5 Design of the Empirical Study

According to BRYMAN'S classification of research approach elements (Bryman, 2004), the following chapters contain the chosen research strategy, research design, and the according research process for the empirical study, which is the core part of this dissertation. They also contain the reasoning why the research strategy, design, and process are suitable to investigate the research objectives stated in chapter 2.3 and why they fit in the overall research strategy depicted in chapter 2.4.

5.1 Epistemological Position

The theory of science underlying this dissertation is *interpretivism* sometimes also credited anti-positivism, which is underlying most qualitative research methodologies such as grounded theory, from which this dissertation draws substantial methodological approaches (Glaser & Strauss, 1967; P. Y. Martin & Turner, 1986; Morgan & Smircich, 1980; Suddaby, 2006). Qualitative research in the tradition of interpretivism focuses on causal explanations instead of statistical correlations. The latter are often associated with positivism. Comparable to *ethnomethodology*, reality is understood as a social construction (Morgan & Smircich, 1980, p. 497). This understanding is fitting the research objective quite well as researching the practices of firm valuation requires to investigate how valuation practitioners perceive a firm, its environment, and its prospects, how they construct mental representations of these aspects and how they draw conclusions from this construct to determine a value for a firm.

Additionally, qualitative research also allows *falsifying* theory or evaluating the contexts, in which theories are valid or not, by collecting and investigating observations in conflict with existing theory: "Case study findings can have implications both for theory and development and for theory testing. On the inductive side of theory development, plausibility probes and studies of deviant cases can uncover new or omitted variables, hypotheses, causal paths, causal mechanisms, types, or interactions effects." (George & Bennett, 2005, p. 109) This aspect of qualitative research can be theoretically based on the *critical rationalism* proposed by POPPER (2002).

The epistemological position creates the basis for the investigation, but should not be regarded as strict dogma. In general, I follow a pragmatic approach best suited to achieve the research objectives. SUDDABY (2006, p. 639) states in this context: "But being aware of one's epistemological position does not justify dogmatism about conducting grounded theory re-

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search. Ultimately, questions of when saturation is achieved, how coding should be done, or when counting is appropriate can be resolved pragmatically."

5.2 Research Strategy

The following paragraphs depict the empirical study's research strategy based on the chosen epistemological position, the research objectives, and the general research strategy depicted in chapter 2.4.

The core of this investigation is investigating valuation practices and extending existing based on the results of this investigation. Investigating practices requires researching *how* and *why* processes or methodologies are applied and by this identifying *why* practitioners come to certain results using the investigated practices. In order to investigate *how* and *why* questions literature on research strategies recommend the use of qualitative research (Bryman, 2004; Eisenhardt & Graebner, 2007; Eisenhardt, 1989; Gephart, 2004; Helfat, 2007; Suddaby, 2006; Whittington, 1996; Yin, 2003). HELFAT for example states:

> Qualitative research, however, has an important role to play in uncovering interesting or unexpected phenomena that statistical analysis may miss, because such research provides fine-grained detail and insights that can only come from case analysis. Findings from qualitative research in turn can form the basis for larger scale data collection and analysis. (Helfat, 2007, p. 189)

Especially with regard to investigating the mentioned *how* and *why* questions, I take up RYNES ET AL. assumption: "Tacit assumptions of practitioners can be made explicit through interaction academics employing case analysis, grounded theory, or protocol analysis. . . . Higher levels of direct contact with practitioners should improve the quality of academic research." (Rynes et al., 2001, pp. 348–349)

To go into more details, I chose a qualitative research strategy because of the following reasons:

(1) No empirical research on the use of valuation methods by practitioners has been conducted with regard to *how* and *why* questions (compare research gap in chapter 2.2).
(2) The valuation of innovation potential by practitioners has not been investigated before (compare research gap in chapter 2.2).
(3) Professional service firms and equity investors such as venture capitalists, auditors, investment bankers, or other corporate finance professionals dominate the community

of valuation practitioners. Many community members change employers within the community (also compare my sample in Appendix A) and are likely to have a close range of valuation approaches. Thus, a more detailed, open, qualitative research approach incorporating a smaller number of experts is likely to yield better results than a structured confirmatory quantitative investigation and at the same time is likely to have reasonable reliability and validity.

Discussion of research strategy alternatives

The following paragraphs depict two alternatives to the chosen research strategy and discuss the disadvantages compared to the chosen research strategy.

