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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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Citation

Broekema, M. J. R. (2020, April 1). *Cognitive bias in the judgment of business valuations and valuers : how systematic patterns of irrationality affect entrepreneurs, legal professionals and business valuers*. Meijers-reeks. Retrieved from <https://hdl.handle.net/1887/87192>

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Note: To cite this publication please use the final published version (if applicable).

Cover Page



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Issue Date: 2020-04-01

Business Valuators: Anchoring and Engagement Biases

The direction and magnitude of the bias in a valuation is directly proportional to who pays the valuator and how much that valuator is paid.

– Aswath Damodaran –

Business valuations of the same company made by different valuers frequently diverge significantly, often resulting in capital destroying disputes. Previously, the valuation literature sought to explain and resolve diverging views predominantly in the valuation itself and in economic theories, or the valuator's skills. In contrast, our study shows the importance of recognizing the psychological aspects that affect value perceptions. With the goal of increasing valuation 'fairness' and minimizing disputes, we aimed to find an explanation for valuation disputes by investigating the role of cognitive biases in valuers' judgments of valuations. Across two studies (N=363), we found evidence for the notion that valuers are influenced by anchors (i.e., anchoring bias) and their clients' interest (i.e., engagement bias; being affected by a client's interests when forming judgments, or in this case, conducting valuations) when judging the value of a company. Specifically, both anchoring bias and engagement bias manifest themselves when judging valuations by valuers. Consequences of these biases in valuation practice can include suboptimal investment decisions and advice, possibly resulting in causing or extending discussions around valuation outcomes that ultimately can degenerate into lengthy and costly disputes. These findings cast doubt on the notion of fair value in business valuations.

4.1 INTRODUCTION

People want to be informed on the value of a company or an equity interest therein for many reasons. Consider, for instance, a company that wants to acquire another company, sell a subsidiary, or one following a divestment strategy. In these situations, an informed investment decision has to be made, in most cases based on the (economic) value of the relevant company. Not only in situations of buying and selling companies is it important to be well-informed on a company's value, also in situations where shareholders have a dispute and want to separate, or when a company experiences financial distress and its shareholders are requested to provide additional equity, does valuation play a prominent role. Hence, valuations often take center stage in many business transactions. The widely respected investor Warren Buffett once said "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.” (Buffet, 2012).

In most situations, value is derived from expectations regarding a company’s or asset’s future earnings, because the acquirer or investor will have to recoup his/her investment in the future. Therefore, valuation theory is predominantly based on the concept of interest, and on capitalizing or discounting future earnings (Edwards & Warman, 1981; Fisher, 1907, 1930; Parker, 1968; Rutterford, 2004). In sum, a dollar today has a higher value than a dollar received tomorrow. Not only corporate finance specialists such as business valuers embrace this valuation concept, also judicial authorities, such as the U.S. Supreme Court, state in many decisions that the value of a company depends on expected future earnings (Dukes, 2001). Although there are different valuation methods (e.g., Brealey, Myers, & Allen, 2014; Damodaran, 2006; Dukes, 2001; Fernández, 2007; Hitchner, 2011; Koller, Goedhart, & Wessels, 2015), a widely accepted and preferred valuation method that takes into account expected future earnings is Discounted Cash Flow (i.e., DCF; see for example Dittmann, Maug, & Kemper, 2004; Fernández, 2004, 2007; Mukherjee, Kiymaz, & Baker, 2004; Pereiro, 2002). This concept gained momentum decades ago partly due to the development of capital budgeting in the US and in Europe (Dulman, 1989). The DCF-method has different variants¹ and consists of two main variables. The first variable concerns the company’s estimated future earnings, predominantly expressed in the free cash flows.² The second variable concerns the ‘discount rate’ that reflects the riskiness of the estimated free cash flows. When these two variables are known, the application of a relatively simple but profound equation calculates the present value of a company. A generally accepted definition of free cash flows is cash that is not required for operations or reinvestments (Brealey et al., 2014; Jensen, 1986) and therefore available (i.e., free) after funding the necessary investments required to generate the future free cash flows. These will then be discounted to their net present value at a discount rate that reflects the risk of the free cash flows and serves as a compensation for investing under conditions of uncertainty (Miller & Modigliani, 1961; Modigliani & Miller, 1958).

The DCF-valuation methodology is, at first sight, a simple and elegant solution to calculate the future value of a company discounted to its present value. However, practice shows that when two or more business valuers value the same company (assuming all things are equal), different valuation outcomes can emerge.³ Minor differences in valuation outcomes are

1 For example: WACC (Weighted Average Cost of Capital), APV (Adjusted Present Value), CFE (Cash Flows to Equity), or FCF (Free Cash Flows to the Firm).

2 For the purpose of this research we consider a company as a whole and not an individual asset or a group of assets.

3 The Dell case, as described in Chapter 1. is a good example of this (*Memorandum Opinion: In re Appraisal of Dell Inc.*, 2016). *In re Appraisal of Dell Inc.*, No. 9322-VCL, 2016 WL 3186538, at *1-114 (Del. Ch. May 31, 2016).

to some extent inevitable due to the application of different assumptions in the valuation framework and are generally accepted as an inherent consequence of using the DCF-method. Large differences, on the other hand, can be problematic and difficult to explain. Extensive disputes around valuation outcomes are frequently not beneficial to the financial performance of a valuation object and, ultimately, the object's value can be affected by the time and attention a dispute demands. Additionally, strong deviations in assumptions may result in an under or overvaluation of a company which influences the quality and soundness of investment decisions (e.g., buy or sell), as well as contributing to potential capital destruction. Hence, in an ideal world, differences in valuation outcomes are minimized. Therefore, in order to be able to mitigate large differences in valuation outcomes, the ultimate question is: what causes these differences in valuation outcomes? One cause that has been put forward is that when applying a DCF-method, valuers disagree on how to estimate the parameters and inputs (i.e., cash flows and the discount rate) of the valuation due to a lack of clear guidelines (Bancel & Mittoo, 2014). Additionally, there is a lack of consistency in the valuation process (Dukes, 2001). As a result, differences in estimations can arise both in the projected cash flows and in the individual elements of the discount rate, possibly resulting in an under or overestimation of a company's value, which is then disputed. However, it is unlikely that large differences in valuation outcomes (such as in the Dell case; Chapter 1.) can solely be accounted for by these issues, which is why we consider the further exploration of potential causes of large differences in valuation outcomes and subsequent disputes as something worthwhile.

The focus of this study is the potential influence of human biases. Considering the inherent complexity of valuations, the lack of clear guidelines, as well as the time-pressure under which valuations are usually conducted (conditions that allow for biases to emerge; Tversky & Kahneman, 1974), we expect that valuers are vulnerable to the influence of cognitive biases. Valuation experts have long argued that valuations are indeed inherently biased (e.g., Damodaran, 2009, 2017), primarily with respect to the valuation input variables. Surprisingly, however, despite the numerous studies that have been conducted investigating the role of heuristics and biases in judgment and decision making in a wide range of (financial) contexts, the valuation domain has (to our knowledge) not yet been subjected to this type of research.

4.2 THEORY AND HYPOTHESES

Heuristics and biases in finance

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, has found ample empirical support. In the early seventies of the last century, Tversky & Kahneman

(1974) revealed the powerful effects of heuristics and biases on human judgments, particularly in situations characterized by high degrees of complexity and uncertainty. In such situations, biases can unconsciously influence perceptions of reality and expectations regarding the future.

The effects of heuristics and biases in financial decision making are well documented. For example, it has been established that financial decisions are plagued by overconfidence on behalf of decision makers (e.g., Ferris, Jayaraman, & Sabherwal, 2013; Ho, Huang, Lin, & Yen, 2016), that investment strategies are typically affected by over optimism (e.g., Wang, Sheng, & Yang, 2013), and that the similarity between start-up teams and venture capitalists can affect the latter's investment decisions so that teams that are perceived as more similar are more likely to receive funding (Franke et al., 2006; Murnieks et al., 2011), just to name a few. Studies such as these have contributed to the emergence of the behavioral finance research field. This subfield of behavioral economics focuses on investigating irrational behavior in financial markets and consumer finance resulting from systematic human errors (Baker & Wurgler, 2013; Barberis & Thaler, 2003; Shiller, 2003; Thaler, 2005). Hence, the idea that humans can act in a systematically irrational manner when dealing with complex financial matters is well established.

Biases in business valuation

To our knowledge no empirical research has been conducted investigating the influence of biases on business valuations. This gap is surprising considering (1) the large number of studies conducted on biases in other areas of financial decision making, and (2) the central role that the concept of economic value plays in corporate disputes, mergers and acquisitions, and other investment decisions. In our study, we investigate the potential influence of two biases. The first is the anchoring and adjustment bias, which entails the tendency to use an initial piece of information as an (possibly irrelevant) anchor and subsequently insufficiently adjusting away from that anchor. For example, in the context of business valuation, a valuator may start a valuation after the value for a certain valuation object has been determined by another party; this could be an entrepreneur who wants to sell his/her business for a certain amount, or even another valuator who has already conducted a valuation and requires a second opinion. In these situations, it is possible that the initial figure mentioned serves as an anchor, causing valuers to be biased and to value a company in line with that anchor.

