Franziska König

The Uncertainty-Governance Choice Puzzle Revisited

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The Uncertainty-Governance Choice Puzzle Revisited

Predictions from Transaction Costs Economics, Resource-Based Theory, and Real Options Theory

With a foreword by Prof. Dr. Thomas Mellewigt

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FOREWORD

Franziska König examines the nature and effects of uncertainty on governance choice of firms. Despite an innumerable amount of theoretical and empirical efforts that have been undertaken until to date, the relationship between uncertainty and governance choice remains nebulous. On the one hand, there are numerous theoretical approaches suggesting different implications regarding governance choice. For example, while in the face of uncertainty, transaction costs economics (TCE) favors hierarchical governance, real options theory (ROT) promotes more market-based governance solutions. On the other hand, empirical research has been adopting an innumerable amount of different operationalizations and has presented in part divergent empirical results. As a consequence the strategic management literature has not been able to advise management practice on which governance form to choose in the face of different uncertainty problems. Franziska König approaches the theoretical and empirical puzzle in a systematical way and her results materially advance current research.

Firstly, Franziska König suggests a more formal, circumstance-based categorization of uncertainty-governance choice relationships that allows integrating different theoretical explanations and resolving empirical anomalies. Subsequently, she adopts a multi-dimensional, circumstance-based lens to investigate the contributions of three theoretical frameworks, i.e., TCE, Resource-Based View (RBV), and ROT, and therewith to gain a deeper understanding of uncertainty-governance choice problems. Secondly, Franziska König provides a thorough examination of the state-of-the-art regarding empirical research. She reviewed 29 of the most cited journals in strategic management, marketing, and economic organization over two decades and identified 84 empirical studies including 240 single empirical tests on uncertainty-governance choice relationships. A vote-counting method was applied to assess the average empirical support for each of the three theories covering 11 different theoretical propositions. Results not only detect the empirical relevance of different theoretical conclusions but also provide interesting insights: For example, the “classical” TCE hypothesis which suggests a moderating role of uncertainty on the relationship between asset specificity and governance choice received only below average empirical support. During the second part of her thesis, Franziska König moves beyond the specification of single theoretical contributions and reconciles the three chosen theoretical perspectives in order to resolve overlapping and in part competing theoretical predictions. More specifically, she examines three, to date unsolved, theoretical debates on uncertainty-governance choice relationships. A first theoretical debate focuses on the relative importance of maintaining control versus operational flexibility in the presence of environmental change and thereby confronts the more traditional TCE-view with new considerations from a real options perspective. In resolving the second theoretical debate, Franziska König reconciles TCE and resource-based arguments on the management of ambiguity while elaborating on different governance mechanisms (control versus coordination) that are suggested to address ambiguity efficiently. A third theoretical debate takes up the inclusion of real options-based considerations on maintaining operational flexibility to the management of ambiguity. Across the three debates, Franziska König derives 16 specific research hypotheses. These are tested empirically by adopting a policy-capturing method, which is particularly suited to examine distinct and interacting decision problems. While the method is well-known in areas such as HRM or Marketing, applications to strategic management research have been rare. In order to enhance external validity a cross-industry sample of senior executives with significant tenure in the area of governance choice was identified. In total, 34 survey-respondents provided 544 individual governance choice observations (16 scenarios per person). The study found support for 13 of 16 hypotheses and provides a large number of extremely interesting findings. For example, this study is one of the first showing a moderating influence of real options on the relationship between uncertainty, specificity, and the choice of alliance governance. Overall, theoretical and empirical results of this thesis show that not a single source of uncertainty is the decision problem but that uncertainty in relation with certain contingency factors leads to different adaptation problems for which firms find governance solutions.

In her dissertation Franziska König focuses on a research question which is highly relevant for theory and practice. Her research project could be accomplished with phenomenal success due to an outstanding theoretical part, the impressive state-of-the-art overview as well as an innovative empirical research method contributing with new insights to the field. Excerpts of the work have already passed the market test: Her paper "The Uncertainty-Governance Choice Puzzle Revisited – Predictions from Transaction Costs Economics, Resource-Based Theory, and Real Options Theory" was presented at the Strategic Management Conference in Orlando, USA, in 2005. Overall, Franziska König wrote an outstanding dissertation thesis that fully meets the international standards of rigor and relevance. I wish her numerous readers in academia as well as management practice. In my opinion she deserves it.

Univ.-Prof. Dr. Thomas Mellewigt

PREFACE

"It is a world of change in which we live, and a world of uncertainty. We live only by knowing something about the future; while the problems of life, or of conduct at least, arise from the fact that we know so little." (Frank Knight in "Risk, Uncertainty, and Profit", 1921: 199)

Over the past years that I have been working on this dissertation, I learned that there are multiple facets of *uncertainty* and different ways to cope with it. The development of the doctoral thesis itself was accompanied by a number of uncertainties that kept me up at night but pushed me to find solutions. Those theoretical perspectives that I employed in investigating the research question provide with different resolution strategies: You can try to reduce uncertainty endogenously through gathering information and building better knowledge (resource-based theory), you can reduce it by working with extensive control mechanisms (transaction costs economics), or you may exploit uncertainty by hedging on optional investment strategies (real options theory). I experimented with the three different resolution strategies: Uncertainty, whether my research question would meet demands in relevance and contribution, I could reduce through extensively reading the literature and by frequently gathering feedback across several research seminars and academic conferences. But even though you may have determined a highly relevant research question, still, uncertainty remains whether you have found a conclusive approach of answering to it. Therefore, I thoroughly analyzed the "state-of-the-art" using the outcomes to control and to reassure my own conclusions. Last but not least, I created options by investing into multiple theoretical lenses in order to reduce uncertainty about having ignored important facets of the research phenomenon. Looking back, it may have been the specific mixture of those strategies that enabled me to successfully finish my doctorate at the Freie Universität Berlin in April 2008. But without the support and guidance of a number of people I could never have walked the way as I did.