Using a *structured survey* to confirm hypotheses derived from existing theory:

(1) There exists no research with stated and confirmable hypotheses/scales about the application of existing valuation methodologies in the context of innovation potential.
(2) The use of a highly structured survey is not recommended to research such a complex phenomenon and to reveal answers to *why* and *how* questions.
(3) Experts with the expertise in valuation work in a very demanding job environment; thus, a real danger of a very low response rate exists, if no personal contact to those experts has been built.
(4) The population of professional service firms offering valuation services is little; thus, a representative return of surveys suitable for statistical analysis is unlikely.
(5) As the investigation revealed, many experts changed jobs between the professional service firms in focus, which on the one hand further reduces the variety within the sample population on the other hand raises the validity of implications for the smaller group of interviewees.

Using an *ethnographical approach* and investigate only very few detailed valuation cases:

(1) Existing theory in the field of valuation methodologies such as the respective valuation standard literature does not justify the completely explorative extent of a single or two case study approach.
(2) Ethnography for only one or two cases does not allow the investigation of valuation practices contingent on the defined firm types and, thus does not allow a comparative investigation (compare chapter 4.2).

5.3 Research Design

The empirical investigation's research design builds on the contingent research approach that utilizes a typology depicted in chapter 2.4. Comparative empirical research based on case studies should have a good fit to the chosen theory-guided overall contingent research design because a comparative empirical research design allows a better understanding of social or business phenomena due to the logic of comparison between two or more contrasting case studies (Bryman, 2004, pp. 53–55). Case study research in general offers the following strengths: Potential for achieving high conceptual validity; strong procedures for fostering new hypotheses and identifying new variables; value as a means to closely examine the hypothesized role of causal mechanisms, and capacity for addressing causal complexity (George & Bennett, 2005, p. 19). In the context of theory-building or theory-extension, comparative research is well-suited to generate hypotheses from empirical data, as "the elements of theory that are generated by comparative analysis are, first, conceptual categories and their conceptual properties; and second, hypotheses or generalized relations among the categories and their properties." (Glaser & Strauss, 1967, p. 35)

Combining the theory-driven contingency design (typology) and the empirical-driven comparative design should enable analytic induction of decision-making and valuation processes and practices as GEORGE & BENNETT state:

> The procedure makes use of an inductive approach for theory-building, but it is analytic induction not raw empiricism. The black boxes of decision-making and strategic interaction are opened up and efforts are made to study actual processes of decision-making and of strategic interaction insofar as available data permitted (George & Bennett, 2005, p. xi).

The following paragraphs will describe unit of analysis and construction of cases in more detail.

Unit of analysis

The units of analysis within my research are valuation practices to appraise the innovation potential of different target firm types. Those practices are defined as a combination of methodologies and information used to appraise the innovation potential of firms within the context the valuation is conducted in.

Construction of cases

According to GEORGE & BENNETT (2005, p. 17), I define a case as an instance of a class of events. In the context of this investigation, those instances are valuations that practitioners have conducted during their professional careers.

To access those instances I interviewed valuation practitioners and asked them to elaborate about their firm valuation practices with the focus on considering the firms' innovation potential. Expert interviews offer the advantage that the expertise of more than one valuation case and the reflection and learning based on those cases can be leveraged in the empirical investigation. Relating this to the unit of analysis, thus, a single interview is likely to contain information about more than one instance of the unit of analysis depending on the experience of the practitioner. A disadvantage of expert interviews is that they can be considered as secondary data as the investigator was not present at the time the valuations actually happened. This might lead to biases that have to be taken into account and dealt with (see chapter 5.4.3).

5.4 Research Process

The following sub-sections describe the three major qualitative research process steps *sample selection*, *data collection*, and *data analysis*.

5.4.1 Sample Selection

I built the sample of experts based on the typology framework developed in chapter 4.2 as "the construction of deductive typological theories can suggest an initial list of variables and point out cases whose study is most likely to provide theoretical insights." (George & Bennett, 2005, p. 240) Experts were selected according to the lifecycle stage of their typical valuation targets, e.g., venture capital practitioners were selected because they appraise idea firms and investment bank practitioners because they majorly appraise mature firms. Thus, the empirical sample was selected according to theoretical sampling (Glaser & Strauss, 1967, pp. 45–77).

I did not restrict the sample to valuators dealing with certain industries. The reason for this decision is that innovation potential as defined in the chapters 3.2.5 and 4 is on an abstraction level that should be applicable to firms of all industries. A division into three groups characterizes the selected sample:

Group 1: I gathered information by leveraging the expertise of valuation experts from companies valuing firms as important part of their core business as professional service firms. Those

are investment banks, corporate finance advisors, auditors, and a lawyer specialized on intellectual property (IP). HAUNSCHILD'S investigation (1994) also suggests that acquiring firms turn to professional service firms in case of valuation uncertainty, which is especially true for firms whose commercial success depends on innovation and the risks and uncertainties associated with innovation.