The second bias under investigation in this study is a bias we call "engagement bias", which entails the possibility that valuers (or any professional for that matter) are affected in their judgments as a result of their clients' interests. For example, if a valuator is hired by an investor looking to acquire a company and the investor ideally wants to pay as little as possible, the valuator could then value the share price lower to meet the expectations of the valuator's client. Likewise, if a valuator is hired to value a company

by the owners who are looking to sell the company, and therefore have a clear interest in a high valuation, this could cause a valuator to increase the valuation in line with his/her clients' interests.

Anchoring and adjustment bias

The anchoring and adjustment bias, also called the anchoring effect or anchoring bias, is usually conceptualized as the intuitive tendency of humans to use an initial piece of predominately insufficient and irrelevant information when formulating their final judgment (Tversky & Kahneman, 1974). This bias consists of both an anchoring effect (i.e., a final estimate set against an anchor) and an adjustment effect (i.e., the adjustment to the initial value) (Epley & Gilovich, 2006). Once the anchor is presented, humans tend to adjust insufficiently away from the anchor, resulting in judgments that are closer to the anchor than in the absence of that anchor (Heywood-Smith, Welsh, & Begg, 2008; Russo & Schoemaker, 1992; Tversky & Kahneman, 1992).

In their seminal paper, Tversky and Kahneman (1974) asked participants in an experiment to estimate (among other things) the percentage of African countries in the United Nations (UN). By spinning a wheel of fortune, participants were first presented with a number between 0 and 100 and were asked to indicate whether or not the number determined by spinning the wheel was higher or lower than their estimate of the percentage of African countries in the UN. Next, the participants were requested to adjust the number generated by the wheel of fortune upwards or downwards to arrive at their estimate of the percentage of African countries in the UN. The results showed that the arbitrary numbers (from spinning the wheel) had an effect on the participants' estimates, such that if the wheel landed on 10 the average estimate was 25% while if the wheel landed on 60 the average was 45%. Hence, even with full awareness of the randomness and irrelevance of the numbers generated by the wheel of fortune, participants' estimates were still affected by these anchors.

Since their study, extensive research has been conducted on anchoring bias and the evidence across different contexts suggests it is one of the most robust biases (for a review, see Furnham & Boo, 2011). Importantly, the anchoring bias is not limited to generic, or lay-people's judgments. Rather, research has shown that professionals are also affected by anchoring bias when making judgments relevant to their respective fields. For example, a typical finding among legal professionals (e.g., judges or mock juries) is that when they have to decide on the sentencing of the accused, they are affected by the sentencing demands expressed by the prosecutor, resulting in higher sentences being given following a higher demand (all else being equal; Englich, 2006; Englich & Mussweiler, 2001). This anchoring effect in legal judgments was found even when the sentencing demands (i.e., the anchors) came from an irrelevant source or were randomly determined by the participating legal experts through rolling dice (Englich, Mussweiler, & Strack, 2006). Similar anchoring effects have been found with respect to

awarding punitive damages. That is, the higher the requested amount (i.e., the anchor), the higher the awarded damages (Hastie, Schkade, & Payne, 1999).

In addition to legal professionals, financial professionals have also been shown to succumb to the effects of anchoring bias. For example, when financial market professionals were asked to estimate long-term stock returns, their judgments were affected by the initial starting value which served as an anchor. This effect was independent of the level of expertise of the respective investor (Kaustia et al., 2008). Moreover, auditors have also been shown to be affected by anchoring bias when judging the reasonableness of book values resulting from unaudited book values of which accountants are typically aware and which can serve as an anchor (Kinney, Jr., & Uecker, 1982; for further evidence of anchoring bias among financial professionals, see Liao, Chou, & Chiu, 2013). Hence, it appears that both lay people and experts can be affected by anchoring bias.

Importantly, however, some research indicates that professionals in settings familiar to them rely less on anchors in their judgments. For example, Kaustia et al. (2008) found that financial professionals were less affected by the initial value of stocks (i.e., the anchor) when estimating long-term stock returns than were students. Likewise, Wilson, Houston, Etling, & Brekke (1996) found that people with more knowledge of a particular subject matter were less susceptible to anchoring bias. Thus, although the majority of research suggests being an expert in a certain field is insufficient to be protected from anchoring effects, there is some evidence for the contrary. Therefore, it is relevant to explore to what extent business valuers, as experts in their field, are affected by anchoring bias.

Business valuers (consciously or unconsciously) face an anchor in many different situations. For example, when a business valuator is hired by one of the parties in a shareholder's dispute and is informed on the valuation conducted by the counterparty against which the valuator's client objects, the valuation of the counterparty can serve as an anchor. Likewise, when a business valuator is requested to value a company that his/her client wants to acquire and informs the valuator about the maximum price he is willing to pay, the maximum price mentioned by the valuator's client can serve as an anchor. In another example, when a court requests a business valuator to determine the economic damage as a result of an unlawful act by one of the parties and the business valuator is informed about the amount the claimant had requested, that initial amount can serve as an anchor.

Hence, business valuers frequently operate under conditions in which they are confronted with an anchor, which may then affect their judgment. Notwithstanding the research pointing towards an expert effect that might offer some protection against anchoring effects, based on the robustness of the anchoring bias and its presence in a variety of domains, we suspect that valuers are affected in their judgments by the anchoring bias. Therefore, we formulated the following hypothesis:

Hypothesis 1: Valuers are affected by anchoring bias when judging the value of a company so that they determine a higher value following a high anchor and a lower value following a low anchor.

Engagement bias

Competition between professionals to attract and retain clients can be fierce. Consequently, in order to sustain good relationships with their clients, professionals' continuous pursuit to achieve their clients' satisfaction is not unusual. It is thus plausible that professionals' drive to satisfy clients jeopardizes professional autonomy and unconsciously affects supposedly unbiased and objective judgments. When business valuers (or any professionals) are consciously or unconsciously affected in their judgments to favor their clients' interests, we call this engagement bias.

Acknowledging the risk that valuers might be susceptible to engagement bias is important for the valuation practice, as the possibility exists that clients' interests are somehow factored into business valuations at the expense of focusing solely on valuation theories and the principles of the profession. Similar to other professionals in service industries, business valuers support a variety of clients for different purposes and are exposed to their demands, wishes, and desires. For example, a valuator who is engaged by a prominent client for the first time and is determined to demonstrate his/her capabilities, or a valuator who is promised a follow-up assignment by a client conditional on the success of the current engagement; in both situations their clients' interests might affect valuers' judgment.

Even though the empirical evidence for the existence of engagement bias is practically non-existent, there is reason to believe that professionals weigh their clients' interests at the expense of their professional judgment. For example, following from, among other things, the public debate about the dependence of auditors on their clients, auditors are currently more closely monitored by supervising bodies to prevent them from taking their clients' interests into account. This increased monitoring and the mandatory rotation of audit firms is a consequence of a sequence of auditing scandals where auditors were blamed for tarnishing their responsibilities and their role in society and business by weighing their clients' interests too much in audits. Such measures suggest there is a concern that professionals are biased in their judgments due to their focus on achieving customer satisfaction.

In addition to the indirect evidence for engagement bias among auditors, there is also more direct evidence for this in financial judgments. A recent study investigated whether business relations between mutual funds and brokerage firms influences sell-side analyst recommendations (Firth, Lin, Liu, & Xuan, 2013). The researchers found that brokerage firm analysts' stock recommendations are in fact higher if the stock is held by mutual fund clients of the brokerage firm. Interestingly, this phenomenon strengthened when the weight of the stock in the mutual fund clients' portfolio increased and also when the amount of trading commissions paid by the mutual fund

clients increased. In addition, analysts were less willing to issue a negative rating on a stock after a bad news event if these stocks were held by their firm's mutual fund clients. Importantly, however, this clear engagement bias was reduced when a particular stock was highly visible to other mutual fund investors, suggesting a conscious and strategic use of analyst recommendations. Indeed, analysts appear to be biased resulting from their mutual fund clients' interests, and therefore disclose above average optimistic ratings of their clients' stock portfolio. Thus, evidence suggests that financial professionals might be biased in their judgments resulting from the dependent relationships between them and their clients.

Whether this also holds true within the context of business valuation is a relevant question. Therefore, based on the above, we formulated the following hypothesis:

Hypothesis 2: Valuers are affected by engagement bias when judging the value of a company so that they value a valuation object in accordance with their clients' interests.

4.3 OVERVIEW OF THE STUDIES

We set out to investigate the extent to which business valuers are affected by anchoring bias and engagement bias. The hypotheses were tested in two studies. Study 1 tested the two hypotheses among an international sample of business valuers from leading valuation firms. An experimental study design was used in which participants were assigned to a particular condition that detailed a compressed valuation case. Specifically, participants were either assigned to the condition in which they represented the buyer or the seller in a transaction, and in which they were presented with either a high or low anchor. Hence, there were four different experimental conditions (i.e., buyer/low anchor, buyer/high anchor, seller/low anchor, seller/high anchor). All other aspects of the case were kept constant across the conditions. This experimental research design enables us to isolate the specific influence of the manipulated variables (i.e., client, anchor). In the case, participants were asked to provide a second opinion on an existing valuation report presented in a compressed manner. A compressed valuation report was chosen as it was unfeasible to ask participants to conduct a full valuation themselves, or to assess a full valuation report considering the time constraints imposed by limitations in participants' availability. Nonetheless, conducting second opinions is common practice in the valuation industry and often a first step to an in-depth valuation analysis. In Study 2, a post-hoc study, study 1 was replicated, but with a minor change – the valuation was conducted by an independent valuator – to ascertain that valuator-dependence did not influence the initial findings (i.e., examine the robustness of the observed effects in study 1).