My deep gratitude goes to my doctoral thesis supervisor, Prof. Dr. Thomas Mellewigt, whose continuous encouragement and inexhaustible enthusiasm coupled with an ambitious objective setting to his doctoral students (here, I want to remember on a slide called "Hawai 2005") enabled me to reach results that I would not have thought of when I started. I am particularly grateful that he pushed me to take advantage of presenting my ideas at various international conferences through which I gathered valuable feedback and really felt participating on the state-of-the-art in my field. I want to thank my doctoral thesis referee Prof. Dr. Jörg Sydow for his guidance and valuable feedback, in particular, on the theoretical portion of my thesis. The way of looking into academic research that he already provided us during my graduate studies was fundamental to the research progress I made. The team spirit and mutual support among our team of doctoral students at Prof. Mellewigt's chair really has been an anchor during these years. I thank you all for so much fun that we had together! My special gratitude appertains to Katja Nothnagel for her help in the revision stage and to Ingo Weller for his patience while digging together into various details of multi-level models and sub-group analyses in logistic regressions. Sabine Schoeller from Gabler deserves my thanks for her editorial assistance in finalizing this book. Furthermore, I wish to thank Dr. Karl-Peter Merz for looking at my research design with the lens of an experienced manager and deep subject-matter-expert to ensure a valid empirical approach. Many thanks go to the group of management professionals who supported my empirical study in patiently executing numerous study cases. I hereby want to thank the "Deutsche Schmalenbachgesellschaft", in particular, the members of the research teams "M&A" as well as "Organization" for their tremendous support during the development of the research design.

I owe so many thanks to my colleagues for allowing me to work in a flexible mode and for the backup they provided me through all the time. My special thanks are devoted to Dr. Stefanie Krauth who has been so much supportive of my "two-track career", both within our firm and the academic world. Along all paths she has been approachable for me in a way that goes far beyond a simple colleague relationship.

Finally, I wish to express my biggest thanks to my whole family. Deep gratitude I owe to my Mum whose continuous encouragement and support has been of such an inexpressible value for me. Stefan, my brother, earns my thanks for having burned the midnight oil while reviewing my empirical research design. My deepest acknowledgement and thanks I dedicate to Christian, my husband, who has been standing by me through all heights and depths, encouraged me with inextinguishable optimism and has been ready for talking about even marginal issues at any time (at day and sometimes even during night). And last but not least, I thank my little son, Carl Lennard, who patiently has been waiting with joining our world just two weeks *after* his Mum passed the final defense of her doctorate.

Franziska König

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ABBREVIATIONS

CAPM	Capital Asset Pricing Model
EPS	Earnings per Share
LPM	Lower Partial Movements
OLS	Ordinary Least Square
PC	Policy-Capturing
R&D	Research and Development
RBT	Resource-based Theory
ROT	Real Options Theory
TCE	Transaction Costs Economics

1 INTRODUCTION

"...the nature of the relationship between uncertainty and vertical integration has proved to be somewhat of a theoretical and empirical puzzle." (Sutcliffe and Zaheer, 1998: 1)

