

2 Research Gap, Objective, and Strategy

As GEORGE & BENNETT (2005, p. 74) note, new research “should be embedded in a well-informed assessment that identifies gaps in the current state of knowledge, acknowledges contradictory theories, and notes inadequacies in the evidence of existing theories. In brief, the investigator needs to make the case that the proposed research will make a significant contribution to the field.” In the following subchapters, I will first of all depict the significance of the topic, the gaps in the current state of knowledge, and the significance to close these gaps. Then, I will constitute particular research objectives, which I derive from the identified gaps.

2.1 Significance of Valuing Firms and Their Innovation Potential

Firm valuation is a critical step in the resource allocation process within an economy or for a firm’s management. Within an economy, financial investors value firms as investment opportunities to determine which of them hold the best prospects of generating the highest rents for their financial investments. By this, the financial market allocate financial resources to firms with the best profitable growth prospects and advance economic growth (Block, 1999; Demirakos et al., 2004; Imam et al., 2008; Myers & Majluf, 1984; R. Pike, Meerjanssen, & Chadwick, 1993).

Within a firm, the firm’s management (or the “entrepreneur” as COASE (1937) states) allocates scarce resources and capital to those initiatives with the highest prospects of supporting the firm’s growth and its profitability (Barney, 1996, 1999; Myers, 1984; Wernerfelt, 1984). These initiatives also include the acquisitions of other firms to get access to technologies, resources, or capabilities, which would have been more expensive to build within the own firm (for example Angwin, 2007; Coase, 1937; Hagedoorn & Duysters, 2002; Wernerfelt, 1984, 2005). A prerequisite for the success of such initiatives is to assess whether or not the costs of such investments or acquisitions are lower than the value that is created for the acquiring company by the acquisition. A valuation determines the perceived value of firms that are acquisition candidates (Copeland et al., 2000; Damodaran, 2002; Penman, 2006a). This perceived value and its influence on the later agreed and paid price determines, if value is gained or lost for the acquiring firm by a firm acquisition or the investment in a firm.

Thus, the valuation of a resource is a critical process within the resource-based view: “The price paid for the acquired resource(s) greatly affects that resource’s contribution to the firm’s ability to create value, especially in terms of owner’s wealth.” (Sirmon, Hitt, & Ireland, 2007,

p. 278). WERNERFELT (1984, p. 172) further states: “An acquisition can be seen as a purchase of a bundle of resources in a highly imperfect market. By basing the purchase on a rare resource, one can *ceteris paribus* maximize this imperfection and one's chances of buying cheap and getting good returns.” This highlights the understanding that complex resource bundles and firms are traded in imperfect markets. LIPPMAN & RUMELT (2003) contribute an alternative description within the cooperative game theory. Within this theory, the value of various resource combinations must be determined. Value can only be created by trading resources as long as there are hitherto unexamined combinations available.

Thus, a resource becomes useful and valuable for an acquirer, if and only if, he alone recognizes more value in this resource for himself than the other market participants and the seller of this resource do (Barney, 1988). DENRELL ET AL. infer that strategic opportunities exist whenever a price fails to reflect the value of a resource's best use.

Existing research about the success of firm acquisitions for the acquirer show mixed results. Acquisitions do not reliably yield desired financial returns for the acquirer (Agrawal, Jaffe, & Mandelker, 1992; Barney, 1988; Bradley, Desai, & Kim, 1988; Capron & Pistre, 2002; Healy, Palepu, & Ruback, 1992, 1997; King, Dalton, Daily, & Covin, 2004). It can be inferred that one reason of these empirical results might have been that the paid prices for the acquired firms were higher than the value the firm was able to contribute to the acquirer. Thinking one step further, this must be accredited to a “wrong” valuation of the target company (M. Hitt, Harrison, Ireland, & Best, 1998).

