Methods and Criteria affecting Early-Stage Venture Valuation

Empirical evidence from Venture Capitalists and Business Angels

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Abstract—The valuation of Start-Ups, especially in an early stage of the life-cycle remains a difficult undertaking with a strong tendency towards subjectivity. Conventional valuation methods can generally not be applied, as they either do not adequately account for the characteristics of Start-Up companies or need to be considered as impractical. With fundraising for venture investments continuously increasing, this challenge deserves a closer investigation. We therefore developed a survey to get a deeper understanding of the valuation practice of German-speaking Venture Capitalists and Business Angels. The specific topics of interest in this survey included the knowledge and usage of methods for Start-Up valuation, the criteria and performance indicators considered to drive Start-Up value as well as the current situation and trends in venture investment. We found clear differences between early-stage Start-Up valuation practice and later-stage valuation practice with an overall strong tendency towards an increased level of subjectivity within the valuation process. This subjectivity is reflected by the valuation methods chosen, the partial lack of a structured investment approach as well as the impact of personal experience and gut feeling on valuation assumptions and indicators.

Keywords— start-up; NTBF; technology venture; valuation; valuation determinants; venture capital; entrepreneurial finance

I. INTRODUCTION

Start-Up companies play a key role in the structural change of economies. Due to their capability of flexibly reacting to new environmental and market conditions they create new industry sectors and force established companies to adapt to these changed conditions [1]. In order to grow, Start-Ups need substantial resources. Promoting Start-Ups, many governments hope to increase the overall growth of their economies. Established companies are also increasingly recognizing the innovative potential of young growth companies. They perform equity investments in order to gain access to new products and technologies. However, access to traditional financing instruments such as loans or borrowings remains insufficient for Start-Ups. The problem of scarce financial resources of Start-Up companies has diminished with the establishment of venture capital as a funding instrument and highly specialized venture capital companies closing this funding gap. Today, fundraising for venture investments is continuously increasing [2]. Besides money, venture capitalists support Start-Ups with comprehensive management know-how or business network [3]. Recent research suggests a positive impact of venture capital investments on the gross domestic product of a country [4].

One crucial step in the investment process for an equity financing of a Venture Capitalist or Business Angel, is the valuation of the target company. While many different techniques have been developed to value companies, most of them are not applicable for Start-Up valuation. The reason for that is that conventional valuation methods are based on historical data, which is available for established companies, but not yet for Start-Up companies. Attempts have been made to overcome this problem. For instance, the "Venture Capital Method" was developed, which is based on projected future data [5]. Still, the valuation of Start-Ups, especially in an early stage of the life-cycle remains "a difficult and often subjective process" [6].

II. RESEARCH PURPOSE AND DESIGN

A. Research Purpose

The purpose of this research was to get a deeper understanding of the valuation practice of German-speaking Venture Capitalists and Business Angels. The pursued deeper understanding is manifold: first, the knowledge and usage of valuation methods for Start-Up valuation needed to be explored. Second, the criteria and according performance indicators considered to drive Start-Up value and thus serving as the necessary basis for valuation methods needed to be analyzed in greater detail. Lastly, the current situation in venture investment needed to be investigated in order to provide a frame of reference to meaningfully discuss the responses given.

B. Research Design

In order to collect information on valuation practice of German-speaking Venture Capitalists and Business Angels, we have found a quantitative research approach to be appropriate. Thus, we developed an online survey accessible via the platform www.typeform.com. Participation in the survey was possible from April 22nd, 2017 to July 22nd, 2017. In this survey, each participant was asked a minimum of 9 questions

up to a maximum of 45 questions. No question was mandatory, i.e. participants were able to skip individual questions unanswered. All participants were asked 9 basic questions (questions: 1, 2, 3, 4, 6, 7, 10, 11, 13, cf. figure 1). In case certain answers were chosen, there were follow-up questions. For example, a participant positively answering to question 4 "Do you have an investment focus?", received a follow-up question asking him to further specify its focus. Accordingly, the number of questions per participant differed as a result from the responses chosen. The questions can be divided into three different topics:

1) Investor characteristics: The first set of questions (Questions 1 to 5, cf. figure 1) was used to gain a general understanding of each participant. These questions focused on the investor-type (i.e. Private Venture Capital Fund, Public Venture Capital Fund, Corporate Venture Capital Fund or Business Angel) and pursued investment profile (e.g. preferred life-cycle phase or particular investment focus).