4.4 STUDY 1

4.4.1 Methods

Participants

For this study, 203 business valuation specialists were recruited via e-mail. We targeted the world's leading valuation and corporate finance firms to ensure a sample of highly experienced business valuation experts. For 17 participants, no data was recorded as they failed to pass an attention check, leaving a final sample of 186 participants. Of the final sample, 165 were male (81.3%), the average age was 46.4 ($SD = 13.2$), and the average years of experience in their profession was 17.9 ($SD = 10.7$). Further, 85 (45.7%) had a post-master's degree in accounting, 160 (86.0%) were enrolled or had been enrolled in a specialized business valuation course, and 123 (66.1%) had a post-master's degree in business valuation. When asked about their primary focus in their work, 113 (60.8%) indicated that business valuation was the primary focus, 57 participants (30.6%) answered M&A, and 16 participants (8.6%) answered accounting; 175 participants (94.1%) indicated that they conduct or are involved in business valuations on a regular basis.

In total, 28 different nationalities are represented in the sample. The five countries with the most participants are the United States with 58 participants (31.4%), the Netherlands with 43 (23.3%), Canada with 23 (12.4%), Italy with 10 (5.4%), and South Africa with 8 participants (4.3%). A complete overview of the participants' nationalities can be found in Appendix C1. For 107 participants (52.7%), English was their native language. The non-native English speakers indicated on a 7-point Likert scale whether they understood the questions and experienced no difficulties in answering the questions, ranging from "Strongly disagree" (1) to "Strongly agree" (7). The average score was 6.32 ($SD = 0.97$).

Experimental Design and Variables of Interest

We used a 2 x 2 between-subjects factorial design, with Anchor (low value anchor vs. high value anchor) and Client (seller vs. buyer) as factors; the participants were randomly assigned to one of the four conditions. All participants were presented with the business case and summary of the corresponding valuation report. They were asked to give their opinion on the case and, most importantly, on the valuation outcome. In the low value anchor condition, the value of the company as determined by a DCF-analysis was presented as EUR 4.435 million and EUR 14.324 million in the high value anchor condition. Additionally, participants were assigned to either the role of the valuator representing the buyer in the transaction, or of the valuator representing the seller.

The dependent variables (i.e., the key variables of interest which are hypothesized to be affected by anchoring bias and engagement bias) were first and foremost the extent to which participants would adjust the

valuation upwards or downwards, expressed both qualitatively and quantitatively. Specifically, participants were asked to what extent they would adjust the valuation upwards or downwards (e.g., “heavily downwards” or “somewhat upwards”). In addition, they were asked to quantify the range within which they believed the true value of the company to be, as well as whether they perceived a decline of the business and to what extent they would recommend their client to go on with the transaction. In total, four dependent variables were thus used in the study (see Materials and Measurements).

In addition to these dependent variables measuring the adjustment of the valuation, two other dependent variables were included for exploratory reasons. First, we measured participants’ perceptions of the degree of decline that the business in the case was facing (i.e., “perceived decline”). This variable was incorporated to see whether a certain anchor or a client’s interests could affect a valuator’s perception of the state of a business. If a valuator’s client was aiming to buy shares and would therefore benefit from a low value of the shares, would a valuator then judge a business’s decline as more severe (i.e., resulting in a lower value of the shares) than when a valuator’s client was aiming to sell shares and would therefore benefit from a higher value of the shares? The second variable pertained to whether the participants would, given the initial valuation outcome stated in the report, recommend their client to go forward with the transaction. This variable examined whether the valuation outcome and the client’s interest were important drivers of their final recommendation.

Procedure

The procedure for the survey was the same for all participants. Participants were first presented with a brief introduction stating that the purpose of the survey was to investigate judgment and decision-making processes in the context of business valuation. Anonymity was emphasized as well as the fact that there were no right or wrong answers and that we were solely interested in the participant’s perspective on the case and valuation report. Next, participants were asked to answer questions aimed to measure their locus of strategic control, which is the extent to which participants believe the success of a company is a matter of luck or the result of factors beyond an entrepreneur’s control (i.e., external locus) or rather that success is a matter of careful strategic planning and that luck has nothing to do with it (i.e., internal locus). The locus of strategic control scale was incorporated because research has shown that this factor is correlated with perceived decline (Musteen, Liang, & Barker, 2011) and we wanted to control for this.

Participants were then presented with the business case followed by an attention check to make sure sufficient time was spent going through the case and the instructions. Before the attention check, it was stressed that participants could not move backwards to previous sections of the survey and that if they wanted to have access to the case later on they

could click on a link that would open the case as a PDF file in a separate window. If the attention check was completed successfully, participants were given the assignment as well as a summary of the valuation report. Before participants were asked about their opinion on the valuation report, they answered several questions to measure the perceived decline of the business. They were then asked to give their opinion on the valuation outcome and to indicate whether they would adjust the valuation upwards or downwards (measured on a 7-point Likert scale) and in which range they believed the true value of the company laid. These three variables (i.e., degree of adjustment, lower bound of the range, upper bound of the range) served as the key dependent variables.

The participants then could indicate which elements of the valuation report they believed needed to be adjusted. Underneath each valuation element, a text box was included in which participants were asked to motivate their decisions regarding their adjustment of the valuation outcome. Next, they were asked whether or not they would recommend their client to do the transaction at the value indicated in the valuation report. The final two questions regarding the case aimed to measure 'bias blind spot', i.e., the tendency to recognize and acknowledge biases affecting other people's judgments, while failing to recognize the potential influence of biases in their own judgments (Pronin, Lin, & Ross, 2002). The participants then indicated whether English was their native language and, if not, to what extent they understood the case and subsequent questions. Finally, participants were presented with several demographical questions as well as questions about their professional background.

Materials and Measurements

Business case. Participants were given a brief introduction to the case and their role in it. For all participants these were:

"You will be presented with a real-life case of a company in decline that requires new capital to perform a turnaround. A private equity firm (hereafter: 'PE firm') is interested in investing in this company, which should provide sufficient capital to perform a turnaround. The question now is: what is the value of the company?"

In the "seller" condition, the instructions then continued with:

"To determine the value of the Company, the PE firm hired a valuator. The management of the Company, however, believes the resulting valuation is way too low and suspects the PE firm wants to buy new shares cheap and is too skeptical about the Company's future as reflected in its forecast and underlying assumptions. Therefore, the Company wants to hire a valuator themselves for a quick, high level review. That valuator is you. Please try to really put yourself in the shoes of the valuator that is hired by the Company to have a critical look at the forecast and assumptions made by the PE Firm, as your client (the Company) believes the valuation is too low."

In the “buyer” condition, the instructions continued with:

“To determine the value of the Company, the management of the Company hired a valuator. The PE firm, however, believes the resulting valuation is way too high and suspects the management of the Company is too optimistic about the Company’s future as reflected in its forecast and underlying assumptions. Therefore, the PE firm wants to hire a valuator themselves for a quick, high level review. That valuator is you. Please try to really put yourself in the shoes of the valuator that is hired by the PE firm to have a critical look at the forecast and assumptions made by the Company, as your client (the PE firm) believes the valuation is too high.”

For all participants, the instruction ended with:

“The case is described in a somewhat concise manner and is aimed towards simulating a situation in which you are approached last minute for a quick, high level review and have limited time and information.”

Hence, after the instructions it should have been clear for the participants who their client was (i.e., the Company or the PE-firm), what their client’s opinion was regarding the valuation conducted by the other party (i.e., too high if their client was the PE-firm and too low if their client was the Company), and that they were going to be asked to provide a high-level review of the valuation report made by the other party.

The participants were then given the full case describing a Dutch advertising and marketing agency (“Flagship”) that created large scale marketing campaigns for reputable brands. The company was owned by two shareholders, managed by the CEO, and each shareholder delegated a supervisory board member. As a result of declining sales and increasing costs, both the operating result and net income of the company were negative. The company had struggled to make the transition towards online and technology driven product offerings, for a large part due to its outdated image. As a result, the company would soon face bankruptcy. It was evident the company required new capital to finance a turnaround, but both shareholders had already invested substantially in the past and no longer had access to funds. Therefore, alternative financing options were explored and through a reputable M&A advisor, a private equity firm expressed interest in investing in the company as a third shareholder. The company was reluctant to accept a significant dilution of their interest resulting from issuing new shares but was warned that the PE firm would want to acquire a significant percentage of shares. Regardless, both parties (i.e., the company and the PE firm) agreed that a strong turnaround plan needed to be developed. The CEO and his team defined a roadmap to profitability by increasing sales, reducing costs, efficient management of working capital, and making (catch-up) investments (i.e. operational expenditures).

Here, the first part of the case ended. The details of the turnaround plan as well as the full case can be found in Appendix C2.

