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**Cognitive bias in the judgment of business valuations and valuers :
how systematic patterns of irrationality affect entrepreneurs, legal
professionals and business valuers**

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1 Introduction

If business schools could offer just one course, it would not be on stock trading, the efficient market hypothesis, or modern portfolio theory. Rather, B-schools should be encouraging students to learn the boring, but critically important, discipline of business valuation.

– Warren Buffett –

1.1 BACKGROUND AND SCOPE OF THE RESEARCH

Translating the theoretical framework of business valuation into practice is one of the most complex and challenging disciplines in corporate finance (Pratt & Niculita, 2008). This is specifically true when the widely-accepted Discounted Cash Flow (DCF) method is used which, despite its preciseness, can swing a valuation outcome, as the predictive nature of the method requires numerous assumptions to be made. Due to this complexity, there is a wide range of research on this subject, varying from quantitative aspects of business valuations (e.g., Abrams, 2001; Hitchner, 2011) to studies on the more behavioral aspects (e.g., Fedotova, Pleskachevskiy, Rutgaizer, & Buditskiy, 2009; Scott, Stumpp, & Xu, 1999). In the words of Professor Aswath Damodaran, the renowned finance and valuation expert at the Stern School of Business at New York University: “Valuation lies at the heart of much of what we do in finance, whether it is the study of market efficiency and questions about corporate governance or the comparison of different investment decision rules in capital budgeting.” (Damodaran, 2006b, p. 2)

Business valuations are conducted for a variety of purposes, such as investment decisions (Damodaran, 2012b), buy-sell decisions in the context of mergers and acquisitions (e.g., Mellen & Evans, 2010; Weaver, Harris, Bielinski, & MacKenzie, 1991), turnarounds, financial distress, restructurings and bankruptcy (Calandro Jr, 2011; Damodaran, 2009b; Ratner, Stein, & Weitnauer, 2009), tax issues in the context of an estate, gift or corporate taxation (Beatty, Riffe, & Thompson, 1999; Brennan & Schwartz, 1978; Englebrecht, Anderson, & Martinson, 2011; Fross, 1996; Jackson, Pippin, & Wong, 2013; Laro & Pratt, 2011), financing (e.g., Inselbag & Kaufold, 1997; Ruland & Zhou, 2005), and differences of opinion between business owners (Joyce Jr. & Holt, 2002; Schwartz & Bryan, 2012). Whereas on many occasions these valuations are carried out in harmony, not infrequently are both

parties' interests diametrically opposed, and a dispute imminent.¹ In these disputes, valuations often play a central role as they provide the opportunity to quantify and express stakeholders' business interests in monetary terms. They may also magnify an existing dispute, or even cause a new dispute due to business valuations' often significantly varying outcomes as a result of diverging presumptions (e.g., Risius, 2019). Strengthened by a global increase in the number of transactions between companies and their respective shareholders and, for example, the growing use of appraisal rights by companies' (minority) shareholders (Korsmo & Myers, 2018), the need for business valuations is eminent and ever-increasing (Dukes, 2001).

The finance literature broadly recognizes three conceptual valuation approaches to determine the so-called 'fair value' of a company, its equity, or an asset: the asset approach, the market approach, and the income approach (e.g., Hitchner, 2011).² In different types of disputes, where valuation plays a role, the so-called Discounted Cash Flow (DCF) method, a key method of the income approach, is regularly used. This method, which has several variants, consists of three key elements: 1) future income expressed in cash flows, 2) the time value of money, and 3) the discount rate.³ In practice, many disputes concerning a business valuation find their origin in one or more of these three elements. Discussions in the academic literature stem from debates about the different standpoints and approaches concerning these elements (e.g., Bodenhorn, 1964; Cassia & Vismara, 2009; Fama, 1977; Fama & French, 2006; Fernández, 2007; Krüger, Landier, & Thesmar, 2015; Luehrman, 1997; Miles & Ezzell, 1980; Penman & Sougiannis, 1998; Ruback, 2002; Sabal, 2008).

