Organizational Capital Budgeting Model

by

Hyoung-Goo Kang

Department of Business Administration
Duke University

Date:_______________________
Approved:

___________________________
Richard M. Burton, Co-Chair

___________________________
William W. Damon

___________________________
Will Mitchell

___________________________
S. Vish Viswanathan, Co-Chair

Dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of Business Administration in the Graduate School of Duke University

2009
ABSTRACT

Organizational Capital Budgeting Model

by

Hyoung-Goo Kang

Department of Business Administration
Duke University

Date:_______________________
Approved:

___________________________
Richard M. Burton, Co-Chair

___________________________
William W. Damon

___________________________
Will Mitchell

___________________________
S. Vish Viswanathan, Co-Chair

Dissertation submitted in partial fulfillment of
the requirements for the degree of Doctor
of Philosophy in the Department of
Business Administration in the Graduate School
of Duke University

2009
Copyright by
Hyoung-Goo Kang
2009
Abstract

Organizational Capital Budgeting Model (OCBM) is a general theory of capital budgeting that incorporates traditional capital budgeting theories and the consideration about firm’s information/organization structure. The traditional financial capital budgeting model is a special case of OCBM. Therefore, OCBM not only broadens the traditional model, but also explains the heterogeneous behaviors of firms using quasi/non-financial version of capital budgeting. I demonstrate the validity of OCBM with multiple research methods. The field studies about Asian conglomerates are carefully constructed. The conglomerates are important dataset to study organizational decision making because of their size, scope, controversial behaviors and global presence.

Key words: Capital budgeting, controversy, internal capital market, organization, uncertainty
Dedication

To my family and sincere friends.
Contents

Abstract .........................................................................................................................................iv

List of Tables ..................................................................................................................................... viii

List of Figures .................................................................................................................................... x

Acknowledgements .........................................................................................................................xi

1. Introduction ......................................................................................................................................1

2. Literature ........................................................................................................................................8

   2.1 Value space and social factors ...................................................................................................9

   2.2 Social factors, capital budgeting and the behavioral theory of the firm .........................20

   2.3 Standard capital budgeting model (SCBM): Conceptualization and critique ........29

   2.4 Bower Model .........................................................................................................................34

3. Formalization ..................................................................................................................................37

4. Empirical Designs .........................................................................................................................56

5. Case Study Results ........................................................................................................................66

6. Case Discussions ............................................................................................................................77

7. Conclusion ......................................................................................................................................91

APPENDIX 1: Selected Cases ........................................................................................................100

   High uncertainty/ high controversy ...............................................................................................100

   Low uncertainty/ high controversy ................................................................................................120

   High uncertainty/ Low controversy ..............................................................................................137

   Low uncertainty/ low controversy ..................................................................................................156
APPENDIX 2: Open-ended interview items ................................................................. 170
APPENDIX 3: Methodology and Flow ........................................................................ 180
References .................................................................................................................. 187
Biography .................................................................................................................... 193
List of Tables

Table 1: Value Space in Various Theories ................................................................. 19
Table 2: Net Accuracy and Valuation ..................................................................... 40
Table 3: Accuracy and Value Tradeoff .................................................................. 42
Table 4: Social Factors and Valuation .................................................................. 46
Table 5: CSR and Valuation .................................................................................. 48
Table 6: Information and Valuation ...................................................................... 49
Table 7: Procedural Justice and Valuation ............................................................... 50
Table 8: Target Business Groups .......................................................................... 57
Table 9: Case Subjects .......................................................................................... 59
Table 10: Independent Variables .......................................................................... 63
Table 11: Empirical Designs .................................................................................. 64
Table 12: Results from Design 1 .......................................................................... 66
Table 13: Descriptions from Design 1 .................................................................. 67
Table 14: Results from Design 2 .......................................................................... 68
Table 15: Bower Model and HH1 .......................................................................... 85
Table 16: Conceptualizing Results ....................................................................... 89
Table 17: HH1 and OCBM ..................................................................................... 119
Table 18: LH1 and Cost of Capital ........................................................................ 128
Table 19: Cost Model of LH1 ................................................................................ 130
Table 20: LH1 and OCBM ..................................................................................... 136
Table 21: HL1 and OCBM ................................................................. 147
Table 22: HL2 and OCBM ................................................................. 155
Table 23: Part of LL1 Investment Guideline .................................... 163
Table 24: LL1 and OCBM ................................................................. 165
Table 25: Part of LL2 Investment Guideline .................................... 167
Table 26: LL2 and OCBM ................................................................. 169
Table 27: Data sources ................................................................. 179
List of Figures

Figure 1: Valuation Template upon OCBM ................................................................. 96
Figure 2: Technological Trends and Opportunities .................................................... 122
Figure 3: Methods and Flow ....................................................................................... 186
Acknowledgements

1. Introduction

Capital budgeting practices determine the competitive advantage of countries and firms (Baldwin & Clark, 1992, 1994; Porter, 1992). Good investment practices help strategic planning, financial planning, and the creation of a common language (Segelrod, 1998). One important higher-order capability of a firm is to develop and deploy capital-budgeting processes (Maritan, 2001).