So, what are the influences on the value of a resource? “Every asset, financial as well as real has a value. The key to successfully investing in and managing these assets lies in understanding not only what value is, but the sources of the value.” (Damodaran, 2002, p. 1) But what determines in our case what value is and what the sources of this value are? KOLLER ET AL. state: “Companies create value by investing capital at rates of return that exceed their cost of capital.” (Koller, Goedhart, & Wessels, 2005, p. vii). This is a clear reference to “the concept of future prospects and particularly of continued growth in the future” (B. Graham, 2003, p. 564) that is widely used to value assets and firms (compare income approaches in chapter 3.3.2)

Having analyzed this relationship between value and future prospects, how can a valuator determine the future prospects of a firm or, if the firm will continually grow in the future? Innovation theory should provide an important input to answering this question. If innovation

“is the act that endows resources with a new capacity to create wealth” (Drucker, 1985, p. 30), then analyzing this act of innovation should enable a valuator to draw conclusions on the “wealth generation” potential, the future prospects, and, in the end, the value of a resource such as a firm.

Summing up this theoretical deduction, as a firm’s potential to innovate should have an influence on its value, this potential’s appraisal should have an influence on a firm’s valuation.

2.2 Existing Research and Research Gap

To legitimate new research projects, it is important to analyze existing scientific literature and depict new studies in the light of this existing research. Before starting with this study, I analyzed around 1,000 scientific articles and books about the topics innovation, corporate finance & valuation, mergers & acquisitions, intangibles, decision theory, resource-based view, and other views and theories of the firm.¹ Nevertheless, this dissertation has not the purpose to provide a literature review or aggregation. Therefore, and in respect to the chosen explorative empirical research design, which demands a certain openness in the perception of the collected empirical data, I will depict or reference only the existing literature relevant to depict the research gap (this chapter), relevant to build theoretical guidance for the empirical investigation (chapter 4), and the discussion of the empirical findings (chapter 6).

In this dissertation, I will focus on a context of valuation, in which investors are not able to diversify the risks associated with an individual investment by the means of the financial market, for example by managing a diversified portfolio of shares. This is the case when investors dedicate a significant share of their disposable resources to a single investment and therefore are supposed to conduct a thorough valuation of the resources they want to acquire or invest in. The firms or investors dealing with such investments and according valuations are in most cases strategic investors. Those are for example industrial firms with strategic intentions, venture capitalists², private equity investors or corporate finance professional service firms such as investment banks and auditors conducting valuation services for the aforementioned entities. The reasoning behind this focus is that these entities are supposed to perform a much more thorough valuation than banks’ investment analysts do when they regularly

¹ The sorted and categorized literature database is available from the author upon request (compare Appendix D).

² As will be presented in chapter 6, venture capitalists use diversification of their investments as instrument to minimize risk. Nevertheless, they conduct thorough valuations because they still invest critical shares of their investment capital in single investments.

analyze firms and industries to derive buy, hold, or sell recommendations for publically listed shares.

Existing research in the light of the focused research area can be summed up in the four following aspects that also point out the research gap:

- (1) Focus on acquisitions and strategic investments rather than on valuation
- (2) Focus on theoretical valuation models rather than on valuation practices
- (3) Focus on financial analysts' valuation practices rather than on valuations for strategic investments
- (4) Focus on a highly conceptual theoretical link between innovation and valuation rather than on empirical research

Focus on acquisitions and strategic investments rather than on valuation

The performance of M&A for acquiring firms has been widely investigated (Agrawal et al., 1992; Antoniou, Petmezas, & Zhao, 2007; Barney, 1988; Capron & Pistre, 2002; Capron & Shen, 2007; Harrison, Hitt, Hoskisson, & Ireland, 1991; Healy et al., 1992, 1997; Ingham, Kran, & Lovestam, 1992; Jensen & Ruback, 1983; S. N. Kaplan & Weisbach, 1992; King et al., 2004; Lubatkin, 1983; Straub, 2007; Weber, Reichel, & Tarba, 2006; Zollo & Meier, 2008). Researchers focused on the circumstances under which acquiring firms are able to receive short-term or long-term performance gains. Additionally, the market for corporate control and firm innovation (M. A. Hitt, Hoskisson, Johnson, & Moesel, 1996) and the innovation performance of acquiring firms (Ahuja & Katila, 2001) have been investigated by fellow researchers. All of the mentioned research focuses on the outcome of M&A transactions, but neither on the process of the whole transaction nor on the processes of M&A decision-making or valuation.