Although the literature lacks consensus regarding whether one valuation approach is superior to another (Plenborg, 2002), most of the approaches considered conceptually correct are based on cash flow discounting (Fernández, 2007). Indeed, as can be observed in the literature, "This approach gets the most play in academia and comes with the best

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- 1 Consider for example the situation in which one of two shareholders would like to buy out the other, as a result of an interpersonal conflict, and both cannot agree on the price of the shares, or a dispute between parties' business interests that ensue from a tort. In these real-life situations, stakeholders aim to protect their business interest, often they each have a valuation conducted, and they frequently find their way to court (e.g., Coil, 2014).
 - 2 The asset approach refers to the valuation of a company on the basis of the fair market value of a company's assets and liabilities as presented in the balance sheet. In the market approach values are based on the market prices of comparable companies. The income approach utilizes the present value of future income to value a company.
 - 3 In essence, the economic value of an object (e.g., a company) is based on the notion that future income expressed in cash flows generated by that same object is worth less than the same income today, because money available now can be invested to produce additional income in the future. Therefore, the DCF-method entails that projections of future income (cash flows) are discounted to a single present value (PV) by a discount rate that reflects the required rate of return or an opportunity cost that would compensate for the time value of money (Dulman, 1989). In other words: "value today always equals future cash flows discounted at the opportunity cost of capital" (Brealey, Myers, & Allen, 2014, p. 93).

theoretical credentials.” (Damodaran, 2006b, p. 4). Among finance scholars it is generally considered the preferred approach for valuing both publicly-held and closely-held companies (Fernández, 2007; Mukherjee, Kiymaz, & Baker, 2004). In practice, however, valuations are often performed by applying a combination of the three broad valuation approaches (i.e., asset approach, market approach, income approach).

Interestingly, the current DCF-method has a multifaceted origin. In an overview article on its history, Parker (1968) notes, first of all, that DCF is conceptually and partly based on the compound interest theory that goes back to the Old Babylonian period (c. 1800-1600 B.C.) in Mesopotamia, but that it also has roots in the fields of actuarial science, engineering, and the theory of capital. Second, the first application of the DCF-method was predominately related to loans and life insurance due to their predictable characteristics. However, it was only in the middle of the nineteenth century that its application was extended to investments in fixed assets (Parker, 1968). This extension to investments in fixed assets was mainly due to two reasons. First, engineers in the US and Europe embraced new techniques and developments, and therefore needed to project the returns of large investments, like for example investments in railway constructions in the US (Parker, 1968) or projects having a public purpose in France (Pezet, 1997). Second, a number of economists started a discussion on theories of capital like discounting, capitalizing, and compound interest. Driven by the positive economic circumstances of the time, more capital-intensive projects arose where significant cash outflows came before cash inflows, and alternative valuation methods were needed to value these projects (Dulman, 1989; Parker, 1968; Pezet, 1997; Rutterford, 2004). Nevertheless, it took until the twentieth century, also through seminal articles on discounting dividends (e.g., Gordon, 1959), before the DCF-method gained widespread theoretical acceptance for capital investment decisions (Edwards & Warman, 1981), first in the United States, and later on in Europe. Following the strong rise of promising technology companies in the late twentieth century, the DCF-method also became popular amongst practitioners, as there were increasing numbers of fast-growing technology companies with negative earnings but promising outlooks that could not be valued using traditional methods, such as price-earnings ratios (Rutterford, 2004).