A behavioral theory of the firm (BTF) (Cyert & March, 1963) characterizes a firm as full of controversies among subcoalitions while the firm attempts to avoid uncertainty, solve problems and learn through routines. Bower (1970) describes capital budgeting process as the organizational process under bounded rationality, qualitative uncertainty and the controversy among constituents.

This dissertation uses the framework of BTF and Bower to investigate firms’ capital budgeting practices. My research question is why capital budgeting practices are heterogeneous. If firms determine investment with Net Present Value (NPV) or other standard techniques of existing literature, the observed practices should be homogeneous. In order to solve this empirical puzzle, I suggest a general capital budgeting model that considers organizational, social, and financial factors. This model nests the standard models as special cases.
I investigate the situation in which agents rationally choose valuation methods under the influence of social factors. This setting contrasts the more conventional view that NPV is the optimal valuation tool and should be used during capital-budgeting process. I argue that valuation methods are the cognitive frames and forms through which actors perceive objects and things such as investment opportunities. According to Einstein (1930), “The human mind has first to construct frames, independently, before we can find them in objects” (Frankfurter Allgemeine Zeitung on November 9, 1930, for the commemoration of the 300th anniversary of Kepler’s death). NPV is only one of the forms and frames, and its optimality is not guaranteed. This joint consideration of frame and objects requires us to consider valuation and capital-budgeting behaviors in a substantially novel manner, in order to understand them from a general perspective.

The standard capital-investment and capital budgeting model (NPV and its variations; SCBM hereafter) are effective in examining observed practices in special cases. SCBM offers very specific theories about the best practice of investment-decision making (e.g. Brealey & Myers 2002, Brealey, Myers & Allen, 2005). For instance, the titles of Chapters 5 and 6 of Brealey et al. (2005) are, respectively, "Why Net Present Value Leads to Better Investment Decisions than Other Criteria" and "Making Investment Decisions with the Net Present Value Rule."
Nevertheless, while SCBM presumes NPV and its variations as normative and common practices, the real capital allocation is much richer, heterogeneous and complicated. In general, the decision-making processes as important as capital allocation are quite subtle as abundant literature about organizational decision-making suggests (e.g. Burton, DeSantics & Obel 2006; Cyert & March, 1963). Bower’s (1970) book, which finds that standard models are ‘not useful,’ is a good example of the organizational process of resource allocation.


To illustrate, Ackerman (1970) describes heterogeneous investment process with heterogeneous firm characteristics. Seglelod (1998) reports that the investment manual and practices vary widely -- from group to group, in time-series (e.g. more focus on strategic measures during ‘80), in classification (e.g. strategic vs. operational investments; NPV for expansion vs. replacement for PBP), in business cycle (boom vs. 

3
recession), and in industry (service vs. manufacturing sector). Maritan (2001) investigates the variation of capital-budgeting process within and across firms and finds that capital budgeting varies subject to the interaction among procedural rationality, politicality and uncertainty, which are in line with bounded rationality, controversialism and uncertainty in Bower (1970).

This paper constructs and tests a broader theory about capital budgeting in order to explain the heterogeneous resource allocation patterns in internal capital market. In order to do so, I introduce a new concept: Organizational Capital Budgeting Model (OCBM). OCBM is a general theory of capital budgeting that admits the traditional financial capital budgeting model as a special theory and that understands capital budgeting as an organizational phenomenon. Therefore, OCBM intends both to broaden the traditional model and to explain the behaviors of firms using quasi/non-financial version of capital budgeting. This contrasts with Bower (1970) who neither attempts to build a general theory nor specialized financial techniques, but who conceptualizes organizational processes in order to describe and prescribe capital-budgeting practices better.

The unit of analysis to test OCBM is the method that firms use. I will demonstrate the validity of OCBM with qualitative studies. I will construct an ethnography of Asian conglomerates. The conglomerates are important dataset for the
study of organizational decision-making because of their size, scope, controversial behavior, and global presence.

To summarize, traditional capital-budgeting models do not have the theoretical space to incorporate this important intuition and fail to explain the observed practices. Traditional approaches to capital budgeting emphasize financial factors, with only imperfect explanatory power, but organizational theories of the firm suggest several behavioral factors that may influence the capital budgeting models that firms employ. This paper will construct a general model that combines the intuition of traditional approaches and organizational theories in order to address the important issues in internal capital market and capital budgeting and to increase the explanatory power on the heterogeneous capital-budgeting behaviors. I validate the model with qualitative studies.

Capital budgeting is an important subject. Capital budgeting takes place in internal capital market. I study internal capital market and capital budgeting for several reasons. First, the valuation in the internal and external market converges in a perfect capital market. Thus, the theory of internal capital and capital budgeting can have large implications for the external capital market in which market valuation leads the flows of capital. Second, the internal capital market is the most important source of investment
(e.g. Pecking-Order Hypothesis; Myers & Majluf, 1984). Third, internal capital market may show the important issues in various fields, such as economics, finance, strategy, and organization theory.