1.1 Problem Statement

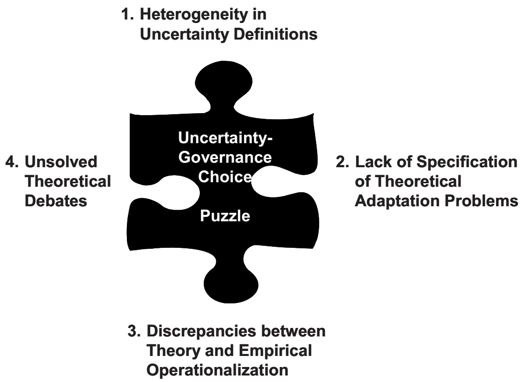
How does uncertainty affect decisions about the organizational design of a firm's tasks? Despite an innumerable amount of theoretical and empirical efforts across several scholars of economic organization, management, and human behavior being devoted to a thorough understanding of the nature and effects of uncertainty on organizations and their performance (Buchko, 1994), yet, we still do not know. More general, the question appears to be inevitably linked to the objective of enhancing an organization's adaptability. Organizational theories are built on the common ground that adaptive competencies and success depend on the fit between an organization's design and a number of environmental factors. One pivotal environmental determinant is uncertainty. A specific field of organizational research focuses on the effect of uncertainty on governance decisions and subsequent performance implications. Yet, these relationships represent a sort of puzzle, being accompanied with controversial theoretical accomplishments and empirical evidence (Leiblein, 2003; Mahoney, 1992; Sutcliffe and Zaheer, 1998). For example, in the tradition of transaction costs economics (henceforth, "TCE"), which is the most cited theoretical perspective on governance decisions, the problem of uncertainty is inevitably linked to the emergence of opportunism problems. The theory suggests an extension of hierarchical boundaries in order to conduct efficient control on potential opportunistic behavior (Williamson, 1985, 1991). Historically, a different focus has been set by papers drawing on strategic management theory, particularly in the context of international market entry. These, in contrast, emphasized the value of maintaining flexibility in the presence of uncertainty through a confinement of hierarchical boundaries and the use of low-cost market governance or hybrid governance forms (e.g., Balakrishnan and Wernerfelt, 1986; Harrigan, 1985). Such flexibility-driven objections to the traditional TCE rationale recently have been revitalized and further substantiated by drawing on real options theory (henceforth, "ROT"). ROT has been increasingly applied to strategic management questions as it provides a more rigorous economic assessment of the value of flexibility under uncertainty (Reuer, 2002). In the realm of governance research, real options-based explanations have been applied to empirical evidence of firms preferring the flexibility of market-based organizational designs in order to efficiently cope with environmental changes that cause uncertainty within the firm (e.g., Barney and Lee, 2002; Folta, 1998; Folta and Leiblein, 1994; Folta and Miller, 2002; Foss, 1998; Kogut, 1991; Roemer, 2003; Santoro and McGill, 2005). While both, the transaction costs-based rationale of governance choice and the real options logic, have received empirical support, further research is required to specifically determine the boundaries of these explanations under uncertainty. Furthermore, the governance literature has been significantly influenced by arguments elaborating upon resource-based theory (henceforth, “RBT”), and, respectively, knowledge-based theories (henceforth, “KBT”). These jointly emphasize the importance of resource- and firm-level attributes in organizational adaptation processes. In this theoretical context, research interest has been shifted to sources of uncertainty that reside *within* the firm as well as to respective firm competencies and mechanisms to cope with such uncertainties. For example, proponents of KBT discuss uncertainty emerging along the transfer of knowledge within and across firm boundaries. Kogut and Zander (1993 and 1996) as well as Nickerson and Zenger (2004) materially advanced a theoretically independent, knowledge-based view on the distinct capabilities of organizations in resolving uncertainty problems that arise from the ambiguous nature of knowledge. Specifically, firms have been argued to employ a higher level of coordination mechanisms enabling them to cope with such uncertain challenges more efficiently than markets. Unfortunately, the inclusion of knowledge-based arguments has long been poorly conceived from a theoretical perspective and, therefore, could be convincingly contested (Foss, 1996; Mahoney, 2001). In particular, a number of studies in the context of knowledge-specific uncertainty problems are rather availing of a transaction costs-based logic. In order to protect a firm’s specific knowledge from opportunistic misappropriation by the exchange partner, firms are supposed to prefer more control through hierarchical governance (e.g., Erramilli and Rao, 1993; Novak and Eppinger, 2001; Oxley, 1999). The incidence of competing conceptual explanations for the superiority of firm governance in the context of knowledge-based uncertainty problems increases the need for future research that conceptually and empirically discriminates the opportunism-based from the learning-based logic (Colombo, 2003; Leiblein and Macher, 2005). A third, yet less recognized, stream of the literature emphasizes the upside effects from operating under uncertainty and examines how governance designs can contribute to an exploitation of such upsides. These examinations may provide new insights on the role of governance under uncertainty because, to date, the governance literature has primarily focused on the downside consequences from operating under uncertainty. For example, the early RBT literature has discussed uncertainty, and more specifically causal ambiguity, as one major factor affecting the development of heterogeneous resource profiles of firms.

Uncertainty thereby acts as an isolating mechanism of such heterogeneity and enables firms to create and preserve sustainable rents despite competition (Lippman and Rumelt, 1982). It has been argued that, therefore, a firm's boundaries will be defined so as to embrace sources of rents and to exploit causal ambiguity (Reed and DeFillippi, 1990). With the concept of growth options, ROT revitalizes the notion of growth opportunities in the presence of uncertainty. Research has started to explore those governance mechanisms that help to effectively establish and exercise growth option claims (e.g., Kogut, 1991) and thereby to actively manage uncertainties. However, while real options-based explanations have been found appealing on the one hand, on the other hand, a debate is emerging with regard to the transferability of such arguments into decision contexts where uncertainty resolves more endogenously to a firm's actions, such as in the case of ambiguity (e.g., Adner and Levinthal, 2004; McGrath et al., 2004). The relative importance of different theoretical rationales on uncertainty-governance choice problems if at all has been mostly addressed empirically. However, it is obscured by ambiguous empirical findings. It becomes particularly evident with regard to the diversity of empirical results for the effect of uncertainty on the level of vertical integration (e.g., Balakrishnan and Wernerfelt, 1986; Folta, 1998; Harrigan, 1985; Heide and John, 1990; John and Weitz, 1988; Majumdar and Ramaswamy, 1994; Robertson and Gatignon, 1998; Sutcliffe and Zaheer, 1998; Walker and Weber, 1987). Facing such ambiguous results, some studies even have questioned the discriminating power of uncertainty with regard to the choice between hierarchies and markets (e.g., Ariño and Reuer, 2004; David and Han, 2004). Yet, in other studies, uncertainty has been found to be a significant empirical determinant of the choice between different governance designs, especially in the context of strategic alliances (Gulati, 1995; Oxley, 1997, 1999; Santoro and McGill, 2005). The theoretical and empirical ambiguity surrounding the relationship between uncertainty and governance choice is reflected in a lack of clear managerial prescriptions on how to design governance in order to efficiently address different forms of uncertainty. To date, the incidence of multiple conceptual rationales currently rather draws a curtain over the role of uncertainty in firm's organizational decisions. At the same time, it has been argued that a multi-theoretical perspective on governance choice problems may considerably advance the understanding of firm's governance decisions (Foss, 1999; Leiblein, 2003). Considering that managing uncertainty efficiently has become a major topic, both in theory as well as in managerial practice, it should be an important conceptual and empirical task to disentangle multiple uncertainty-governance choice rationales more precisely[1]. Addressing this challenge