Despite today’s acceptance and widespread application, academics and practitioners acknowledge that the DCF-method is sensitive to variations in the many input variables the method requires, including the way these variables are estimated (Bancel & Mittoo, 2014). This input-sensitivity, for example, relates to the assumptions made with respect to important DCF-elements such as future cash flows and related growth rates (e.g., Danielson, 1998), the length of the forecast horizon (e.g., Cassia & Vismara, 2009; Ohlson & Zhang, 1999), the estimation of the cost of capital / discount rate (e.g., Brotherson, Eades, Harris, & Higgins, 2013; Bruner, Eades, Harris, & Higgins, 1998), the rate of (re)investments (e.g., Beidleman, 1984; Dudley & Jr., 1972), assumptions towards the tax shield and tax rate (e.g., Arzac

& Glosten, 2005; Dempsey, 2013; Fernández, 2004; Lahmann, Arnold, & Gmehling, 2017), and the terminal value (e.g., Damodaran, n.d.-b; Jennnergren, 2013; Levin & Olsson, 2000; Lütolf-Carroll, Pirnes, & Withers LLP, 2009; Meitner, 2009; Reis & Augusto, 2013). Practice shows that even small deviations in these input variables can have a significant impact on a valuation outcome. This sensitivity is at the heart of the criticism of the DCF-method. Other often-heard criticisms of the method involve the fact that conventional DCF-valuations fail when future cash flows in projects must be conditioned on future decisions (Kulatilaka & Marcus, 1992), the impreciseness of the DCF-method when valuing early stage firms (Kim & Ritter, 1999), the importance of cash flow estimation (e.g., Kumar, 2016; Pohlman, Santiago, & Markel, 1988), and the little attention paid to how these future cash flows must be estimated (Damodaran, 2005). Other critics note the risk business valuers face of being affected by the lack of guidance on how to estimate valuation parameters, on the estimation method itself, and the lack of consistency in the valuation process (Bancel & Mittoo, 2014; Dukes, 2001). Finally, and not unimportantly, applying simplified assumptions in a DCF-based valuation can significantly impact the valuation outcome and may also introduce cognitive bias in valuation outcomes (Plenborg, 2002). Obviously, all these elements are a source of potential conflict, not infrequently resulting in a dispute.

To date, valuation disputes tend to focus on the technical, mostly arithmetical, aspects of business valuation, and many valuation disputes, therefore, concentrate on valuation input variables and their corresponding values. A striking example is the Dell case (*Memorandum Opinion: In re Appraisal of Dell Inc.*, 2016).⁴ In 2016, the Delaware Court of Chancery published its opinion in the Dell Inc. statutory appraisal action which arose out of the 2013 management buyout (MBO) led by the company's founder and CEO, Michael Dell. As Business Valuation Resources (BVR, 2016) summarized, the Delaware court concluded that the transaction price negotiated between parties for this MBO did not reflect the fair value of Dell, an IT-hardware manufacturer. In short, in 2012, Michael Dell considered an MBO and approached several co-investors to discuss a possible transaction. Earlier, at the beginning of 2011, Michael Dell and Dell's management valued the company between USD 22.49 and USD 27.05 per share, while the market traded Dell's stock at around USD 14 per share. In 2013, Michael Dell and investment firm Silver Lake ultimately acquired Dell for USD 13.96 per share (including a special cash dividend of USD 0.13 per share and a third quarter dividend of USD 0.08 per share). The majority of the holders of outstanding shares voted in favor of the MBO, which was technically structured as a merger. Some shareholders, however, did not agree with the defined price and started an appraisal proceeding. In court, both parties conducted a DCF-valuation to determine the company's fair value.

4 In re Appraisal of Dell Inc., No. 9322-VCL, 2016 WL 3186538, at *1-114 (Del. Ch. May 31, 2016).

The petitioners' expert, Professor Bradford Cornell, concluded that Dell represented a fair value of USD 28.61 per share on the closing date, while the respondents' expert, Professor Glenn Hubbard, concluded on a fair value of USD 12.68 per share on the closing date. Two highly distinguished valuation experts generated opinions that differed by 126%, or approximately USD 28 billion, primarily due to strong differences in critical inputs. The court observed that, despite applying similar valuation principles, such large differences are a 'recurring problem'. In the case at hand, according to the court, the difference in the experts' DCF-valuations was primarily driven by the projected cash flows the experts used. As the court considered that neither of the analyses was credible enough, they performed their own DCF-analysis. This analysis resulted in a fair value of USD 17.62 per share. Simply put, according to the court, Mr. Dell undersold the company by about USD 7 billion (to himself, among others).