Attention check. Considering the importance for the current study that participants knew exactly who their client was and what their client's opinion was regarding the valuation outcome, we incorporated an attention check. Three simple multiple-choice questions were posed: (1) Who is your client, (2) In what industry does the Company operate, and (3) What is your client's opinion regarding the valuation outcome? If the participant answered one or more questions incorrectly, they were offered a second chance to read the case. After the second reading, participants were again presented with the same three questions. If all three were answered correctly, participants could continue with the survey. If one or more of the questions was again answered incorrectly, participants were informed they could not continue.

Assignment. After having read the case and successfully completing the attention check, participants were presented with the second part of the case, which contained the assignment and the valuation report. For participants in the "seller" condition, the assignment read as follows:

"To evaluate the possible investment of GEP (i.e., the PE-firm) and to anticipate on a possible discussion of the share price, GEP hired a valuation firm to conduct a DCF-valuation of the Company, taking into account the effects of the turnaround plan. This valuation is not only of importance to the investment committee of GEP but anticipates as well on the percentage of shares they can receive as a result of a possible equity contribution to the Company. The valuation outcome is [low value anchor vs. high value anchor] and is being shared with the Company under disclosure. By clicking on this link (PDF file), a summary of the valuation report is accessible. In this case, the enterprise value is equal to the shareholder value.

On behalf of the shareholders of the Company, you are being asked to give a quick, high level review of GEP's valuation and their corresponding valuation assumptions. You are informed that the Company representatives, including the SB [Supervisory Board]-members by means of Hofmann and Van Buuren, disagree with the valuation outcome as they consider the outcome to be way too low, and as a representative of the Company's interests, your assignment is to perform a critical and professional review of the valuation. You are aware that the Company hopes that your assessment of the calculated value of the Company is more in line with their own expectations."

For participants in the "buyer" condition the assignment read as follows:

"To evaluate the possible entrance of GEP as a new shareholder and to anticipate a possible dilution discussion, the Company hired a valuation firm to conduct a DCF-valuation of the Company, taking into account the effects of the turnaround plan. This valuation is also the legitimacy for the shareholders of the Company to accept a certain level of dilution. The valuation outcome is [low value anchor vs. high value anchor] and is being shared with GEP under disclosure. By clicking on this link (PDF file), a summary of the valuation report is accessible. In this case, the enterprise value is equal to the shareholder value.

On behalf of the investment director of GEP, Jeffrey Hin, you are being asked to give a quick, high level review of the Company's own valuation and their corresponding valuation assumptions. You are informed that Jeffrey Hin disagrees with the valuation outcome as he considers the outcome to be way too high and as a representative of GEP's interests, your assignment is to perform a critical and professional review of the valuation. You are aware that GEP hopes that your assessment of the calculated value of the Company is more in line with their own expectations."

Valuation report. We chose to only include the key elements of the valuation rather than a full report, and to frame the assignment as a quick, high level review primarily due to the participants' time-constraints. That is, it would not have been feasible to ask participants to generate or assess a complete valuation report from scratch as this would require a large commitment. Nonetheless, the current set-up of a high-level review based on an existing valuation report represents a realistic scenario with which professional business valuers are frequently faced. The generalizability of the current context to a situation in which a valuator conducts a full valuation from scratch is addressed in the general discussion.

The valuation resulted in either EUR 4.435M (low value anchor condition) or EUR 14.324M (high value anchor condition). Each report included (1) a P&L statement, (2) an overview of net working capital, (3) and an overview of tangible fixed assets and investments. All three were done for the past four years (2014-2017) and forecast for the next seven years (2018-2024). Additionally, a balance sheet was included, an overview of the cost of capital, the main valuation assumptions, a graph depicting the net sales and EBITDA over the 2014-2024 period, and the final DCF analysis. The graph of the low value anchor report depicted a moderate increase in sales and EBITDA, whereas the graph for the high value anchor report showed a typical 'hockey stick' projection with steep increases in sales and EBITDA. The full valuation reports presented to the participants can be found in Appendix C3 (low value anchor) and Appendix C4 (high value anchor).

Dependent variables

Valuation adjustment. Participants were asked to indicate on a 7-point Likert scale to what extent they would adjust the valuation outcome upwards, downwards, or keep the outcome as is. The scale ranged from "Adjust heavily downwards" (1) to "Adjust heavily upwards" (7), with the midpoint (4) labeled as "Remain as it is".

Valuation range. Realizing it is difficult to provide a specific adjustment of the valuation, we asked participants to indicate a range within which they believed the enterprise value of the Company laid. Participants used two sliders to indicate what they believed the minimum value should be (slider 1) and what the maximum valuation should be (slider 2). Both sliders had a maximum range of EUR 0-20M and were presented on the same screen. The lower bound of the range (i.e., the minimum value) and the upper bound of the range (i.e., the maximum value) each served as a separate dependent variable.

Perceived decline. Seven questions (Appendix C5) aimed to capture the perceived decline of the business and included items such as “Despite the poor performance of the last few years, Flagship has the means to resolve the challenges presented by its environment” and “Flagship will likely fail any day and declare bankruptcy”. Participants answered on a 7-point Likert scale ranging from “Strongly disagree” (1) to “Strongly agree” (7). Items were recoded so that a higher score indicated the participants perceived the decline as more severe. The seven items were derived from the 18-item scale used by Musteen et al. (2011), which the authors largely based on the work of Jackson and Dutton (1988). The Cronbach’s alpha in the Musteen et al. (2011) study for all 18 items was .75. In our study, Cronbach’s alpha for the seven items was .74.

Recommendation. Participants were asked to what extent they would recommend their client to do the transaction at the value listed in the valuation report. Participants answered on a 7-point Likert scale ranging from “Definitely not” (1) to “Definitely yes” (7).

Control variables

Gender. Considering the unequal distribution of males and females in the sample (165 men, 21 females), gender was entered as a control variable to account for any differences.

Locus of strategic control. The locus of strategic control scale was incorporated as research has shown that this factor predicts perceived decline (Musteen et al., 2011). Similar to the Musteen et al. (2011) study, we based the locus of strategic control items on work by Hodgkinson (1992) who created and validated this scale (see also Ritchie, Anthony, & Rubens, 2004; Ritchie & Sherlock, 2009). However, instead of the 16 items used in these previous studies, we included 10 items in our scale, selected based on the fit with the current context, to reduce the time required to complete the scale. The scale included items such as “Market opportunities in an industry are largely determined by factors beyond a company’s control”, or “Many of the problems experienced by businesses can be avoided through careful planning and analysis” (Appendix C6). Participants answered on a 7-point Likert scale ranging from “Strongly disagree” (1) to “Strongly agree” (7). Items were recoded so that a higher score indicated a more external locus of strategic control.

Musteen et al. (2011) obtained a Cronbach’s alpha of .72, whereas our sample’s internal consistency was .51. An exploratory factor analysis identified three factors based on Eigenvalues above 1. Combined, these three factors explained 34% of the variance. However, the items belonging to the three factors did not clearly represent subcomponents of locus of strategic control, which is why we averaged all the items as a single scale. In previous research, all items were also used to represent a single scale. Still, given the low internal consistency it remains uncertain whether combined the items measured a single construct. Hence, results pertaining to this control variable should be interpreted with caution.

Maturity. Another variable associated with perceived decline is maturity; defined as a combination of age, experience and whether or not someone was pursuing an executive MBA (Musteen et al., 2011). We included both age and experience as separate control variables.

Variables used for additional analysis

Valuation components. Below the sliders used to indicate the valuation range, participants were presented with a list of eight components of the valuation report and were asked to indicate which elements they believed needed to be adjusted. Participants had to indicate at least one, but could choose more than one option. The eight elements were: (1) net sales, (2) EBITDA, (3) CAPEX, (4) net working capital, (5) cost of capital, (6) the length of the forecast period, (7) residual value, and (8) “other”.

Bias blind spot. Participants were asked whether they believed the valuator hired by the opposing party was affected in his/her judgments because of their client’s interests (0 = yes, 1 = no), and whether they believed they themselves were affected in their judgment because of these interests (0 = yes, 1 = no).

4.4.2 Results

Data Preparation

Considering the importance of reading the case thoroughly and having a good understanding of the business’s current situation and future prospects, participants who spent less than 45 seconds reading the case were excluded from analyses. Reading the case consisting of 648 words within 45 seconds would require a reading speed of 21.2 standard deviations (1 $SD = 30$ words/minute) above the average reading speed ($M = 228$ words/minute) in the English language (Trauzettel-Klosinski & Dietz, 2012). As a result, 7 participants were excluded from further analyses, leaving a final sample of 179.

Anchoring and Engagement Bias

First, we conducted a Multivariate Analysis of Covariance (MANCOVA). The variables anchor (low vs. high value) and client (seller vs. buyer) were entered as independent variables, and gender, age, years of experience, and locus of strategic control as control variables. For the dependent variables we included the valuation adjustment, valuation range (lower bound and upper bound as separate variables), perceived decline, and the final recommendation.