1 For example, the ROT literature has started to examine in more detail the inherent tension between

represents the major objective of this thesis. More specifically, it will be examined *how different uncertainty problems separately and jointly affect the choice of governance, especially in the context of strategic alliances*. Based on a comprehensive review of the literature, this study argues that the current puzzle of uncertainty-governance choice relationships exists for four reasons (Figure 1):

Figure 1 Determinants of the Uncertainty-Governance Choice Puzzle



First, the literature does not dispose of a unified understanding of uncertainty, i.e., there is *significant heterogeneity in uncertainty definitions* and a high level of conceptual disagreement with regard to the major dimensions of uncertainty. Almost as numerous uncertainty terms are adopted as there are potential sources of uncertainty in the environment of a firm, such as market uncertainty, price and demand uncertainty, technological uncertainty, macro-economic uncertainty, political uncertainty, legal uncertainty, and so forth. Other definitions concentrate on the nature of uncertainty, such as volatility, ambiguity, or complexity. The first approach, which is defining uncertainty with an indication of its source or adopting a source typology (e.g., Miles and Snow, 1978; Priem et al., 2002), most probably reflects a relative simplicity in empirical data access. This approach has become so popular that to date an innumerable amount of "source-based" uncertainty categorizations exists. The governance literature has applied such "source-based" uncertainty categorizations, too, including well-known constructs, such as behavioral uncertainty, monitoring problems, technological, and demand uncertainty (e.g., Das and Teng, 1998, 1999; Geyskens et al.,

committing to growth while simultaneously preserving flexibility to abandon commitments at low costs (Folta and O'Brien, 2004).

2006; Walker and Weber, 1987, 1988). Despite the popularity of these concepts, their empirical "success", in terms of discriminating distinct uncertainty problems related to a firm's governance choice, yet appears to be questionable. Empirical studies have provided with mixed conclusions on the management of uncertainty. More general, the source-based definition concept remains one-dimensional. Others have argued that uncertainty affects managerial decisions across several dimensions (e.g., Duncan, 1972; Milliken, 1987). Following such thoughts, a couple of papers within the governance literature have examined different uncertainty dimensions, such as diversity, ambiguity, or volatility (e.g., Carson et al., 2006; Klein et al., 1990; Meuleman et al., 2006)[2] or endogenous and exogenous uncertainty forms (e.g., Cuypers and Martin, 2006; Folta, 1998). Although empirical results of such approaches seem to be promising, as yet, the relative importance of other uncertainty dimensions vis-à-vis the source-based conceptualization neither has been thoroughly determined nor have these dimensions been integrated. Also, surprisingly little consideration has been given to the distinction between risk and uncertainty[3], although, historically, this dichotomy has been considered important to an understanding of economical problems (Knight, 1921). Definitional problems are accompanied by a long lasting discussion about whether uncertainty can be empirically assessed with objective data (i.e., by observing environmental characteristics) or whether it requires perceptual measures, given that uncertainty is an individual, perceptual construct (Buchko, 1994). For example, Milliken (1987: 135) asserted that "it is not change per se (…) that creates uncertainty about the environment; rather, it is unpredictable change". The notion of predictability just adds another potential dimension of uncertainty problems that needs to be more carefully explored with regard to its conceptual meaning in different theoretical perspectives. Overall, research has adopted a high level of discretion in defining and operationalizing uncertainty while often lacking a respective theoretical foundation. More specifically, it has not yet developed conceptual categories of uncertainty that relate to distinct uncertainty-governance choice problems and can be adopted across different empirical settings (Christensen et al., 2002). Formal, problem-based categorizations of uncertainty would consider particular contingencies on which more generally defined cause-effect-relationships may depend and are able to integrate empirical anomalies (Christensen et al., 2002).

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[2] For example, Carson et al. (2006) presented empirical evidence that volatility and ambiguity as distinct, natural forms of uncertainty differently interacted with opportunistic behavior in alternative contractual regimes.

[3] For example, mostly similar meanings are ascribed to "behavioral uncertainty" (Williamson, 1985) and "relational risk" (Das and Teng, 1998).