This Dell case is illustrative of the many valuation disputes worldwide, whether concerning large or small companies, publicly-held or closely-held companies, or large or small business interests, where technical aspects of a valuation and its input values to a large degree catalyze the nature and scope of the dispute.

Interestingly, in 2017, the court's opinion was reversed by the Delaware Supreme Court⁵, yet the manner in which it was reversed has been hotly debated. For example, in 2018, two law school professors – Charles Korsmo and Minor Myers⁶ – criticized the Supreme Court's decision on the Dell case on a few key points. A major point of their criticism concerned the role of human judgment during the valuation exercise, or literally: "[the Delaware Supreme Court is] downplaying the essential role of human judgment" (Korsmo & Myers, 2018, p. 1). In a similar vein, they noted: "(...) the court approached valuation as a mechanical arithmetic exercise, attempting to evade the unavoidable need for human judgment." (Korsmo & Myers, 2018, p. 6) and, "(...) the court attempted to strip the judicial valuation exercise of human judgment, relying instead on mechanical, arithmetical calculations." (Korsmo & Myers, 2018, p. 69).

Underestimating the importance of human judgment in valuation exercises is a key limitation of the current body of knowledge on business valuation. As such, an emphasis on human judgments warrants a thorough exploration of the potential influence of cognitive biases. These biases and their effects have not been paid much research attention in business valuation, but form a central theme within the research field of social psychology, and are also well addressed in other scientific fields like for example law, medicine, and behavioral economics. The psychological literature indicates that when people are faced with highly complex and uncertain situations or

5 Dell, Inc. v. Magnetar Global Event Driven Master Fund Ltd., et al., No. 565, 2016, (Del. Dec. 14, 2017).

6 Korsmo is Professor of Law at Case Western Reserve University School of Law, and Myers is Professor of Law at Brooklyn Law School.

have to make judgments on these, they tend to rely on heuristics (Tversky & Kahneman, 1974). When heuristics are used, cognitive biases can occur. These can be explained as systematic patterns of irrationality (i.e., thinking errors) which human cognition reliably produces compared to rational thinking (Haselton, Nettle, & Andrews, 2015).

Thus far, little research attention has been devoted to the evaluation process of those who have to form an opinion on a business valuation (i.e., a judgment), whether these are people with few skills or who lack the knowledge to do so, or are valuers who frequently have to form a professional opinion about a valuation (outcome) conducted by another valuation expert.⁷ The psychological literature indicates that when people are faced with highly complex and uncertain situations, such as valuations, they tend to rely on heuristics (Tversky & Kahneman, 1974). When heuristics are used, cognitive biases in people's judgments can occur. Whereas the impact of cognitive biases on financial decision-making has received ample research attention in the finance literature (e.g., Bikas, Jurevičienė, Dubinskas, & Novickytė, 2013; Daniel, Hirshleifer, & Subrahmanyam, 1998; De Bondt & Thaler, 1995; Shefrin & Statman, 1985; Shiller, 2003; Slovic, 1972), scant research efforts have been devoted to its influence on business valuations, with the exception of some references to its alleged existence in diverse valuation issues (e.g., Adebambo & Yan, 2018; Baker, Ruback, & Wurgler, 2007; Ben-David, Graham, & Harvey, 2007; Heaton, 2002; Nikolic & Yan, 2014). Research devoted to cognitive biases in the context of business valuation focuses predominantly on the (input) biases that occur during the valuation process, with Professor Damodaran (Damodaran, n.d.-c, 2006a, 2009a, 2012a, 2015, 2017) as one of the key protagonists forwarding some anecdotal evidence.