Group 2: I included venture capital investors, corporate venture capital investors, private equity investors, and a business angel investor. The valuation of high-risk/high-return companies is one of their core processes (Franke, Gruber, Harhoff, & Henkel, 2008; Gorman & Sahlman, 1989; MacMillan et al., 1985; Sanders & Boivie, 2004). I assume that venture capital investors invest majorly idea firms, corporate venture capital investors invest in later stage idea firms or growth firms (Dushnitsky & Shapira, 2010), and private equity investors invest majorly in growth or mature firms.

Group 3: I included two experts from industry firms' business and development departments to allow for the fact that valuation experts in the previously mentioned professional service firms often work closely together with their industry principals.

Table 12 summarizes the mapping from experts to the three firm types investigated in this dissertation. The mapping in this table is the result of the descriptive information about the practitioners' valuation expertise with certain firm types taken during the interview. It was not possible to determine the exact mapping in advance of the interviews as experts might have had expertise with different types of firms.

Table 12. Allocation of Experts in Data Sample and Firm Types

Firm Type	Idea Firms	Growth Firms	Mature Firms
Experts	Business angels	Auditors	Auditors
	Business developers (industry)	Corporate finance advisors	Corporate finance advisors
	Venture capital investors	Corporate venture capital investors	Investment bank professionals
		Business developers (industry)	Intellectual property specialists
		Investment bank professionals	Private equity investors
		Intellectual property specialists	
		Private equity investors	

By using the lifecycle concept, the sample contains both extreme cases (valuation of idea and valuation of mature firms) as well as cases between those both extremes or even between two of the three defined firm types.

Using the theoretical sampling and the descriptive data captured in the interviews, I was able to populate all three firm types with according statements for all typology dimensions. I took repeating statements of the experts mapped to the same firm type as proxy for empirical saturation of each firm type (Glaser & Strauss, 1967, pp. 45–77).

As I focus on strategic investments majorly based on equity investments and acquisitions of resources with this dissertation, I left out providers of loans and credits such as regular banks. Literature indicates especially in the context of idea and growth firms that banks might not have the necessary skills to evaluate projects or firms with few collateralizable assets and significant uncertainty (Gompers & Lerner, 2004, p. 163).

5.4.2 Data Collection

I collected the empirical data by conducting semi-structured interviews with the experts mentioned above in the years 2009-2012. The interviews took from 45 to 90 minutes and were conducted in most cases at the expert's office (some per telephone). I consider three interviews as pre-test (one industry interview, one venture capital interview, and one auditor interview) because after conducting these interviews, I complemented the interview guideline slightly and adapted it to the information gathered. Due to the explorative nature of this study, which should be considered as an iterative research process with the possibility to adapt the research process to new information, it makes sense to include all available information gathered to draw conclusions for my investigation (Bennett & Elman, 2006; Corbin & Strauss, 1990; Eisenhardt & Graebner, 2007; Eisenhardt, 1989; Gephart, 2004; Suddaby, 2006; Yin, 2003). Therefore, I did not exclude the information gathered during the pre-test from my final analysis. All interviews were recorded with a voice recorder except the pre-test interviews for which I used notes. After conducting the interviews, I transcribed interviews statement by statement into a spreadsheet database and coded them (compare next sub-section).

The interviews covered the following main topics (the original interview guideline can be found in Appendix B):

(1) *Descriptive data* about the expert (education, years of experience, valuation targets (lifecycle-phase and/or size). Existing research suggests that an expert's experience and expertise influence the way he considers data and makes strategic decisions (for example Melone, 1994)
(2) The *significance of the innovation potential* during a company valuation (closed and open questions)

(3) The *way the innovation potential is considered* in a company valuation (open questions)
   a. The way concrete innovation projects are considered in a valuation (derived from a conceptual model about innovation potential)
   b. The way innovation capability is considered in a valuation (derived from a conceptual model about innovation potential)
   c. The way the effects of changes to the company are valuated (for example due to additional resources in the case of a VC-investment or dys(synergies) due to a merger integration)
   d. The methods that are used for the valuations of the innovation potential and its conceptual parts
   e. The data that is considered in the valuation
   f. The dealing with risks associated with the outcomes of the innovation potential

(4) The *context (for example time and resources)* in which valuations take place (open questions)

(5) The *parties involved in the valuation process* (open questions)

(6) The *possibilities of improving* the used methodologies, their application, or the information that should be considered additionally (open questions)

5.4.3 Data Analysis

"In discovering theory, one generates conceptual categories or their properties from evidence; then the evidence from which the category emerged is used to illustrate the concept." (Glaser & Strauss, 1967, p. 23) Following that approach, I condensed and interpreted the empirical data by conducting the following steps:

(1) Expert-statements were transcribed in the order they have been made during the interview in a spreadsheet database (one statement per row, mapped to the firm type they are associated with) and compared with the notes taken. Statements were transcribed very close to what was said; with few exceptions, the original quotes are used.