Focus on theoretical valuation models rather than on practices

A wide spectrum of publications on the topic of firm valuation methodology (Damodaran, 2002, 2009; Koller et al., 2005; Penman, 2006b; Rappaport & Mauboussin, 2002) exist, but empirical research in this area has rather been on their performance in the stock market (Henschke, 2009; S. N. Kaplan & Ruback, 1995; Penman & Sougiannis, 1998; Schreiner, 2007) than on practices in the strategic investment context.

Focus on financial analysts' valuation practices rather than on valuations for strategic investments

Little research exists on the topic which valuation models professional valuation practitioners use and why they use them. BRADSHAW (2004), DEMIRAKOS, STRONG, & WALKER (2004), SCHREINER (2007), and HENSCHKE (2009) investigated, which models financial analysts use. IMAM, BARKER, & CLUBB (2008) additionally investigated reasons, why investment analysts use certain methods, but also state that research on this topic is sparse, even for the context of financial analysts (Imam et al., 2008, p. 505). All of the previously mentioned investigations focus on financial analysts using valuation models to derive stock buy/hold/sell recommendations.

GRAHAM & HARVEY (2001) investigate the use of corporate finance techniques such as (net) present value, CAPM, and other investment decision-making techniques in CFOs' daily businesses. Similar investigations are conducted by researchers investigating strategic investment decisions (Alkaraan & Northcott, 2006; Arnold & Hatzopoulos, 2000; Farragher & Kleiman, 1999; R. H. Pike, 1988; R. Pike, 1996; Sangster, 1993).

This existing research completely leaves out firm valuations in M&A, venture capital, and private equity contexts, which are neither financial analysts' nor CFOs' daily business.

Focus on theoretical link between innovation and valuation rather than on empirical research

A strong theoretical link exists between innovation theory and valuation theory on a very high conceptual level (compare chapters 3.1 and 3.4). But with regard to valuation methodology or practices only few approaches exist (Damodaran, 2009; Granig, 2007). For example, DAMODARAN conceptualizes the valuation of young firms and separates cash flows from existing assets from cash flows from future assets or investments in his valuation models. GRANIG applies valuation methodologies to the valuation of innovation projects.

On an even more conceptual level, one can link valuation theory and innovation theory using corporate finance aspects of a theory of the firm. As ZINGALES states in his seminal *Journal of Finance* article "In search of new foundations" (2000), corporate finance and its three major areas, valuation being one of them, need to be tied closer to an accurate theory of the firm. The characteristics of many non-industrial firms represent rather collaborating smaller entities with intangibles as most important assets than they represent tangible, asset-intensive, and highly vertically integrated entities. ZINGALES understands hidden or intangible organizational

assets as important resources and the capabilities to capture growth opportunities as critical for the success of a firm. Thus, innovation theory based on the foundations of the resource-based view should be a useful perspective to answer the fundamental question in this context: Which perceived characteristics of a firm should be analyzed to determine the capabilities of firms to capture these new profitable growth opportunities? How should they be appraised?

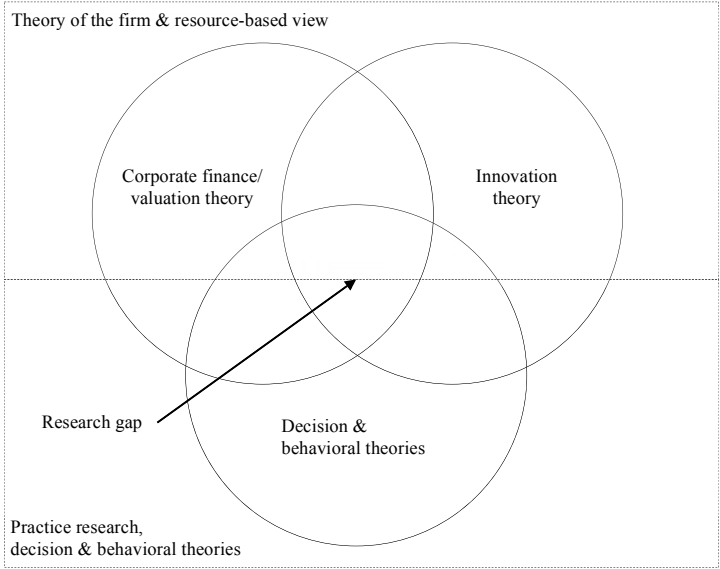


Figure 1. Research Gap

To conclude, this investigation closes a research gap that exists between valuation theory, innovation theory, and practice research/decision theory (compare Figure 1).