Building on this initial evidence about the influence of cognitive biases in the process of conducting a valuation, there is a need for research on the role of cognitive biases when key stakeholders evaluate and judge a business valuation outcome and its responsible valuator. Ultimately, valuation practice is better served with a broader understanding of the cognitive biases that exist in disputes where business valuations are a part of, and, in particular, *why sound valuations can be perceived as poor, and poor valuations can be perceived as sound*. In other words, by enhancing our understanding of the effects of systematic patterns of irrationality on the judgment of valuations and valuers a path to reducing (unnecessary) disputes in practice may be found.

7 For example, consider the situation in which a court appointed expert witness has carried out a business valuation, and where both parties and their lawyers disagree on the valuation outcome. Or, when shareholders who want to part ways and engage a single business valuator to determine the value of a shareholder's interest and those involved, find out that they are diametrically opposed with regard to the valuation outcome. Think also of a financial restructuring situation, in which a bank considers accepting a haircut on the outstanding loan but wants to know what the company's post-restructuring value will be, yet the bank and client disagree on the valuation outcome.

1.2 AIM AND OBJECTIVES

To provide direction for the research, the following overall purpose statement was formulated:

This thesis aims to enhance our understanding of valuation disputes by exploring the role of cognitive biases in the judgment of business valuation outcomes and business valuers.

A *valuation dispute* is a difference of opinion about a business valuation outcome between two or more stakeholders who have an interest in the outcome of that business valuation. In most cases, entrepreneurs, investors, legal professionals, bankers, or valuers will be the key stakeholders in these disputes. *Business valuation outcome* refers to the numerical outcome that flows from the methodical approach used to measure the economic value of a company, a company's equity, an ownership interest therein, or an (intangible) asset. *Business valuers* (also *valuers*) are professionals (hereafter also referred to as valuation experts or valuation specialists) who have the expertise to conduct a business valuation. They are often associated with an accredited professional (valuation) body. *Cognitive biases* are defined as systematic patterns of irrationality, that is, as the notion that humans can be affected in their judgments and decisions by factors that should, if they were to behave fully rationally, not have any bearing on these judgments and decisions (Tversky & Kahneman, 1974).

To achieve and clarify the research aim, we have formulated three objectives which will contribute to the scientific body of knowledge of valuation and valuation practice:

1. To examine how cognitive biases affect entrepreneurs, legal professionals, and business valuers when they evaluate and judge valuation outcomes and valuers.
2. To explore whether the effect of cognitive biases on the evaluation and judgment of a business valuation outcome is recognized by valuation experts in practice.
3. To develop a Statement of Principles for business valuers that seek to reduce valuation disputes following from judgments that are affected by cognitive biases.

1.3 OUTLINE OF THE METHODOLOGY

We employed an Experimental Vignette Methodology (EVM) using cross-sectional data. Cross-sectional data means we draw subsets (samples) from several larger populations (i.e., entrepreneurs, legal professionals, business valuers). A study using EVM is similar to randomized controlled trials

(RCTs), often considered the gold standard of evidence (Meldrum, 2000). In such designs, research participants are randomly assigned to one of the experimental conditions to test for the effectiveness of a treatment condition relative to a control condition (in RCTs), or as in the present case to test for differences between two or more conditions (i.e., different versions of a vignette) (Bryman, 2016). The key benefit of experimental study designs in general is that they allow for causal inferences to be drawn. For example, Aguinis and Bradley (2014, p. 352) state that “understanding causal relationships requires the use of experimental or quasi-experimental designs” (see also Flannelly & Jankowski, 2014; Imai, Tingley, & Yamamoto, 2012). This means that the observed effects, assuming sufficient statistical power and statistically significant effects, can most likely be explained by the factors that are varied across conditions, meaning that the variables have a causal influence on the phenomena being investigated.⁸ Being able to draw causal influences is a substantial benefit over most alternative methodologies such as observational, correlational, or qualitative methods in general, for which it is harder to make any strong claims regarding causality.