Second, *theoretical concepts of the relationship between uncertainty and governance choice are poorly specified*. Although the theoretical basis is broad, the particular role of uncertainty in governance decisions remains obscure. More specifically, it is reflected in a) a lack of understanding of what the unique contribution of each theory is to an understanding of uncertainty-governance choice problems and b) significant intra-theoretical, conceptual dissent with regard to the influence of uncertainty on governance choice. For example, although TCE has built the explanation of firm existence on the notion of market failures in the presence of behavioral uncertainties, i.e., where markets do not provide sufficient control on opportunistic behavior and, therefore, raise transaction costs, under its tent papers have also examined the flexibility advantages of market governance (e.g., Aulakh and Kotabe, 1997; Contractor and Kundu, 1998). Moreover, the TCE literature employs various concepts of uncertainty, including exogenous disturbances, monitoring problems, or behavioral uncertainty, whose relationship to distinct adaptation problems and relative importance has not yet been clarified (Sutcliffe and Zaheer, 1998). Within RBT, uncertainty has been often employed as a major, yet exogenous, determinant of differences in firm capabilities (Barney, 1991). The latter have been argued to affect governance choice. Yet, different and in part contradictory arguments can be found with regard to the governance response of firms to uncertainty problems. For example, while proponents of KBT highlight firm capabilities in endogenously resolving ambiguity problems resulting from the complex nature of knowledge-building processes (e.g., Nickerson and Zenger, 2004), others have pointed out that because of such ambiguities, low-cost market governance might be preferred in developing and exploiting knowledge (e.g., Barney, 1999). Furthermore, whereas a number of papers have successfully adopted real options logic to governance choice observations under different forms of uncertainty, at the same time, it has been argued that the real options logic only applies to certain, i.e., exogenous, forms of uncertainty (Adner and Levinthal, 2004; Cuypers and Martin, 2006). Moreover, it has been agreed that ROT can explain how firms actively exploit uncertainty; yet, research has discussed different strategies. While some papers argued the superiority of flexible, low-cost market governance (e.g., Foss, 1998), ROT has been also used to describe sequential stages of equity investments in governance decisions (e.g., Folta, 1998; Kogut, 1991). Those different conceptual rationales have been mostly adopted in isolation. Empirical anomalies have been ascribed to particular sources of uncertainty or other factors than uncertainty while the incidence of different adaptation problems under uncertainty has been often ignored. Hence, a substantial task for future research is the specification of distinct uncertainty-governance choice *problems*, i.e., a more formal categorization of the phenomenon (Christensen et al., 2002).

Third, significant *discrepancies between theoretical concepts and their empirical operationalization* can be observed. While theoretical uncertainty-governance choice concepts apply different assumptions of uncertainty along various problem dimensions, empirical research adopts an attribute-based focus on uncertainty, i.e., mostly defines and measures uncertainty one-dimensionally with an indication of one particular attribute. It has two implications: One result is a sizeable heterogeneity in uncertainty definitions and operationalizations that are adopted in empirical research with unclear links into distinct adaptation problems. A second consequence is that other important theoretical dimensions of uncertainty-governance choice problems have been neglected. Christensen et al. (2002) point out that such attribute-based categorization schemes often compete and overlap, since there are so many dimensions of phenomena. And indeed, the definition of uncertainty via its particular source does not offer an unambiguous link into different theoretical problems. In other words, with regard to a particular source of uncertainty, various theoretical rationales on governance choice have been developed. Not surprisingly, the attribute-based approach often has yielded mixed empirical success in describing distinct uncertainty-governance choice problems. Empirical anomalies could not be integrated into theoretical feedback. Following the discussion of Christensen et al. (2002), in order to arrive at a more unified understanding of uncertainty-governance choice relationships, research needs a) to overcome the empirical heterogeneity by developing conceptual classifications of uncertainty problems, b) to incorporate feedback from the detection of empirical anomalies into further refinements of conceptual uncertainty-governance choice classifications, and c) to adopt adequate measures for uncertainty problems by considering key theoretical dimensions.

Fourth, reflecting the lack of conceptual specification, there are still *unsolved theoretical debates* between overlapping and in part competing theoretical explanations for uncertainty-governance choice relationships. For example, it remains conceptually and empirically unresolved, whether at a high level of environmental change firms do better with extending or with confining their level of vertical integration. The first strategy would be suggested by TCE for control efficiency reasons; the second approach follows the logic of ROT, which emphasizes the value of flexibility. Also, it remains unclear whether hierarchies are superior because they enable efficient control on sources of uncertainty (TCE rationale) or because they include specific capabilities in directly resolving uncertainty (RBT rationale). As of to date, research has mostly relinquished the final decision about the relative importance of different theoretical rationales to empirical observations. However, inconsistent and in part contradictory empirical results could not yet contribute to the puzzle's resolution. Prior to continuing with empirical efforts, it will be important to carefully reconcile different theoretical perspectives on uncertainty-governance choice problems. A conceptually integrated, multi-theoretical perspective facilitates the development of richer descriptions of firms' governance decisions (e.g., Barney and Lee, 2002; Colombo, 2003; Cuypers and Martin, 2006; Santoro and McGill, 2005)[4]. The before depicted theoretical and empirical deficits of current research provide the underlying motivation for this thesis' conceptual efforts that are outlined in the following section.