2) Valuation methods: The second set of questions (Questions 6 to 41, cf. figure 1) attempted to capture the most accurate picture of valuation methods known to relevant investors and procedures used in the practice of Start-Up valuation. Thus, one main concern of the questions was whether the participants were knowledgeable on the usual qualitative and quantitative valuation methods (e.g. Scenario Analysis, Discounted Cash Flow Method, Multiples, Venture Capital Method [7]) and if they would actually use them in valuation practice. In addition, the participants were asked if these valuation methods were appropriate to derive Start-Up value or if there were considerable concerns with regards to their application and results. Finally, the participants were asked to identify key criteria and according performance indicators – financial and non-financial in nature – which are considered to have a clear impact on the valuation result.

3) Current situation in venture investment: The last set of questions (Questions 42 to 45, cf. figure 1) focused on the current situation in venture investment. Participants of the survey were thus asked, if venture investors (i.e. Venture Capitalists and Business Angels) have fixed return expectations and if so, how high these expectations are set. Further, participants were asked whether the valuation proposed by Start-Ups themselves is appropriate or whether high company valuations are mainly driven by the current low interest rate environment.

C. Data Sources and Sample

The objective of the present study was to motivate as many venture capital professionals and Business Angels as possible to participate and complete the prepared questionnaire. Therefore, we reached out to potential candidates through three different channels.

First, we performed a desk research on relevant venture capital firms' and Business Angels' online presence in order to identify suitable candidates. These candidates were listed in a structured document and contacted via telephone to initiate their participation in the survey.
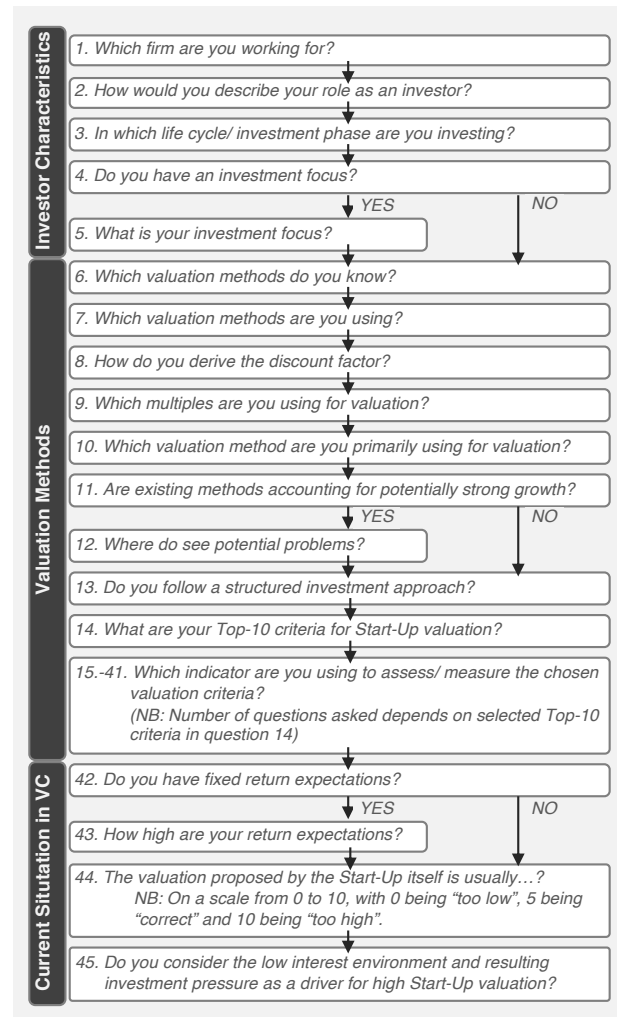

Fig 1. Question overview and structure of the questionnaire

Second, we performed a desk research on relevant venture capital professionals and Business Angels via professional associations (i.e. Bundesverband Deutscher Kapitalbeteiligungsgesellschaften) and professional social networks (i.e. LinkedIn and Xing). The identified potential candidates were contacted via these platforms or, if available, the accessible e-mail addresses.