We considered the experimental vignette methodology as being particularly appropriate for two reasons. First, as we are interested in the potential biasing effect of certain pieces of irrelevant information, this can best be studied by exposing a particular sample to such information and comparing people’s judgments with those of a sample that did not have access to the irrelevant information. If differences in judgments are observed, it is likely that these differences can be explained by differences in information they were exposed to. Hence, using this method allows for investigating the potential biasing effect of certain information used in making judgments. Second, given the suitability of this method for investigating the effects of cognitive biases, its widespread application in the literature confirms the appropriateness of using it to study biases (e.g., Aguinis & Bradley, 2014; Baron & Hershey, 1988; Epley & Gilovich, 2006; Fischhoff, 2003; Morewedge & Giblin, 2015; Tversky & Kahneman, 1974).

For the purpose of the research, three distinct key stakeholders in valuation disputes have been identified: (1) entrepreneurs as they make investment decisions based on a valuation outcome; (2) legal professionals as they are involved as professional users of a business valuation; and (3) business valuers as they conduct valuations themselves or judge other valuers’ work. Considering the differences between these different stakeholders and the different biases by which they might be affected, three experimental studies were conducted investigating different (but somewhat overlapping) biases.

8 There is of course always the possibility of incorrectly rejecting the null hypothesis (i.e., concluding there is an effect, when in fact there is an effect of the treatment condition in the population (i.e., type I error).

In Study 1, a sample of 298 entrepreneurs examined the effects of anchoring bias and buyer-seller effects on their perceptions of a business valuation. In Study 2, we investigated the potential existence of similarity, outcome, and gender bias among a sample of 272 legal professionals in their evaluations of business valuations and valuers. For this particular study, correlational data was used to investigate a potential indirect effect (i.e., mediation) between several variables of interest. In Study 3, a total of 363 valuation experts were surveyed to investigate to what extent cognitive biases (anchoring and so-called engagement bias) explain differences in value perceptions of the same company.

To complement the experimental studies, 30 leading valuation experts from firms across the world were surveyed. In the first part of the survey, the valuation experts were asked whether they recognized and acknowledged the research findings of Studies 1-3 (Chapter 2-4). In a second part, open interview questions were used to further probe their professional perspectives, also in relation to a proposed draft set of principles.

The quantitative data were analyzed using the statistical software package SPSS (version 23, release 23.0.0.3). As is appropriate for data acquired using EVM, (multivariate) analyses of variance (ANOVA) were used. For the mediation analyses in 0 and the moderation analyses in Chapter 2, the data were analyzed using Hayes' PROCESS macro for SPSS (Hayes, 2018). A significant advantage of Hayes' approach to, for example, Baron and Kenny's stepwise approach (Baron & Kenny, 1986) is that (1) it limits the number of analyses that need to be conducted to protect against type I errors (i.e., concluding there is an effect when in reality there is none), and that (2) it generates a single coefficient for the indirect effect (i.e., mediation effect) rather than having to derive the indirect effect from the reduction in the direct effect following the inclusion of the mediator variable in the model. For an elaborate discussion on the differences between the traditional approach to mediation analyses and alternative methods, see for example Hayes (2009).

1.4 DELIMITATIONS

The main objective of this dissertation is to gain an understanding, in the context of disputes, of the impact of cognitive biases when judging valuations and valuers by key stakeholders of a valuation such as entrepreneurs and legal professionals, and how cognitive biases affect valuers when judging another valuation on behalf of their client. Judging from the literature in social psychology, it can be established that there are numerous types of biases that may affect the way a valuation or a valuator is judged. It is, however, beyond the scope of this dissertation to investigate all types of cognitive biases that potentially might affect a stakeholder's judgment of a valuation or the valuator (i.e., first delimitation). Therefore, this dissertation focuses on specific cognitive biases in the three experimental studies

(i.e., Chapter 2., Chapter 3., Chapter 4.) which were chosen based on expert insights in the business valuation literature (e.g., Damodaran, 2019) on the one hand, and the omnipresence of investigated biases in the psychological literature on the other hand (e.g., Baron & Hershey, 1988; Firth, Lin, Liu, & Xuan, 2013; Furnham & Boo, 2011; Gardner, Titcomb, Cramer, Stroud, & Bate, 2013; Harley, 2007; Hastorf & Cantril, 1954; Hodgson & Pryor, 1984; Tversky & Kahneman, 1974).