2.3 Research Objectives

Taking into account the previously depicted research gap, my investigation focuses on the practices to appraise a firm’s innovation potential in the context of strategic investments and acquisitions. As the previous literature research has shown, the field of practices has not been covered by existing literature and therefore can only be guided on a framework-level by theory.

The focus of the investigation leads to the following research questions to extend available theory:

- (1) What is the *relationship between a firm's valuation and its innovation potential* based on existing theory?
- (2) What *methodologies and relevant information does theory suggest* with regard to the appraisal of innovation potential for different firm types ranging from idea to mature firms?
- (3) What do practitioners do to value a firm's innovation potential for different firm types?
 - a. What *valuation methodologies and practices* do equity and strategic investors use to value the innovation potential of firms they want to fund or acquire?
 - b. Which *information* do they use as input for these models?
 - c. How is this information *translated or interpreted* to be useful as inputs required by mathematical valuation methodologies?
- (4) How can the differences between the innovation potential appraisal of different firm types and between theory and practice be used to *extend existing theory*?

An additional aspect of this work is to give more descriptive insights in the thinking and practices of firm valuers. Thus, many original statements are presented in chapter 6.

There exist two fundamental differences to the existing research mentioned in chapter 2.2:

- (1) My research focuses on *equity and strategic investors* in contrast to focusing on financial stock market analysts. Additionally, I also focus on the *information* considered as inputs to the used valuation models.
- (2) My research focuses on the *valuation of the innovation-related influence on a firm's value* in contrast to the valuation approaches used to appraise a firm as a whole.

These differences from the existing research constitute a research gap of not yet investigated relationships, which is, also because of its strong link to the resource-based theory and one of its major research fields, the valuation of resources, valuable to fill. This investigation is elaborating and complementing existing research on the resource-based view and explaining gaps and links between different fields of related theories, e.g. innovation theory, valuation theory, strategy as practice, decision theory, and the theory of the firm. By this approach to consider different existing theories combined with an explorative investigation of practices, my research “draw[s] from the several substantive areas that are frequently reflected in a given dai-

ly reality” (Suddaby, 2006, p. 635) and avoids the danger that prior knowledge contaminates the researcher’s perspective or forces the researcher to unconsciously test hypotheses (Suddaby, 2006).

2.4 Research Strategy and Process

Based on the research gap and objectives depicted in the previous chapters, the overall research strategy was to combine existent theory with empirical insights about practices and extend existing theory thereafter (compare Figure 2).

As first step, I investigated the existing conceptual and empirical research by the means of *literature research* to identify and specify the research gap and depict theoretical foundations of the current investigation.

The following literature is considered in this dissertation:

- (1) Existing conceptual and empirical research on innovation, innovation capability, innovation management & controlling, innovation performance, and innovation assessments
- (2) Existing conceptual and empirical research on mergers & acquisitions, technology acquisitions, post merger integration, and company valuation methodologies
- (3) Explorative empirical research on practitioners’ use of company valuation methodologies, constraints of their valuations, data gathering and estimation, and implications for firm valuation.

The literature research was conducted by searching in peer reviewed and ranked journal publications in the three respective areas accompanied by valuation standard literature, e.g., DAMODARAN (2002) or KOLLER ET AL. (2005), and more practice oriented studies and innovation assessments.