Lastly, we distributed the link to our online survey via relevant mailing lists including venture capital professionals and Business Angels only. The mailing lists are administered by the "CyberForum e.V." (Karlsruhe) and the "Vereinigung Baden-Württembergische Wertpapierbörse e.V." (Stuttgart).

Following this approach to reach a high number of relevant professionals, a total of n=54 participants was achieved.

III. RESULTS AND DISCUSSION

In analogy to the defined research design and the according structure of the questionnaire, the results reflect the three main topics to be addressed:

A. Investor characteristics

Out of the total sample (n=54), 47% of respondents described themselves as Private Venture Capital Funds, 24% as Business Angels, 11% as Public Venture Capital Funds, 9% as Corporate Venture Capital Funds and the remaining 9% as other venture investor types.

Confronted with the question in which life-cycle/ investment phase the investor is investing (multiple answers possible), 78% of respondents reported to be active within the "Conception & Development" stage, 76% in the "Commercialization" stage, 33% in the "Growth" stage and only 2% are active in later stages (cf. [8], [9] for a description of stages). Thus, on a combined basis, 96% of respondents are active during the "Seed" and "Start-Up" stages (i.e. "Conception & Development" until early "Growth") of a venture.

Following the question on whether an investment focus is pursued, 20% of the participants declined to have an investment focus. The remaining 41% of respondents stated to follow a cross-sector investment strategy including both technology ventures and business model driven ventures, 35% mentioned a focus on technology ventures only (i.e. New Technology-Based Firms; NTBF [10], [11]) and 4% mentioned a focus on business model driven ventures. Thus, on a combined basis, 76% of respondents are either generally or specifically focusing their investments on early-stage technology ventures and are thus expected to be knowledgeable on how to value technology.

B. Valuation methods

The first set of questions focusing on valuation methods for Start-Up valuation explored the methods known to venture capital professionals and Business Angels as well as their usage in valuation practice. For both questions, multiple answers were given. With 91% of respondents (total n=54) knowing about valuation by multiples, this method represents the most well-known valuation method. This is followed by the Discounted Cash Flow Method (85%), the Venture Capital Method (69%), Scenario Analysis (54%) and Real Option Approach (30%). The remaining 2% of respondents stated to apply personal experience and other, less conventional methods in the valuation context. Interestingly, the usage of these methods for Start-Up valuation differs greatly. Even if the valuation by multiples is not only the most-well known method but also the most applied method in a valuation context of early-stage ventures (74% of respondents agreed to apply multiples for Start-Up valuation purposes), the Venture Capital Method becomes second (43%) passing the Discounted Cash Flow Method (37%). This is followed by Scenario Analysis (26%), other, less conventional valuation methods (15%) and finally, the Real Option Approach (4%). It is striking that the other, less conventional methods stated by relevant respondents are in general based on own experience with Start-Up valuation (9%), no methods at all (4%), as these are expected to not reflect the real value of the Start-Up, or own negotiation skills to define a value (2%). Following the question on "which valuation method is used primarily for valuation", relevant respondents (n=46) mentioned Multiples (52%), Discounted Cash Flow Method (22%), Scenario Analysis (4%), Venture Capital Method (2%) and Real Option Approach (2%). Intriguingly, 28% of respondents mentioned personal experience and gut feeling as the primary approach to derive a valuation. It needs to be pointed out that multiple answers were needed to be given due to the fact that the valuation methods chosen differ in function of the life-cycle stage of the Start-Up to be valued. Thus, in very early stages of the life-cycle (i.e. "Conception & Development"), multiples and investment experience provide the basis for valuation. In the following life-cycle stages (i.e. "Commercialization" and "Growth") the focus in terms of valuation methods shifts towards the Discounted Cash Flow Method and Venture Capital Method as the Start-Up's track record provides an improved basis for analysis. The results of this set of questions prove that the majority of respondents is active in very early stages of Start-Up life-cycle and is thus relying on multiples and personal experience to derive a valuation. Even if a diverse set of valuation methods is used and also applied, the method of choice for more complex valuation remains the Discounted Cash Flow Method.