Table 7. Pearson correlations for the independent variables, dependent variables, and control variables of Study 1 (N=179).⁴

	M	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Anchor (0 = Low, 1 = High)			-	-.01	-.07	.48**	.67**	.02	.04	.06	.00	-.04	.03
2. Client (0 = Buyer, 1 = Seller)				-	.50**	.30**	.31*	-.07	.75**	.17*	-.06	-.06	-.08
3. Adjustment	2.53	1.29			-	.50**	.49**	-.23**	.32**	.14	-.07	-.07	.04
4. Value lower bound	4.04	3.72				-	.78**	-.23**	.28**	.13	-.10	-.08	-.07
5. Value upper bound	6.92	4.65					-	-.16*	.28**	.13	-.09	-.11	.06
6. Perceived Decline	4.48	0.82						-	-.06	-.14	.12	.10	.08
7. Recommendation	3.62	2.09							-	.15*	-.10	-.07	-.06
8. Gender (0 = Male, 1 = Female)										-	-.13	-.11	-.07
9. Age	46.17	12.86									-	.84**	.03
10. Experience	18.09	10.65										-	-.00
11. Locus of Strategic Control	3.15	0.58											-

Results showed that there were significant main effects for anchor, $F(5, 167) = 72.30, p < .001, \eta_p^2 = .68$, and client, $F(5, 167) = 56.87, p < .001, \eta_p^2 = .63$, as well as an interaction effect between these two variables, $F(5, 167) = 2.97, p = .014, \eta_p^2 = .08$. Table 7 shows the Pearson correlations for the included variables, and Table 8 shows the results of the MANCOVA.

Table 8. Results of the MANCOVA of Study 1.

Independent Variables	$F(5, 167)$	p	η_p^2
Anchor	72.30	<.001	.68
Client	56.87	<.001	.63
Anchor * Client	2.97	.014	.08
Control variables			
Gender	0.61	.69	.02
Age	0.63	.67	.02
Experience	0.43	.83	.01
Locus of Strategic Control	1.73	.13	.05

Note: the dependent variables were perceived decline, valuation adjustment, valuation range (lower and upper bound as separate variables), and the final recommendation.

4 Values for age and experience (M and SD) differ from those reported under section 4.4.1. (Participants), as seven participants were excluded from the analyses.

Subsequent univariate analyses showed that the main effect for anchor was only significant for the variables measuring the lower bound of the value range, $F(1, 171) = 60.62, p < .001, \eta_p^2 = .26$, and the upper bound of the value range, $F(1, 171) = 181.19, p < .001, \eta_p^2 = .51$. Specifically, participants in the low value anchor condition gave a lower value for the lower bound of the value range ($M = 2.26, SD = 1.48$) than participants in the high value condition ($M = 5.83, SD = 4.40$). The same pattern emerged for the upper bound, as the average value for the upper bound indicated by participants in the low value anchor condition was lower ($M = 3.82, SD = 1.66$) than the value indicated by participants in the high value anchor condition. ($M = 10.06, SD = 4.59$). No such anchoring bias in valuers' judgments was found for perceived decline ($F < 1$), the variable measuring the valuation adjustment in qualitative terms ($F = 1.14$), or the final recommendation ($F < 1$).

The main effect for client was significant for the variables measuring the adjustment of the valuation qualitatively, $F(1, 171) = 53.74, p < .001, \eta_p^2 = .24$, the lower bound of the value range, $F(1, 171) = 20.85, p < .001, \eta_p^2 = .11$, the upper bound of the value range, $F(1, 171) = 37.71, p < .001, \eta_p^2 = .18$, and for the final recommendation, $F(1, 171) = 212.74, p < .001, \eta_p^2 = .55$. For the valuation adjustment, participants representing the buyer believed the valuation should be adjusted downwards more heavily ($M = 1.89, SD = 0.79$) than participants representing the seller (the Company) ($M = 3.17, SD = 1.38$), as shown in Figure 6.

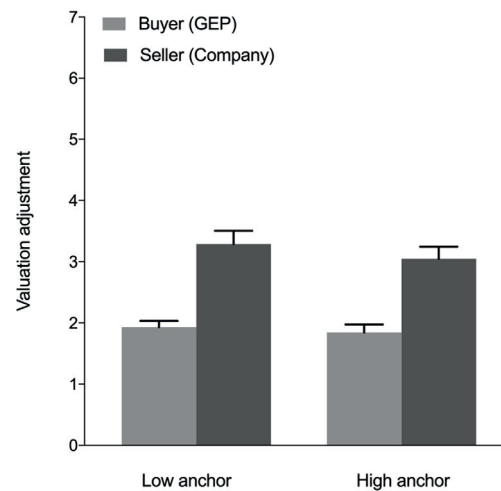


Figure 6. Average valuation adjustment for participants of Study 1 in the low value and high value anchor condition, separated by client (buyer vs. seller). Scores below to midpoint (4) indicate adjustments downwards and scores above the midpoint indicate adjustments upwards.

Likewise, those representing the buyer indicated a lower value for the lower bound of the valuation range ($M = 2.93, SD = 3.03$) than those representing the seller ($M = 5.16, SD = 4.03$). The same was true for the upper bound, where those representing the buyer gave a lower value for the upper bound ($M = 5.49, SD = 3.75$) than those representing the seller ($M = 8.36, SD = 4.59$).

The interaction effect between anchor and client was significant for the lower and upper bounds of the valuation range. Analyses decomposing these interaction effects showed that for the lower bound of the valuation range, the effect of client was significant both for the low value anchor, $F(1, 88) = 36.08, p < .001, \eta_p^2 = .29$, and for the high value anchor, $F(1, 87) = 10.84, p = .001, \eta_p^2 = .11$, and that the effect was significantly larger for the former (although both effect sizes can be considered large; Cohen, 1988). For the upper bound of the valuation range, the same pattern emerged. That is, the effect of client was significant both for the low value anchor, $F(1, 88) = 37.82, p < .001, \eta_p^2 = .30$, and for the high value anchor, $F(1, 87) = 20.84, p < .001, \eta_p^2 = .19$, and again the effect was more pronounced for the former.

The observation that the effect size was larger for the low value anchor in both the lower bound and upper bound was largely driven by the smaller amount of variance in the low value anchor relative to the high value anchor; the mean differences were actually larger for the high value anchors (2.90 lower bound; 4.02 upper bound) than for the low value anchors (1.59 lower bound; 1.81 upper bound). Figure 7 depicts the average values for both the upper and lower bound, and for both levels of the anchor and client variable.

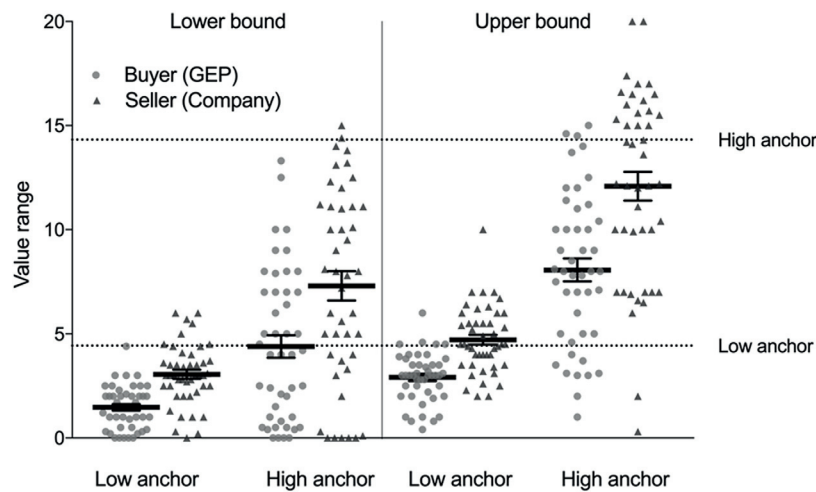


Figure 7. Individual data points of Study 1 for the dependent variables measuring the lower bound (left pane) and upper bound (right pane) of the indicated valuation range, for participants in the buyer condition (circles) and seller condition (triangles), separated by the value of the anchor (low value vs. high value). The two horizontal dotted lines represent the value of the high anchor (14.324M) and the low anchor (4.435M) as presented in the valuation report.

Notably, no effects of anchor or client were found for perceived decline. Rather, it appears that all participants converged with respect to the perceived decline of the business (see Figure 8). This is noteworthy as it suggests that the observed biases exist despite the fact that participants across the conditions similarly viewed the company's economic state.

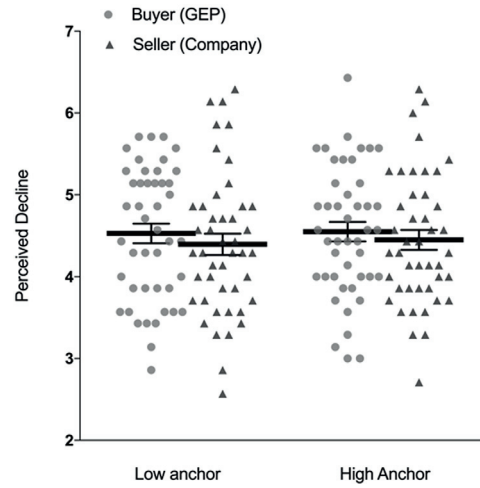


Figure 8. Individual data points of perceived decline for participants representing the buyer (circles) or seller (triangles) with the averages and error bars per anchor and condition indicated by the horizontal black lines.