In the context of business valuation, it is likely that biases related to the valuation input variables might influence the way stakeholders perceive and judge the valuation and the valuator. This is because of the numerous assumptions a valuator can make in the arithmetic exercise of the valuation that will ultimately result in the valuation outcome. The fact that most stakeholders often have limited technical valuation knowledge, however, suggests that cognitive biases in judging valuations and valutors probably do not stem from evaluating these valuation input variables. That said, the dissertation does not investigate possible biases amongst stakeholders that stem from biased valuation input variables (i.e., second delimitation).

Moreover, the dissertation does not aim to develop a comprehensive Statement of Principles (i.e., third delimitation). Rather, the proposed Statement of Principles in this dissertation is designed to serve as a first step towards a necessary discussion on biases in international valuation practice, and how to deal with bias to mitigate valuation disputes. Ideally, the proposed principles will serve as inspiration for professional bodies around the globe to develop their own specific principles that best serve local needs and challenges.

1.5 PRACTICAL SIGNIFICANCE

Business practice shows that business valuations are frequently part of, or result in, lengthy disputes and costly legal procedures, typically following on from widely diverging value perceptions. For example, expert insights suggest that discussions around the value and price of a company are often difficult to solve, most of the time taking many years of litigation, sometimes even up to decades (Van Solinge, 2019). With that, time, energy and money is lost at the expense of the stakeholders involved. Moreover, reputations are at stake, especially those of the business valutors. This dissertation aims to enhance our understanding of valuation disputes by exploring the role of cognitive biases when judging valuations and valutors. The current findings on the psychological factors may help increase our general understanding of conflicting value perceptions.

Additionally, a deeper understanding of the effects of cognitive biases when judging valuations and valutors by stakeholders will be advantageous for business valutors. If they are more aware that they themselves might be affected by biases, as well as their (indirect) clients when judging their work, valutors can better anticipate on biased judgments at an early

stage and subsequently limit the risk of unsatisfied clients, legal procedures and, in the most serious case, liability. Moreover, by means of the introduction of a Statement of Principles, this dissertation aims to help practice to mitigate the unwanted effects of systematic patterns of irrationality when judging valuations and valuers.

1.6 STRUCTURE OF THE DISSERTATION

The overall structure of the research is presented in six chapters, including this introductory chapter.⁹ Figure 1 shows the organization and structure of the dissertation. The first empirical study presented in Chapter 2. was conducted among a sample of entrepreneurs, a stakeholder group that can be considered as the ultimate end-user of a valuation due to the impact of a valuation outcome on their investment decision. Practice shows that entrepreneurs are assumed to have strong opinions on valuation outcomes and frequently evaluate both the valuation and the valuator. Participants of the study were asked to put themselves in the shoes of one of the two shareholders of a company who together decided to separate as their interpersonal conflict jeopardized their business's existence. In the case, an independent valuator determined the value of the shares and the participants were asked to provide their perspective on the valuation outcome. This study shows that the participants are indeed affected by biases, *inter alia*, their position (i.e., being a buyer or a seller), as well as an anchor (i.e., the valuation outcome provided).