With multiples being the valuation method of choice, a further investigation into the preferred multiples used in the valuation process seemed necessary. Based on the answers provided by relevant respondents (n=40) 70% consider Enterprise Value divided by Earnings before Interest and Taxes (EBIT) the most promising valuation multiple. This is followed by Enterprise Value divided by Earnings before Interest, Taxes, Depreciation and Amortization (EBITDA) with 68%, Price-Earnings-Ration with 33% and other, less conventional multiples with 20%.

Confronted with the question on how the discount factor is derived, only n=34 participants did answer. The majority of respondents (68%) stated to derive the discount factor based on experience. This is followed by 56% considering the targeted return of investors as the basis for their calculation. The Weighted Average Cost of Capital (WACC) is applied by 29% of respondents, followed by 12% focusing only on equity returns through means of the Capital Asset Pricing Model (CAPM). This is interesting, as we expect Start-Ups, in particular in early stages of the life-cycle, to be primarily equity financed, making the CAPM a legitimate approach to derive a meaningful discount factor [12]. Thus, we assumed CAPM to be at least slightly more often used than the WACC. The remaining 3% of respondents follow other approaches to derive the discount factor needed for performing certain valuation methods.

Even though the wide majority of respondents actively use the above described valuation methods in practice, out of n=54 respondents, only 52% consider these valuation methods as appropriate to account for the potentially strong growth of Start-Ups. The remaining 48% do not consider these valuation methods as appropriate. It further remains a possibility, that the real number of investment professionals considering conventional valuation methods as inappropriate is much higher. This hypothesis is based on a potential bias in the way the present questions were answered. We believe, that some investors would in general agree that certain valuation methods are not suitable but would not admit to be using valuation methods that do not serve the pursued purpose. The fact that

the questionnaire could have been answered anonymously is mitigating the risk of a strong bias in this case. However, a potential bias needs to be taken into account when discussing the present findings. Nevertheless, certain explanations for this present result become apparent in the answers given and are further reflected in relevant literature. First, the necessary data for applying specific valuation methods cannot yet be provided by the Start-Ups analyzed. This is mainly due to the fact that these Start-Ups are in a very early stage of the life-cycle and thus do not yet dispose of a track record or company history [13]. Consequently, there is no basis in order to correctly implement and adjust these valuation methods, thereby increasing the subjectivity of the valuation process [6]. Second, the conventional valuation methods are not suitable to value high-growth companies as they cannot account for growth that is not yet reflected in the present data. As the value of Start-Up companies is mainly defined by its future [14], growth becomes a crucial aspect in Start-Up valuation. Therefore, the discussed valuation methods are not in any case suitable in valuation practice – at least in the early stages of Start-Up life-cycles.

The second set of questions focusing on valuation methods for Start-Up valuation explored the criteria and performance indicators considered to drive Start-Up value.

Interestingly, out of n=54 respondents, only 61% stated to follow a structured investment approach. Consequently, 39% of respondents pursue a subjective and potentially opportunistic investment approach.

Following this question, the respondents considering themselves to follow a structure investment approach were asked to select the Top-10 out of various criteria that are considered to impact Start-Up value. Only n=31 did perform the asked selection task. The resulting Top-15 criteria affecting Start-Up value are in order of the number of mentions/ selections: Competencies of the Entrepreneur/ Team (26 mentions), Scalability (25), Team-Investor-Fit (21), Enthusiasm/ Trustworthiness of the Entrepreneur/ Team (20), Unique Selling Proposition (19), Market Growth (17), Capital Requirements (16), Team Completeness/ Complementarity (16), Sales Potential (15), Competition (15), Product Status Quo (13), Comprehensible Financial Planning (13), IP (12), Deal Structure (11), Return on Investment (10). The structure of these Top-15 criteria are very much comparable to existing literature [12], [15]–[20], thereby increasing the validity of the recent results. Besides the valuation criteria's structure, the order of importance represents a point of interest. We hypothesize that the number of mentions in the study is an indicator of criteria importance in the valuation process. Even though the resulting criteria and their ranking cannot be directly matched to existing rankings [20], the implicit order is comparable.