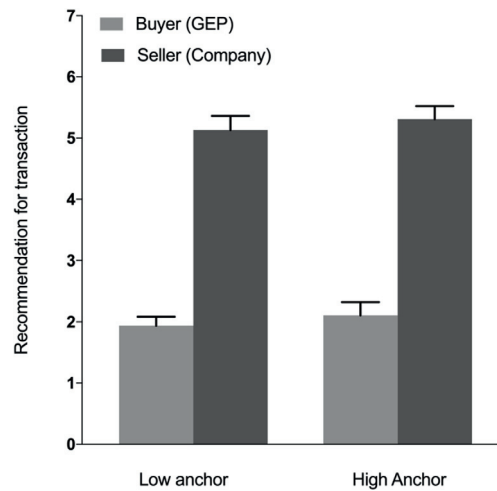


Figure 9. Average recommendations scores in Study 1 for each anchor, separated by client condition. Scores below the midpoint (4) indicate the participants would not recommend their client to go forward with the transaction, and scores above the midpoint indicate the participants would recommend their client to do the deal.

With respect to the final recommendation (Figure 9), the data show that participants representing the buyer generally recommended their client not to go forward with the transaction as indicated by an average score below the midpoint of the scale ($M = 2.02$, $SD = 1.25$). Participants representing the seller, however, generally recommended their client to do the deal at the initial value (i.e., the anchor) ($M = 5.22$, $SD = 1.50$). The level of the anchor (i.e., low vs. high value) did not interact with the client variable ($F < 1$),

suggesting that irrespective of the value presented in the valuation report, participants believed the deal was attractive for the seller but much less so for the buyer, as reflected by the differences in recommendation scores.

Additional Analyses

Valuation components. Interestingly, when participants were asked which components they believed needed to be adjusted, those representing the selling party (i.e., the Company) believed that fewer elements of the valuation report required adjustment than those representing the buyer (see Figure 10). These findings are line with the other results, suggesting that when a valuator represents a buyer in a transaction, the valuator believes the value of the company determined by another valuator should be adjusted downwards more heavily compared to when a valuator represents a seller's interests. Hence, valuers seem to be affected by their client's interests.

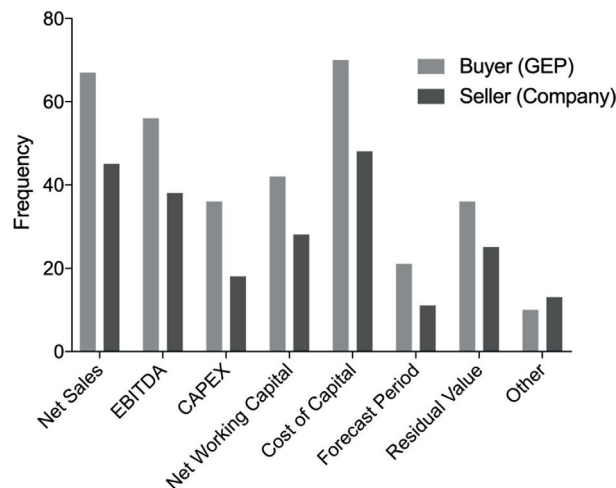


Figure 10. Frequency with which elements were selected to indicate they required adjustment according to the participants representing either the buyer (left bars) or the seller (right bars).

Bias Blind Spot. When participants were first asked whether they believed the valuator hired by the opposing party was affected in his/her judgment by the client's interests, and subsequently whether they believed they themselves were affected in their judgments because of their client's interests, an interesting pattern emerged. Whereas 58.7% believed the valuator representing the opposing party was biased, only 25.1% believed they themselves were biased.

Interestingly, when breaking down these figures based on who the valuers represented, 78.9% of the participants representing the buyer (i.e., GEP, the PE-firm) believed the valuator hired by the seller (the Company) was biased, whereas 'only' 38.2% of the participants representing the seller believed the valuator hired by the buyer was biased. When reflecting on their own potential biases, 32.2% of the participants representing the buyer

indicated they suspected they were affected by their client's interests, whereas only 18.0% of the participants representing the seller believed they were biased as a result of their client's interests. Hence, the data provide clear evidence for the existence of a bias blind spot, meaning participants recognized the potential biasing effect that representing the interests of a certain client might have on others, while generally failing to acknowledge the potential bias in their own judgments.

4.4.3 Discussion Study 1

Study 1 set out to examine whether valuers can be influenced by factors that should not have any bearing on their assessment of a company's value or of other valuations. We found clear evidence for the existence of both anchoring bias and engagement bias, thereby confirming hypothesis 1 and hypothesis 2. That is, when valuers are confronted with a valuation report and are asked to indicate in which range they believe the 'true' value of the company lies, they use the initial value as an anchor and indicate a higher range in case of a higher anchor, and a lower range in case of a lower anchor. Also, valuers appear to be affected by their clients' interests (i.e., engagement bias) i.e., they indicate that a valuation should be adjusted in accordance with their clients' interests. Specifically, when they represent a buyer and therefore have an incentive to lower the share value, they also indicate the valuation should be adjusted downwards more heavily and also indicate a lower value range for the true value of the company. The opposite is true when they represent the seller. Combined, these data show that participants did not so much disagree on the fact that the forecasts were too optimistic and that they needed to be adjusted downwards, but rather by *how much*. The question by how much the valuation needed to be adjusted downwards appeared to be largely determined by the anchor and the interests of the client that the valuator represented. These effects seem to be unrelated to the valuers' perceptions regarding the decline of the valuation object. Hence, despite converging views on the economic state of the valuation object, valuers still suggested adjusting the valuation in accordance with their client's interest and stayed relatively close to the initial value (i.e., the anchor).

Importantly however, an alternative explanation can be put forward for the observed engagement bias. Rather than being affected by their clients' interests, it is possible that the valuers in Study 1 distrusted the accuracy of the valuation report as they believed the valuator hired by the opposing party was biased as a result of their client's interest, and that they therefore adjusted the valuation accordingly to compensate for this fact. Such a process would be a bias in and of itself, called *reactive devaluation*. This entails that proposals or arguments (for example in negotiating settings) are devalued by a party due to the mere fact that they were put forward by an opposing party (Ross, 1995; Ross & Stilling, 1991). This alternative explanation would be in line with the finding that the majority of the respon-

dents believed the valuator representing the opposing party was biased, particularly when this other valuator represented the company. Hence, it is important to investigate whether the findings of Study 1 hold true when the valuation report was created by an independent valuator, rather than by a valuator who represents the interests of the opposing party. If the same effects are found in this situation, this would rule out the possibility that the valuers in Study 1 were distrustful towards the valuation report due to the fact that it was made by someone representing the opposing party, thereby providing further evidence that engagement bias can account for the observed findings in Study 1. Study 2 (i.e., the post-hoc study) aimed to do exactly that, and had two specific goals: first, to replicate the findings of Study 1 to provide more robust evidence for the observed findings; second, to test whether the reactive devaluation hypothesis could account for the observed engagement bias found in Study 1, or whether participants were indeed affected by their clients' interests.

4.5 STUDY 2 (POST-HOC STUDY)

4.5.1 Methods

Participants

In total, 160 business valuation specialists, none of whom participated in Study 1, were recruited via e-mail. Of this group, 15 participants (9.4%) did not pass the attention check, resulting in a final sample of 145 participants. We again targeted the world's leading valuation and corporate finance firms to ensure a sample of highly experienced business valuation experts. Of the final sample, 119 were male (82.1%), the average age was 43.4 ($SD = 14.2$), and the average years of experience in their profession was 16.3 ($SD = 11.1$).

Sixty-one (42.1%) had a post-master's degree in accounting, 118 (81.4%) were enrolled or had been enrolled in a specialized business valuation course, 83 (57.2%) had a post-master's degree in business valuation, 98 (67.6%) indicated that business valuation was their primary focus in their work, for 40 participants (27.6%) this was M&A, and for 7 participants (4.8%) this was accounting; 125 participants (86.2%) indicated that they conduct or are involved in business valuations on a regular basis.

In total, 28 different nationalities are represented in the sample. The five countries with the most participants are the United States with 50 participants (34.5%), Canada with 22 (15.2%), Italy with 12 (8.3%), Germany with 8 (5.5%) and the United Kingdom with 6 participants (4.1%). A complete overview of participants' nationalities can be found in Appendix C7.

For 107 participants (62.8%), English was their native language. Those who were not native English speakers indicated on a 7-point Likert scale whether they understood the questions and experienced no difficulties in answering the questions, ranging from "Strongly disagree" (1) to "Strongly agree" (7). The average score was 6.20 ($SD = 1.22$).

Study 2 was identical to Study 1 apart from one crucial aspect. In Study 1 in both the introduction of the case as well as in the assignment it was stated that *"To determine the value of the Company, [the Company/the PE firm] hired a valuator"*. In Study 2, the introduction of the case stated: *"To determine the value of the Company, both parties agreed to hire an independent valuator"*, and the assignment stated: *"To evaluate the possible entrance of GEP as a new shareholder and to anticipate a possible dilution discussion, the Company and PE firm hired an independent valuation firm to conduct a DCF-valuation of the Company, taking into account the effects of the turnaround plan"*. Hence, the Study 2 participants knew that the valuation report they were going to evaluate was made by an independent valuator who therefore could not have been affected by any stakeholder interests. The Cronbach alphas were .62 for the locus of strategic control scale and .68 for the perceived decline scale.