Based on the identified and specified research gap, I chose a contingency approach to investigate theoretical implications, guide the empirical investigation of valuation practices, and facilitate a comparison of theory and practices. A typology is a useful tool in scientific research to investigate phenomena, which are contingent on their contextual embedment. In contrast to a taxonomy or classification, the *investigated types and their characteristics, named dimensions, are derived from existing theory* and are not clustered from empirical data as for example BENNETT & ELMAN state:

What differentiates a typological theory from a taxonomy designed to define types or classify cases is its theoretical content. The dimensions of the property space associated with a typological theory are provided by the theory's explanatory variables, and the content of the cells comes from the logic of the theory. (Bennett & Elman, 2006, p. 465).

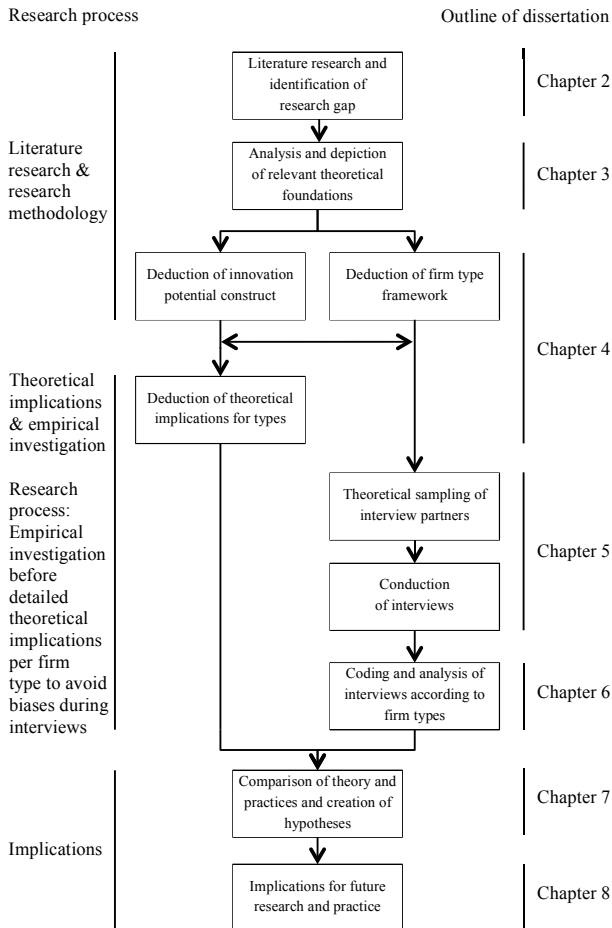


Figure 2. Research Process & Outline of Dissertation

Thus, a typology on the one hand provides a guiding framework to structure an investigation:

If an investigator wishes to compare and contrast two or more different types of intervention, the study must be guided by clearly defined puzzles, questions, or problems that may be different from or similar to those of a study of a single subclass. (George & Bennett, 2005, pp. 78–79)

And on the other hand it facilitates comparing qualitative empirical data with existing theory and enables comparative empirical analysis. The contingency approach and the empirical comparative analysis were brought together by, first, defining firm types and content dimensions and, second, by conducting a theoretical sampling based on the firm types.

The empirical investigation itself was conducted by using comparative case study analysis utilizing expert interviews as cases. Case study research is recommended as complementary empirical research strategy to investigate contingent relationships:

Case study researchers generally sacrifice the parsimony and broad applicability of their theories to develop cumulatively contingent generalizations that apply to well-defined types or subtypes of cases with a high degree of explanatory richness. Case study researchers are more interested in finding the conditions under which specified outcomes occur, and the mechanisms through which they occur, rather than uncovering the frequency with which those conditions and their outcomes arise. (George & Bennett, 2005, p. 31)

Details with regard to the empirical research strategy, design and process are depicted in chapter 5.

The last step in the research process was deriving hypotheses to extend theory on the one hand based on a comparison between the types in the typology and on the other based on a comparison between theory and practice. To enable the latter comparison, detailed theoretical implications per firm type were derived from valuation and innovation theories after the empirical research was conducted. The hypotheses are based on and depicted according to explaining the “why” of the derived relationships and not only the existence of the relationships to provide meaningful extensions to existing theory (“explain the arrows, not the boxes”) (Thomas, Cuervo-Cazurra, & Brannen, 2011).

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Buchmann, J.A.

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