Following the selection of relevant criteria, the respondents (n=33) were asked to define performance indicators, preferably measureable, in order to enable a meaningful assessment. However, out of n=243 mentions of indicators within the investment decision process, only n=29 mentions are of quantitative nature. Within the remaining n=214 indicators,

"personal impression" (n=29), "experience" (n=23) and "gut feeling" (n=20) score among the Top 3 indicators.

C. Current situation in venture investment

The objective of this final topic within the prepared questionnaire pursued a better understanding of venture investment status quo.

First, the return expectations of respondents were investigated. 57% of respondents (n=53) stated to not have fixed return expectations from Start-Up investments. The remaining 43% did confirm to have fixed return expectations. These range between 10% and 300% per annum, even though the results of 200% and 300% were probably not considered on a per year bases but until maturity, effectively limiting the return expectations per annum to 50%. Second, respondents were asked if the proposed valuation by Start-Ups themselves was, on a scale from 0 to 10, with 0 being "too low", 5 being "correct" and 10 being "too high". The relevant answers resulted in an average of 8.02, thus being very high.

Second, current macroeconomic influences on Start-Up valuation was explored. Confronted with the question if "the current interest rate environment and the existing investment pressure was driving prices for Start-Up investments", 74% of respondents (n=53) agreed with "YES".

IV. CONCLUSION

Following the analysis of the questionnaire's results, differences between early-stage Start-Up valuation practice and later-stage valuation practice become apparent. These appear to be independent of the Venture Capitalist's or Business Angels' investment focus. Overall, a strong tendency towards an increased level of subjectivity within the valuation process becomes apparent.

First, the valuation methods applied in an early stage of the Start-Up life-cycle have a clear tendency towards subjectivity (i.e. multiples) and are largely shaped by personal experience of the investor. More sophisticated valuation methods, such as the Discounted Cash Flow Method, are preferred for later-stage investments. However, also more sophisticated valuation methods are based on data and criteria that are influenced by assumptions, personal experience and gut feeling. This is confirmed by the majority of respondents (68%) stating to derive the discount factor based on experience. Intriguingly, the results of this questionnaire further prove that the majority of respondents is active in very early-stages of Start-Up life-cycle and is thus relying on multiples and personal experience to derive a valuation. Even if a diverse set of valuation methods is used and also applied, the method of choice for more complex valuation remains the Discounted Cash Flow Method.

Second, analyzing the criteria taken into account within the valuation process in greater detail, the above stated tendency towards subjectivity, in particular in an early stage, becomes more pronounced. A structured investment approach is followed by only 61% of respondents. Thus 39% of respondents stated to not follow a structured investment approach and therefore pursue a potentially opportunistic and subjective investment approach not taking into account a

defined set of criteria. Out of the remaining investment professionals (61%), who describe themselves as following a structured investment approach, a wide majority (88%) does not have measurable performance indicators for these criteria and thus mentions subjective performance indicators such as "personal impression", "gut feeling" and "experience" as the basis of their decisions.

Third, a ranking of Top-15 valuation criteria in a hypothesized order of importance was derived. Certain parallels to existing research become apparent and confirm the validity of the questionnaire's results. However, the relative importance of criteria and their specific impact on the valuation will need to be investigated in further research as it cannot be clearly established based on the present data.

Lastly, Venture Capitalists and Business Angels participating in this survey agreed on Start-Ups valuing themselves at a premium. Further, they confirmed that the current price level is strongly driven by the current low interest rate environment and the therefore existing investment pressure.