4.5.2 Results

Based on the same criteria as Study 1, seven participants were excluded from further analyses, leaving a final sample of 138.

We again conducted a MANCOVA and the results showed significant main effects for anchor, $F(5, 174) = 72.91, p < .001, \eta_p^2 = .68$, and client, $F(5, 174) = 62.74, p < .001, \eta_p^2 = .64$, as well as interaction effect between these two variables, $F(5, 174) = 3.13, p = .010, \eta_p^2 = .08$. Table 9 shows the Pearson correlations and Table 10 shows the MANCOVA results.

Table 9. Pearson correlations for the independent variables, dependent variables, and control variables of Study 2 (N=138).

[illegible]

Table 10. Results of the MANCOVA of Study 2.

Independent Variables	$F(5, 126)$	p	η_p^2
Anchor	59.01	<.001	.70
Client	28.97	<.001	.54
Anchor * Client	2.66	.025	.10
Control variables			
Gender	0.52	.761	.02
Age	3.42	.006	.12
Experience	4.62	.001	.16
Locus of Strategic Control	2.94	.015	.10

The main effect for anchor was significant for the variables measuring the valuation adjustment, $F(1, 130) = 15.41$, $p < .001$, $\eta_p^2 = .11$, the lower bound of the value range, $F(1, 130) = 30.05$, $p < .001$, $\eta_p^2 = .19$, the upper bound of the value range, $F(1, 130) = 118.51$, $p < .001$, $\eta_p^2 = .48$, and the perceived decline, $F(1, 130) = 4.00$, $p = .048$, $\eta_p^2 = .03$. Participants believed the valuation should be adjusted downwards more heavily in the high value anchor condition ($M = 2.30$, $SD = 1.22$) than in the low value anchor condition ($M = 3.02$, $SD = 1.17$); see Figure 11.

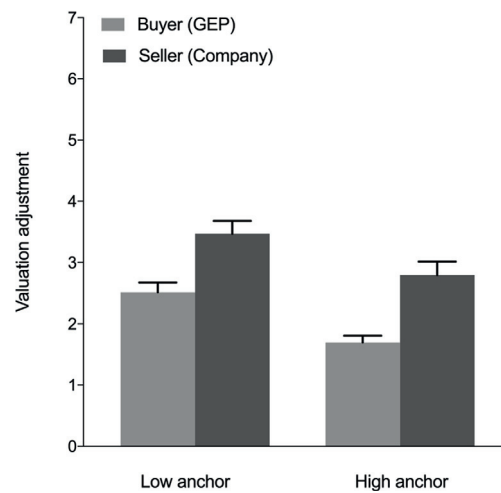


Figure 11. Average valuation adjustment for participants in the low value and high value anchor condition, separated by client (buyer vs. seller). Scores below to midpoint (4) indicate adjustments downwards and scores above the midpoint indicate adjustments upwards.

Replicating Study 1 results, participants in the low value anchor condition gave a lower value for the lower bound of the value range ($M = 2.54$, $SD = 1.21$) than participants in the high value anchor condition ($M = 5.50$, $SD = 4.42$). Also replicating Study 1, the average value for the upper bound indicated by participants in the low value anchor condition was lower ($M =$

4.53, $SD = 1.45$) than the value indicated by participants in the high value anchor condition. ($M = 10.48$, $SD = 4.45$). In contrast to Study 1, an effect of anchor was found for the perceived decline. Participants in the low value anchor condition perceived the decline as slightly less severe ($M = 4.12$, $SD = 0.85$) than participants in the high value anchor condition, ($M = 4.42$, $SD = 0.79$); see Figure 12. No effect for anchor was found for the final recommendation ($F < 1$).

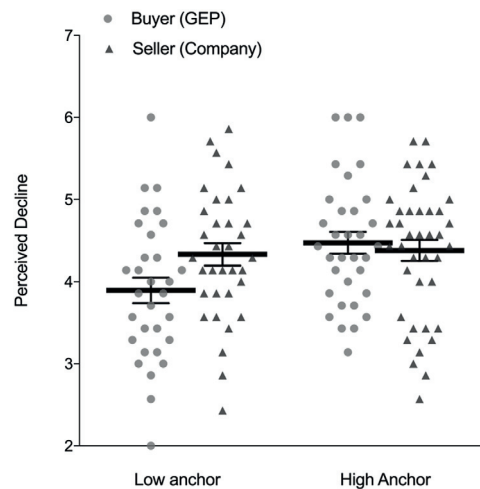


Figure 12. Individual data points of perceived decline for participants representing the buyer (circles) or seller (triangles) in Study 2, with the averages and error bars per anchor and condition indicated by the horizontal black lines.

Fully replicating Study 1, the main effect for the client was significant for the variables measuring the adjustment of the valuation qualitatively, $F(1, 130) = 30.23$, $p < .001$, $\eta_p^2 = .19$, the lower bound of the value range, $F(1, 130) = 6.44$, $p = .012$, $\eta_p^2 = .05$, the upper bound of the value range, $F(1, 130) = 12.48$, $p = .001$, $\eta_p^2 = .09$, and for the final recommendation, $F(1, 130) = 120.36$, $p < .001$, $\eta_p^2 = .48$. For the valuation adjustment, participants representing the buyer believed the valuation should be adjusted downwards more heavily ($M = 2.09$, $SD = 0.87$), than participants representing the seller ($M = 3.11$, $SD = 1.33$); see Figure 11.

Similarly, those representing the buyer indicated a lower value for the lower bound of the valuation range ($M = 3.23$, $SD = 2.30$) than those representing the seller ($M = 4.87$, $SD = 4.34$). For the upper bound, those representing the buyer gave a lower value for the upper bound ($M = 6.58$, $SD = 3.96$) than those representing the seller ($M = 8.63$, $SD = 4.75$). Similar to Study 1, participants representing the seller again recommended their client to go forward with the deal ($M = 4.78$, $SD = 1.47$), whereas those representing the buyer did not ($M = 2.30$, $SD = 1.09$). Hence, Study 2 provides further evidence for the existence of engagement bias among valuation specialists.

The interaction effect between anchor and client was significant only for the lower bound of the valuation range, $F(1, 130) = 6.37, p = .013, \eta_p^2 = .05$. Analyses decomposing this interaction effect showed that the effect of client was significant only for the high value anchor, $F(1, 71) = 7.46, p = .008, \eta_p^2 = .10$, but not for the low value anchor, $F(1, 63) = 0.87, p = .35, \eta_p^2 = .01$. Figure 13 presents the average values for both the upper and lower bound, and for both levels of the anchor and client variable.

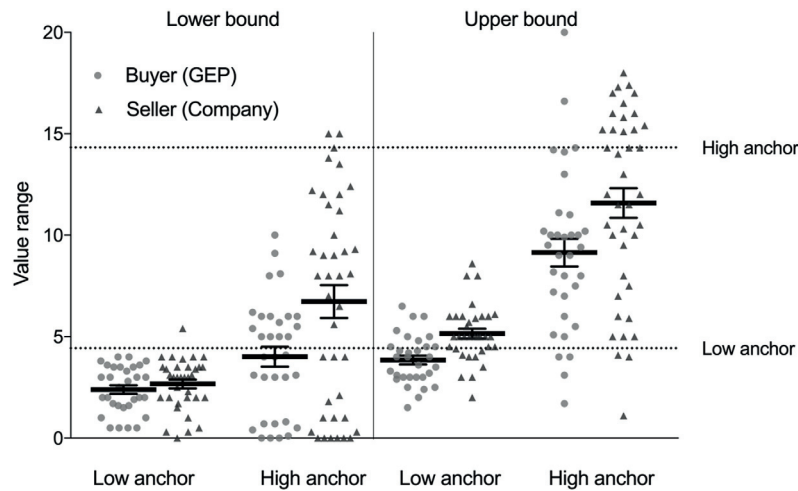


Figure 13. Individual data points for the dependent variables measuring the lower bound (left pane) and upper bound (right pane) of the indicated valuation range, for participants of Study 2 in the buyer condition (circles) and seller condition (triangles), separated by the value of the anchor (low value vs. high value). The two horizontal dotted lines represent the value of the high anchor (14.324M) and the low anchor (4.435M) as presented in the valuation report.

For the final recommendation, participants representing the buyer recommended their client to not go forward with the transaction as indicated by an average score below the midpoint of the scale ($M = 2.34, SD = 1.13$), whereas participants representing the seller recommended their client to do the deal ($M = 4.81, SD = 1.49$); see Figure 14.

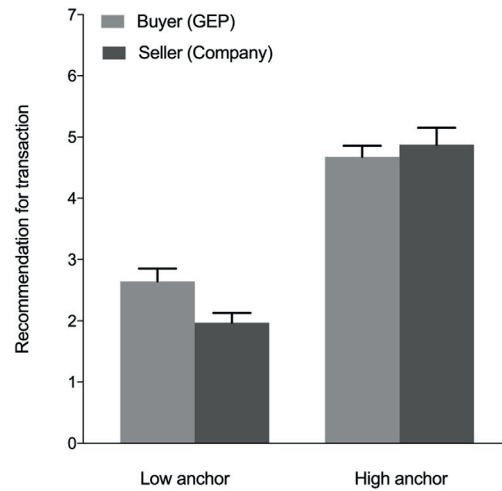


Figure 14. Average recommendation scores in Study 2 for each anchor, separated by client condition. Scores below the midpoint (4) indicate the participants would not recommend their client to go forward with the transaction, and scores above the midpoint indicate the participants would recommend their client to do the deal.

