R\$ -		
+ Research and Development expenses	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ Preferred stock dividends	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ Common stock dividends	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Total discretionary outflows	R\$ 150.000,00	R\$ 200.000,00	R\$ -	R\$ -	R\$ -		
Financial flows							
+ D Debt instruments (borrowings)	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ D Stock securities (equity)	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
+ D Term loans	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Total financial flows	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Net change in cash and marketable securities accounts							
+ Net operating cash flow	-R\$ 60.475,00	-R\$ 89.230,00	R\$ -	R\$ -	R\$ -		
- Priority outflows	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
- Discretionary outflows	-R\$ 150.000,00	-R\$ 200.000,00	R\$ -	R\$ -	R\$ -		
+ Financial flows	R\$ -	R\$ -	R\$ -	R\$ -	R\$ -		
Net change in cash and marketable securities accounts							
End-of-period cash balance	-R\$ 210.475,00	-R\$ 289.230,00	R\$ -	R\$ -	R\$ -		
Assumptions:							
Cost of Capital	50%	50%	40%	30%	30%	25%	
Growth after 2023						9,1%	
Discounted Value FCFF	-R\$ 160.622,49	-R\$ 128.546,67	R\$ -	R\$ -	R\$ -	R\$ -	-R\$ 289.169,15

Final DCF Valuation

Scenario Probabilities		DCF Value
Success	30%	R\$ 15.731.888,43
Sideways	50%	R\$ 4.471.298,23
Failure	20%	-R\$ 289.169,15
Enterprise Value		R\$ 6.897.381,81