1.2 Objectives of the Thesis

By exclusively focusing on the phenomenon "uncertainty" as one pivotal concept out of various determinants of governance choice, this thesis – apart from the "mainstream" of governance research – can contribute with a stronger conceptual rigor in analyzing uncertainty in the context of governance choice problems. This rigor is achieved by a) examining *various dimensions* of uncertainty-governance choice problems and b) considering *multiple theoretical perspectives*. As such, this thesis challenges and advances extant theoretical and empirical work across several fronts so as to shed light on the uncertainty-governance choice puzzle. There are two major steps required towards resolving this puzzle: First, we need a more thorough ***specification*** of theoretical uncertainty-governance choice concepts in the light of different adaptation problems. Second, a ***reconciliation*** of different theoretical explanations may help to resolve empirical anomalies and to arrive at enriched descriptions of uncertainty-governance choice problems. These two different, but interlinked, conceptual tasks will be addressed in this thesis and provide the conceptual framework for the following discussions.

Part I: Specification of Theoretical Uncertainty-Governance Choice Problems

One major objective of this thesis is to overcome the heterogeneity of uncertainty definitions and operationalizations that is driven by an attribute-based focus of current research towards a more formal, circumstance-based categorization of uncertainty-governance choice problems

[4] For example, Folta (1998) provided evidence of the benefits of integrated theoretical examinations. He found the costs of prematurely committing resources under uncertainty – as emphasized from a real option-based perspective – sometimes offsetting the (transaction cost) advantages of hierarchies, as being promoted in the TCE literature.

that allows integrating different theoretical explanations and resolving empirically observed anomalies. The literature agrees that examining the adaptive capacity of organizations under uncertainty provides a solid conceptual fundament for specifying various theoretical uncertainty-governance choice concepts (Gulati et al., 2005). Chapter 2 respectively allocates the research question relative to the more principal challenge of organizational adaptation in response to uncertainty. More specifically, when looking back into the literature, the relationship between uncertainty and governance choice represents a particular adaptation problem (Hayek, 1945; Williamson, 1985). Governance scholars, and especially the leading TCE perspective, have specified the decision problem to the choice of a governance arrangement that most efficiently serves adaptation needs in the presence of uncertainty. Multiple adaptation problems have been discussed. However, the multi-dimensionality of uncertainty has aggravated the development of unambiguous links between different uncertainty forms and governance choice. A first contribution of this thesis is the development of a unified approach in defining uncertainty-governance choice problems (Chapter 2.2) that considers various problem dimensions and provides the fundament for a more formal categorization (Chapter 4.1.1). The analysis scheme is built on a concept that has been developed outside the realm of governance research. It argues uncertainty to influence managerial decisions along multiple dimensions, including a state, effect, and a response dimension (Milliken, 1987). The operationalization of such a multi-dimensional view on uncertainty problems is discussed in the context of governance choice (Chapter 2.2.3). Subsequently, this multi-dimensional lens is applied when discussing the contributions of three theoretical frameworks, including TCE, RBT, and ROT, to an understanding of uncertainty-governance choice problems (Chapter 2.3). More specifically, it is asked what are the sources of uncertainty (state dimension), what are the potential effects on the firm (effect dimension), and how it can be resolved by employing particular governance functionalities (response dimension). The approach allows identifying and defining distinct adaptation problems for which the selected theories provides with unique explanations. Moreover, the analysis also demarcates the boundaries of each theoretical concept and detects those propositions that are not theoretically stringent. The conceptual discussion is succeeded by a focused, quantitative examination of recent empirical studies in chapter 3 with the objectives of a) providing an overview of how empirical work fits into the beforehand specified theoretical concepts (i.e., an operationalization analysis) and b) assessing the relative empirical support of the theoretical concepts (i.e., by applying a vote-counting analysis). This two-stage approach is particularly suited to exploratively disentangle the empirical puzzle rather than assessing the level of confirmation for “known relationships” for which other, more advanced meta-analytical approaches might be more suitable. Across both stages of analysis, potential obstacles and discrepancies in empirical operationalizations are detected that potentially affect the empirical support. Recommendations are derived towards an improvement of future empirical research in order to arrive at a better understanding of the empirical role of uncertainty and its various problem dimensions. There are some similarly systematic, quantitative research reviews including uncertainty and governance decisions in the literature (David and Han, 2004; Geyskens et al., 2006; Krickx, 2000; Zhao et al., 2004). However, these were applying broader research questions whereof uncertainty had been one amongst other determinants and, therefore, do not provide a similar conceptual rigor and depth.

Part II: Reconciliation of Theoretical Uncertainty-Governance Choice Problems

While the first part of the thesis is addicted to a specification of unique theoretical explanations, the second part proceeds with a reconciliation of different theoretical rationales. Because one theoretical perspective cannot cover the entire spectrum of a firm’s adaptation problems, a reconciliation and integration of multiple theoretical explanations can yield richer descriptions of firms’ governance decisions in the presence of uncertainty (Leiblein, 2003). Chapter 4 starts with a comparative overview of those single-theoretical uncertainty-governance choice concepts that have been specified in the first part of the thesis. It concludes with a consolidated framework categorizing multiple, generalizable uncertainty-governance choice relationships that address the more constituent parts of theoretical adaptation problems. This more formal, problem-based uncertainty definition approach helps to discover differences and commonalities of theoretical perspectives while providing a fundament for reconciling these. Moreover, it facilitates the resolution of divergent conceptual contributions and empirical anomalies that have plagued the literature until to date. The incidence of overlapping explanations and contradictory implications on governance choice under uncertainty has heated up several debates. Mostly, such debates have been tried to get resolved empirically. Prior to further empirical examinations, a conceptual resolution carries significant opportunities of arriving at a deeper understanding of governance decisions made under uncertainty. The respective conceptual discussion in chapter 4.2 takes up three theoretical debates employing the governance literature to date, and which are briefly outlined in the following:

Debate One: The Tension between Control and Flexibility

Recently, there has been increasing attention paid to the controversy on the optimal level of hierarchical integration in the presence of environmental change, being arisen from contrary recommendations from a transaction costs- and a real options-based perspective (Folta and Leiblein, 1994; Folta, 1998; Leiblein and Miller 2003; Roemer, 2003). The debate has emerged, since studies drawing on ROT increasingly challenged the transaction cost-based conviction that because of market failures, hierarchical governance would be more efficient to cope with contractual hazards arising under environmental uncertainty. In contrast, real options-based studies provided with strong economical arguments as well as with empirical evidence underlining the flexibility advantages of market-based and hybrid governance forms under uncertainty. More specifically, the debate takes up the question of the optimal level of equity ownership that a firm should invest in the presence of environmental change. Equity ownership, on the one hand, ensures authoritative *control* necessary to manage contractual hazards (TCE argument) but, on the other hand, implies a premature commitment to uncertain investment paths, wherefore the ROT literature argues firms to rather conservatively increase their equity investments under uncertainty in order to maintain *flexibility*. A few empirical studies explored shift parameters that may affect the solution of the trade-off, such as different levels of uncertainty (e.g., Folta and Leiblein, 1994) or the contingency role of specific investments (e.g., Folta, 1998; Leiblein and Miller, 2003). However, conceptual rationales in part had been divergent and empirical results produced some contradictory implications. The debate will be revisited in this study while the potential of ROT in advancing the TCE framework in the context of environmental uncertainty will be explored more thoroughly.

Debate Two: The Relative Importance of Knowledge Colocation and Control

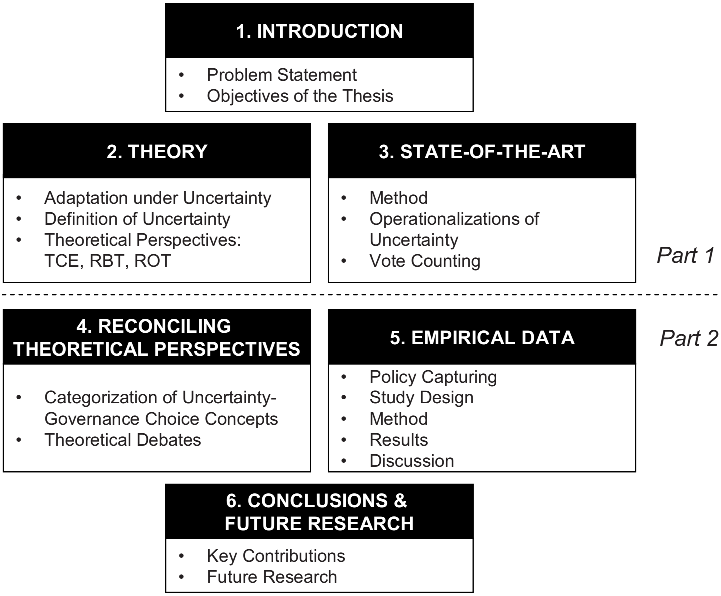
The second theoretical debate can be aligned to a wider controversy between the resource-based and the contractual perspective that continuously discusses the relative importance of a firm's resources and competencies vis-à-vis incentive alignment and the role of property rights in the context of governance choice (Foss, 1999). Specifically to the role of uncertainty, both theoretical perspectives obviously agree on a positive relationship between internal uncertainty sources, such as ambiguity problems, and a preference towards hierarchical governance for efficiency reasons (Colombo, 2003; Leiblein and Macher, 2005; Sampson, 2004). However, taking a closer look, the conclusion on hierarchical governance is being derived for different rationales. TCE asserts that because ambiguity in an exchange leads to serious contractual hazards, there is a strong preference for hierarchical governance because of its *control* properties, or, in other words, because market failures (transaction costs-inefficiencies) in the context of contractual hazards. The debate arose from the objection of knowledge-based researchers, whether such opportunism concerns are the key explanation of the chosen governance form. Instead, they argue the preference results from advantages of hierarchical governance forms residing in an efficient *colocation* of different knowledge sets that facilitates an endogenous resolution of ambiguity. The relative importance of these two theoretical explanations is still under discussion (e.g., Colombo, 2003; Foss and Foss, 2002; Leiblein and Macher, 2005) and will be taken up in this thesis.