REFERENCES

[1] J. Egeln, "Die volkswirtschaftliche Bedeutung junger Unternehmen," in *Existenzgründung*, G. Buttler, H. Herrmann, W. Scheffler, and K.-I. Voigt (Hrsg.), Eds. Heidelberg: Physica, 2000, pp. 3–32.

[2] HighTech Startbahn, "Activating Venture Capital for European Innovation," *3rd Edition*, pp. 2–7, 2017.

[3] M. Schefczyk, *Finanzieren mit Venture Capital und Private Equity*. Stuttgart: Schaffer-Poeschel Verlag, 2006.

[4] T. Meyer and A. Stobbe, "Venture capital adds economic spice," *Res. Brief.*, p. 6, 2010.

[5] D. R. Scherlis and W. A. Sahlman, *A Method for Valuing High-risk, Long-term Investments: The "Venture Capital Method."* Harvard Business School Publishing, 1989.

[6] A.-K. Achleitner, "Start-up-Unternehmen: Bewertung mit der Venture-Capital-Methode," *Betriebs Berater*, no. 18, pp. 927–936, 2001.

[7] A.-K. Achleitner and E. Nathusius, "Bewertung von Unternehmen bei Venture-Capital-Finanzierungen," 2003.

[8] R. K. Kazanjian, "Relation of Dominant Problems to Stages of Growth in Technology-Based New Ventures," *Acad. Manag. J.*, vol. 31, no. 2, pp. 257–279, 1988.

[9] R. K. Kazanjian and R. Drazin, "A Stage-Contingent Model of Design and Growth for Technology Based New Ventures," *J. Bus. Ventur.*, no. 5, pp. 137–150, 1990.

[10] D. Storey and T. Bruce, "A Review of the empirical knowledge and an assessment of statistical data on the economic importance of new technology based ' firms (NTBFs) in Europe," 1996.

[11] M. Almus and E. a Nerlinger, "Growth of New Technology-Based Firms: Which Factors Matter? - Springer," *Small Bus. Econ.*, vol. 13, no. 2, pp. 141–154, 1999.

[12] G. Festel, M. Wuermseher, and G. Cattaneo, "Valuation of Early Stage High-tech Start-up Companies," *Int. J. Bus.*, vol. 18, no. 3, pp. 216–231, 2013.

[13] C. Kaserer, A.-K. Achleitner, C. von Einem, and D. Schiereck, *Private Equity in Deutschland. Rahmenbedingungen, ökonomische Bedeutung und Handlungsempfehlungen. Abdruck des Forschungsgutachtens fe 3/06 "Erwerb und Übernahme durch Finanzinvestoren (insbesondere Private-Equity-Gesellschaften)" für das Bundesministerium der Finanzen*. Norderstedt: Books on Demand GmbH, 2007.

[14] A.-K. Achleitner, "Wie legen Risikokapitalgeber beim Einstieg in neu gegründete Unternehmen den Preis fest?," 2002.

[15] L. Feeney, G. H. Haines, and A. L. Riding, "Private investors' investment criteria: Insights from qualitative data," *Ventur. Cap. An Int. J. Entrep. Financ.*, vol. 1, no. 2, pp. 121–145, 1999.

[16] H. Landström, "Informal investors as entrepreneurs," *Technovation*, vol. 18, no. 5, pp. 363–365, 1998.

[17] C. M. Mason and R. T. Harrison, "Informal venture capital: a study of the investment process, the post-investment experience and investment performance," *Entrep. Reg. Dev.*, vol. 8, no. 2, pp. 105–126, 1996.

[18] A. L. Maxwell, S. A. Jeffrey, and M. Lévesque, "Business angel early stage decision making," *J. Bus. Ventur.*, vol. 26, no. 2, pp. 212–225, 2011.

[19] R. Sudek, "Angel Investment Criteria," *J. Small Bus. Strateg.*, vol. 17, no. 2, pp. 89–103, 2006.

[20] M. Van Osnabrugge and R. J. Robinson, *Angel Investing: Matching Start-up Funds with Start-up Companies - The Guide for Entrepreneurs, Individual Investors, and Venture Capitalists*. San Francisco: Jossey-Bass, 2000.