9 Note: Study 1-3 are reported in Chapter 2-4 as stand-alone papers.

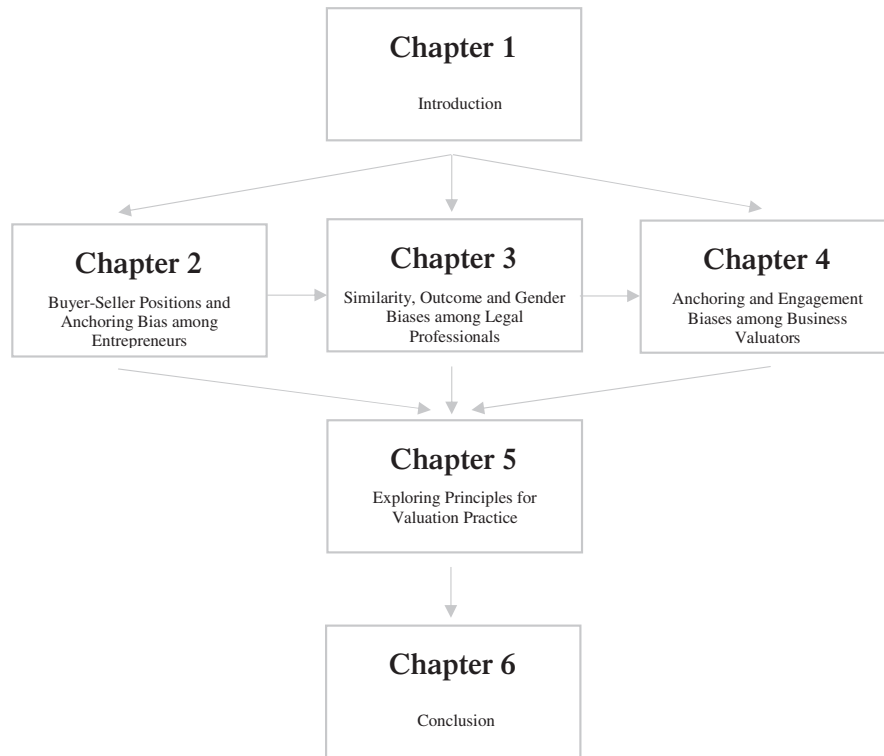


Figure 1. Structure of the dissertation.

Chapter 3. presents the second study conducted with an international sample of legal professionals, as practice shows that this stakeholder group is frequently confronted with (complex) valuation issues, for example in the context of supporting entrepreneurs in their business endeavors. Despite the fact that legal professionals are not specifically trained to assess a valuation on its arithmetical and methodological soundness, it could be assumed that they solely judge valuations on the basis of the valuator's advice about the (correct) application of the selected valuation method. However, the study shows that legal professionals' judgments of valuations and valuations are affected by the degree of perceived similarity with the valuator (i.e., similarity bias), the outcome of a deal (i.e., outcome bias), and the valuator's gender (i.e., gender bias).

Chapter 4. includes a study in which we look for explanations for conflicting views of valuations on a valuation by investigating the role of cognitive biases among a sample of business valuations from leading valuation firms. Practice shows that both inside and outside the court, valuations of the same company conducted by different valuations often vary to a high degree (see for instance the Dell case in section 1.1). This study shows that valuations are affected by, amongst others, anchoring bias (i.e., the tendency to use and adjust too little from an initial piece of largely irrelevant infor-

mation), and engagement bias (i.e., the tendency to unconsciously take a client's interests into account when forming objective judgments). Subsequently, we conducted a post-hoc study aiming to replicate these findings and to rule out the influence of valuator-dependence. This follow-up study provided further evidence for the robustness of the observed effects.

Chapter 5. reports on a consultation among a group of high profile valuers affiliated to top-tier firms around the globe. The aim of the consultation was threefold. First, the study sought to find out to what extent valuation experts recognize and acknowledge the findings of the experimental studies (as discussed in Chapter 2-4) in their own work as well as in the work of their peers. Second, it strived to perform a 'sanity check' on the studies' findings, to gain a fresh perspective on the interpretation of our own findings. Third, it served as a first exploration of whether the investigated biases can be mitigated by introducing certain 'debiasing principles' to be incorporated into the valuers' working methods.

With respect to the first two aims, the results of the consultation show that the majority of the experts recognize the findings of the three studies, with gender bias being the exception. Interestingly, of those who did not recognize biases within themselves, the majority did believe these biases could influence their peers. Regarding the study's third aim, despite some critical remarks, the respondents were generally positive towards the principles put forward. The consultation round suggests that in general, valuers have no fundamental objections to principles per se, yet the feasibility, scope and practical usability are open to debate in some cases.