Debate Three: The Role of Real Options under Endogenous Uncertainty

A third debate has evolved in the strategic management and also within the governance literature that surrounds the application of real options-theoretical arguments in the context of uncertainty problems that resolve more endogenously (Adner and Levinthal, 2004; Cuypers and Martin, 2006). In general, there is agreement that the adoption of real options-based arguments is appealing for the explanation of flexibility and growth motives in governance decisions (Chi and Seth, 2002; Kogut, 1991; Folta, 1998). However, it also has been argued that there is a risk of too loose applications of ROT that violate its basic theoretical assumptions (Adner and Levinthal, 2004). More specifically, because option pricing models presume uncertainty as an exogenous factor, it has been argued that real option-based explanations cannot be applied to examinations of governance decisions in the context of endogenous uncertainty, such as ambiguity (Cuypers and Martin, 2006). Opponents of this argumentation emphasize that such a confined application precludes valuable heuristics from being applied to an investigation of uncertainty problems (McGrath et al., 2004). Moreover, they can refer to empirical studies showing a limited importance of option pricing models in managerial practice as opposed to the role of a real options reasoning (e.g., Bowman and Moskowitz, 2001). Because empirical evidence exists for the importance of maintaining decision flexibility and exploring growth opportunities under ambiguity, this thesis will explore the potential of integrating real options-based conclusions into the context of adaptation problems under ambiguity.

For the outlined debates, boundaries and overlapping implications of single-theoretical concepts will be identified, before trade-offs are resolved and complementary explanations are identified, which, finally, results in the development of respective research hypotheses. These multi-theoretical examinations are focused to the context of strategic alliances because the interaction between different adaptation models can be particularly observed in the heterogeneity of alliance governance forms (Leiblein and Macher, 2005). While such "hybrid" forms of governance allow addressing a number of controversial organizational challenges (Hennart and Reddy, 1997; Williamson, 1991), they are also accompanied by particular risks (Das and Teng, 1998; Oxley, 1997). The research hypotheses are empirically contested in the remainder of the thesis. Chapter 5 describes the data set and methodological approach as well as the final empirical observations. Primary empirical data are collected through a field-experimental design, which here is a policy-capturing instrument. Policy-capturing has been selected because it is particularly suited to investigate a respondent's information-processing strategies (i.e., "policies of decision-making"). In the context of the research question, the relative influence of different uncertainty, respectively, adaptation problems on the individual's governance decision are explored. The research method facilitates a focused examination of decision-making trade-offs among a given, confined number of decision factors. Notwithstanding the broad application within social sciences, PC methods have been less frequently applied in the field of governance research. However, across a couple of studies, it has been proven to be an effective empirical approach of inferring to the relative importance and interplay of multiple decision parameters within governance decisions, such as driver of equity investments (Kale and Puranam, 2006), determinants of the level of acquisition integration (Pablo, 1994), the level of vertical integration in supplier relationships (Sutcliffe and Zaheer, 1998), or the impact of managerial perceptions and characteristics on the choice of alliances (Tyler and Steensma, 1998). Based on the empirical findings, chapter 6 presents main conclusions and outlines questions for future research. Overall, the dissertation is one among a few contributions applying a focused and, at the same time, multi-theoretical perspective on uncertainty-governance choice problems (besides, e.g., Folta, 1998; Roemer, 2003). The following figure summarizes the respective layout of the thesis (Figure 2).

Figure 2 **Layout of the Thesis**



2 THEORY

"But in attempting to act 'intelligently' we are attempting to secure adaptation, which means foresight, as perfect as possible. (...) In any case we do strive to reduce uncertainty" (Knight, 1921: 238).

2.1 The Central Problem of Organization: Adaptation under Uncertainty

Adaptation has often been highlighted as the central economic problem regarding the choice of organizational designs (Barnard, 1938; Foss, 1996; Hayek, 1945; Williamson, 1991). Constantly and even more rapidly changing business environments, including fast changing customer demands, competitive dynamism, a high speed of technological innovations and shorter product-life-cycles, require a continuous and efficient adaptation of the firm's organizational design and its productive processes in order to survive and to create sustainable competitive advantages. There is a long path of literature being devoted to the question of how organizational entities adapt to their environment, which has been influenced by a number of scholars, ranging from population ecologists (Hannan and Freeman, 1977; 1984), resource-dependence theorists (Pfeffer and Salancik, 1978), the configuration literature (Miles and Snow, 1978; Mintzberg, 1979), the structural contingency school (Lawrence and Lorsch, 1967), Chandler's theory of the diversified firm (Chandler, 1962) to TCE (Williamson, 1975). Most of them are built on the common ground of the *contingency* of organizational forms on their environment or the nature of their work and emphasize the concept of a *fit* between an organizational mode and the market environment, strategy, technology, nature of work, or exchange conditions. Changes in either of these determinants would cause adaptation processes of firms. Those environments where changes are surrounded with significant uncertainties may require different organizational adaptation processes as opposed to environments that are relatively stable and foreseeable (Burns and Stalker, 1961). Hence, uncertainty is a major determinant of organizational adaptation processes. In the following, the thoughts of two scholars, including contingency theory and institutional economics, are briefly introduced, which particularly investigated how organizational structures are designed to enhance the firm's adaptability in *uncertain environments.* These provide the conceptual fundament for the subsequent theoretical examinations in this thesis.

2.1.1 Contingency Approaches

In answer to population ecologists, who emphasized the negative consequences of organizational change and the power of natural selection processes (Hannan and Freeman, 1984), proponents of the contingency theory of organization generally presumed the existence