Additional Analyses

Valuation components. Regarding the components of the valuation that participants believed needed to be adjusted, a different pattern emerged than in Study 1. Whereas those representing the selling party (i.e., the Company) in Study 1 believed that fewer elements of the valuation report required adjustment than those representing the buyer's interests, no clear difference based on the client condition were found in Study 2 (see Figure 15).

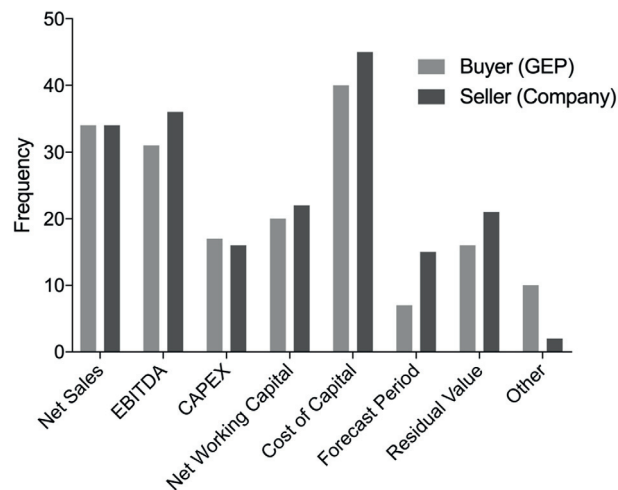


Figure 15. Frequency with which elements were selected to indicate they required adjustment according to the participants representing either the buyer (left bars) or the seller (right bars) in Study 2.

Bias Blind Spot. Similar to Study 1, participants believed the independent valuator was biased more often (42.0%) than they believed themselves to be biased (23.2%), again providing evidence for bias blind spot.

4.5.3 Discussion Study 2

Study 2 replicated the key findings of Study 1 providing evidence for the robustness of anchoring bias and engagement bias among valuation specialists, hence providing further support for hypothesis 1 and hypothesis 2. Importantly, Study 2 aimed to test the extent to which processes of reactive devaluation can account for the observed engagement bias in Study 1. Given that Study 2 again provided evidence for the existence of engagement bias while the valuation report under scrutiny was produced by an independent valuator (thereby nullifying potential reactive devaluation), it is unlikely that reactive devaluation processes can account for the observed effects. Rather, it is more likely that the participants were in fact biased in their judgments due to their clients' interests. When comparing the effect sizes of Study 1 and Study 2, the engagement bias in Study 1 appears to be larger than in Study 2, suggesting that reactive devaluation processes may account for at least some degree of the observed engagement bias in Study 1, but this difference is not statistically significant.⁵

4.6 GENERAL DISCUSSION

In this study, we aimed to find an explanation for valuation disputes stemming from conflicting value perceptions between valuers. We examined whether valuers are affected by anchoring bias and engagement bias and found robust evidence for both effects. Specifically, when valuers are presented with an anchor (e.g., a valuation report conducted by another valuator), their perceptions regarding the value of a particular company are affected by the anchor; relatively high anchors result in higher valuations compared to when a relatively low anchor is presented. Additionally, when valuers represent their client's interest, this relationship affects the valuator's judgments so that these are more in tune with their client's interest. If their client is looking to sell and would therefore benefit from a high valuation, the valuator values the object higher than when the valuator represents a buyer who would benefit from a lower valuation.

5 The datasets of the two studies were combined and the dependence of the valuator was added as a factor (0 = dependent, 1 = independent). When adding this factor to the multivariate model, no interaction effect with client, $F(5, 309) = 1.42, p = .216, \eta_p^2 = .02$, nor a main effect of dependence was found, $F(5, 309) = 2.01, p = .077, \eta_p^2 = .03$.

Interestingly, when participants were asked to motivate their answers regarding the adjustment of the valuation, none hinted even vaguely towards the potential influence of anchoring bias or engagement bias. Also, the majority of participants in both studies self-reported they believed themselves not to be biased due to their client's interest. Therefore, we assume that these biases operate largely in an unconscious fashion and that the participants rationalized their intuitions regarding the company's value post-hoc. However, we did not explicitly measure awareness of the biases' influence on the participants' judgments, so we cannot draw strong conclusions regarding the degree to which the observed biases operate unconsciously.

Although we acknowledge that differences in value perceptions and valuation outcomes can be partially explained by economic concepts like subjectivity and utility theory, and even that individual skills and experience of valuers might play a role in explaining such differences, we provide a first demonstration that biases can play a prominent role in explaining differences in valuation outcomes.

Theoretical and practical implications

Our study research adds to the literature in the following ways. First, we add to the literature on anchoring bias by demonstrating that business valuers are not immune to anchoring bias effects, further demonstrating bias robustness. The observation that valuers are affected by anchoring bias is alarming as valuations should ideally be constructed independent to any effects of initially presented values and guiding information. Nonetheless, in valuation practice, anchors are frequently provided in different ways; directly or indirectly, expressed in a figure, or by means of expressing a wish or direction with respect to a valuation. Without acknowledging the presence of anchoring effects in valuation engagements, discussions about value might start from an incorrect starting point, resulting in misvaluations, suboptimal investment decisions (i.e., buy or sell) and costly disputes.

Second, we explored engagement bias, that up to now has hardly received any empirical research attention. The notion that business valuers are affected in their judgments following from their clients' interests is a bias that we have called engagement bias. To our knowledge, the only empirical work to date that has investigated whether professional judgments are affected by professionals' clients' interests is work by Firth et al. (2013) who demonstrated that brokerage firm analysts' stock recommendations are affected by their mutual fund clients' interests. The optimal condition for a valuator is to have full professional autonomy when being involved in a valuation engagement. However, we show that due to engagement bias, professional judgments can be overshadowed by the urge to satisfy clients, ultimately leading to suboptimal valuations and possibly even liability claims for the valuator.

Following these findings, we encourage both academics and professionals in the field of business valuation to pay increased attention to the

psychological factors affecting their work. Despite the commonly heard catchphrase “valuation is a craft, not a science” (e.g., Damodaran, 2016), the extensive attention in the valuation literature on valuation techniques (i.e., valuation methods), inputs (i.e. valuation rationalities; e.g. growth rates, earnings, discount rates, and adjustments to income statements), and valuation related aspects such as minority discounts, control premiums, and marketability discounts, suggests valuation is typically treated more as a science than an art. However, our study emphasizes that business valuation consists of many more dimensions than just valuation techniques and inputs. Hence, we recommend an increased focus on the psychological factors that can influence perceptions regarding a valuation object and, ultimately, valuations. Although we acknowledge that cognitive biases are hard to minimize or regulate, we advocate for an increased awareness of the influence of biases in business valuations. Discussions regarding the causes of large differences in value perceptions and corresponding valuation outcomes can benefit from insights from behavioral sciences, including our research.

Limitations and Future Research

A potential limitation of our study is that participants were presented a compressed valuation report and asked to give a second opinion on a report from another valuator. The question can be raised whether the observed results would have been different if the participants were asked to reflect on a more comprehensive valuation report or even to conduct a complete valuation themselves. Nevertheless, practice shows that second opinions providing a quick analysis on a valuation outcome are commonplace, suggesting our findings can at least be generalized to these real-world situations. Moreover, it is possible that providing a comprehensive valuation report or conducting an own valuation would result in even stronger effects than those found in our study. That is, if the manipulation used (i.e., asking participants to adopt the perspective of the valuator hired by either the Company or the PE-firm) caused participants to be biased due to their client’s interest. It is not unreasonable to think that in the real world, where the pressure to successfully complete an engagement and satisfy clients is much more intensely felt, even larger effects might be observed.

Nonetheless, we would encourage future research to investigate these biases in real-world business valuations. Additionally, we encourage future research to develop measures that can mitigate the effects of biases affecting valuator judgments. A first direction could be to enhance awareness of this topic across valuers and stakeholders of valuations. Incorporating knowledge of the effects of both anchoring bias and engagement bias in valuation education and training is a first step in mitigating these effects in the long run. A second direction could be to find ways that would allow valuers to conduct valuations in a more isolated manner, free from the pressure inherent to dependent client relationships, the purpose of the valuation in relation to the outcome, and the client’s interest in the valuation. Finally,

it might be worthwhile exploring whether a protocol can be developed containing guidelines and principles geared towards reducing the effects of biases in valuations, ultimately contributing to the goal of creating more objective valuations and hence reducing large differences in valuation outcomes.

This chapter showed that business valuers can be affected by anchoring bias and engagement bias. In Chapter 5, we explore to what extent valuation professionals recognize and acknowledge the observations of Studies 1-3 in the course of their own work, as well as in the work of their peers. Additionally, we present a 'Statement of Principles for Valuation Practice' focused on mitigating the effects of biases in valuers' work.