(2) Expert-statements were associated with the dimensions of the typology main topics of the interview guideline (see last sub-section) by the use of codes.

(3) New codes were introduced, if statements did not fit into the main topics

(4) A new level of codes on a different abstraction level was introduced to allow grouping statements to newly created groups within or across the main topics (compare step 2)
(5) Step 4 groupings were than taken as 1st order constructs in the tables in chapter six of the dissertation and further abstracted to 2nd order constructs.

This coding allowed forming themes, concepts, and hypotheses about the research gap in a pragmatic way. Additionally, original statements are used throughout the following sections to illustrate the derived constructs and relationships.

As qualitative research is prone to biases by the researcher at least two biases should be addressed: Biases with regard to the selection of cases and biases during the collection and interpretation of data.

Selection bias

Selecting cases or in this case interview partners is a well-known challenge in qualitative research (Bennett & Elman, 2006, pp. 460–463). The most common critique is the selection of cases by a proposed result of a dependent variable, for example selecting only "successful" firms to investigate factors for a firm's success. By this methodology, it is not possible to differentiate between the necessity and the sufficiency of an investigated independent variable for a proposed value of the dependent variable.

The theoretical sampling was not made with a specific dependent variable in mind, but according to the firm types in chapter 4.2. This dissertation is an open investigation of what practitioners do. Thus, a selection bias rooted in selecting cases by observing specific outcomes can not be given.

Furthermore, I'm not affiliated with any of the interviewees' companies. The only interaction with the interviewees regarding the investigated topics took place during the interviews and never in a work context. Interviewees were acquired by using my personal network, career fairs or non-personalized inquiries addressed to companies in accordance with the sample criteria.

Data collection and interpretation bias

With regard to data collection & interpretation, researches are prone to several biases caused by themselves or their interview partners:

(1) Asking leading questions with implicit hypotheses.
(2) Transcribing and coding interviews in a way that implicit hypotheses are confirmed.
(3) Experts perceive or present their valuation expertise in an idealized way.

I dealt with these possible biases the following way:

(1) An open interview atmosphere was created. Answers are treated in an anonymous way. The results and publication of results do not pose a threat to the perception of others regarding interviewee or her/his company.
(2) In most cases, open questions have been used.
(3) Factual questions have been used. The self-evaluation of a practitioner's expertise has been asked in a separate question block at the end and not in between factual questions.
(4) The interviews are transcribed statement-wise/quote-wise. No condensation or interpretation has been made in the first step of collection.
(5) The coding of results has been examined, reviewed, revised with several breaks (sometimes more than half a year) during the time of the research to facilitate an unbiased interpretation of the collected data.

5.5 Data Sample

To investigate the research objectives, I composed a data sample by the way of theoretical sampling that reflects the need to consider valuations of companies in different stages of their lifecycle. I created this sample by selecting valuation experts from professional service firms offering valuation services on the one hand or equity investors on the other hand. The sample consists of experts from venture capital companies, corporate venture capital companies, investment banks, auditors, and a private equity investor. I enriched the sample by a business development and acquisition professional from an engineering company, a head of business development from an Internet trading company, and a lawyer with special expertise on intangible assets. Altogether, I conducted interviews with 21 experts from 20 companies. The experts' experience in valuation topics ranged from one to more than 20 years with an average of about 7 years. The interested reader will find detailed information about the interviewed experts in Appendix A.

Table 13. Experts and Statements in Data Sample

Company Type	Industry	Business Angel / Venture Capital	Corporate Venture Capital	Private Equity	Investment Bank	Auditor
Number	2	4	2	1	6	5
Number of statements	83	179	188	67	454	380

With the selected interview partners I was able to get expertise for all three firm types (compare chapter 4.2.1) and populate the typology with statements mapped according to those types.

Table 14. Interview Statements per Firm Type

Company Type	Idea firm	Growth firm	Growth or mature firm[12]	Mature firm
Number of statements	190	260	502	399

As can be seen in Table 14 the collection of data led to a reasonable saturation of statements per firm type.

The validity and reliability of the qualitative empirical investigation should be at a reasonable level. On the one hand, the large majority of interviewees either work for professional service firms or equity investors that should be involved in the majority of relevant firm valuations and conduct valuations as their profession (validity). On the other, the interviewees are equipped with an average experience of about seven years in their valuation jobs and should have participated in a significant number of valuations (reliability).

[12] Statements in this category could not be mapped clearly to only one of the two firm types. They were mapped to either both firm types or according to the context the statement was made in, e.g., the valuation projects the interviewee mentioned or the major firm types, he has dealt with in her/his career.