Let us illustrate the importance with firm theory. In an economy, there exists a market, firm and firm boundary as we put aside social network theories and follow the logic of transaction cost economics. Firms are organized transactions (Coase, 1937). The factors of production are land, capital, labor and knowledge. Classifying with the factors of production, I define four organizational arrangements for internal transaction: internal capital market (ICM), internal labor market (ILM), internal knowledge and technology market (IKM). I relate those internal transactions with firm/strategy theories as follows: ICM with property right view (Grossman & Hart, 1986; Hart & Moore, 1990; Gertner, Sharfstein & Stein, 1994), ILM with contractual view (e.g. Alchian & Demsetz, 1972) and IKM with knowledge-based view (Kogut & Zander, 1992) and dynamic capabilities (Teece et al., 1997).

To focus on ICM, ICM is loaded with restrictions and imperfections compared to the external capital market (Triantis, 2003). Thus, the prices of internal capital and of the objects, which receive internal capital, may not exist (Burton & Damon, 1974). If prices are present, teams can define transfer prices and the terms of trade internally. If prices are absent, internal capital allocation may require fiat, called capital budgeting activities.
In addition, since prices are absent, firms need to discover prices or broker prices between transaction parties with valuation in the presence of uncertainty or controversy. Thus, capital budgeting accompanies valuation. It is natural that many people envision valuations together when they refer capital budgeting.

To trace, capital budgeting (and valuation) are important to understand ICM, ICM is important to understand the firm, and the firm is important to understand the economy. Therefore capital budgeting is central to many fields. In addition, since internal allocation also occurs in ILM and IKM, the budgeting logic is similar to that in ICM can exist both in ILM and in IKM. Contractual and knowledge-based view deal only partially with the problem. Hence, we can produce knowledge spill-over to the research about ILM and IKM by comprehending capital budgeting. For instance, we can expect an abstract allocation model, covering capital, labor and knowledge budgeting.
2. Literature

Two central concepts arise from our empirical puzzle of heterogeneous capital budgeting and valuation practices. The first concept is value space, the two-dimensional space of valuation strategies and investment opportunities. The heterogeneous valuation practices imply that valuation is the choice variable of rational decision-makers because heterogeneity cannot be random events. Since the choice of valuation frames influences the assessment of investment opportunities, valuation is the process of constructing the meaning of investment opportunities. In addition, since a firm is the bundle of investment opportunities to grow, the choice in value space means that the choice of frames constructs firm values.

The second concept is social factors, in particular controversy and Knightian uncertainty. The choice in value space does not imply the heterogeneous solution. There should be firm-specific factors to generate heterogeneous solution in value space. Natural firm-specific factors are the firm-specific social and organizational factors. Among the social factors, I focus on controversy and Knightian uncertainty, relying on Cyert and March (1963) and Bower (1970).

This section discusses background literature based on the two central concepts: value space and social factors. First, I discuss how the ideas similar to value space concept are prevalent in the literature. Second, I show the importance of social factors

2.1 Value space and social factors

The notion of value space touches on one of the fundamental issues about knowledge. Valuation method and investment opportunities are frames and objects, respectively, in epistemology. I will use the terms frame and object, in this section in order to stress the link between value space and epistemology. Epistemology is a branch of philosophy that studies the nature of knowledge, truth and belief. Value space idea implies that actors perceive objects with frames. The frames can be a deliberate choice of the actors or be enforced. I take an intermediate view. There is a boundary of frames, which I express as the set of valuation strategies. The set is exogenously given, but actors choose a subset of frames inside the given set. If the set is singleton, there is no free will in the choice. If the set includes all the possible frames, there exists complete freedom. The value space is the space spanned with frames and objects. Value space is the central concept to build a general model of capital budgeting and to overcome standard financial models.

Value space presumes a strong version of constructive epistemology since it can allow environmental variables to influence the choice of frames in order to perceive
reality. Berger and Luckmann (1966) are well-known proponents of social constructionist argument. In The Social Construction of Reality, they argue that social relations construct knowledge. Social interactions result in institutionalization, the process which embeds meaning in society. Since people live in a society covered with layers of institutions, they perceive socially constructed reality.

The value space idea is slightly different from the idea of Berger and Luckmann. Since value space allows people to select frames, it includes the neoclassical economists’ view of choices. It is possible that people choose the frames of perceiving object in order to optimize their goals such as preference. Value space idea incorporates the views of both neoclassical economists and the sociologists like Berger and Luckmann. If the institutional restriction on the set of frames is strong, value space idea converges with the sociologists’ views because knowledge is socially constructed. If the restriction is weak enough, it becomes a neoclassical view. Of course, it can be arguable to distinguish the sociologists’ and economists’ perspectives only with the restriction on the set of frames. For instance, standard financial economics argues that NPV is the optimal frame for valuation. It regards other methods as suboptimal. In that sense, the standard view imposes strong restriction on the set of frames. However, since the choice of NPV does not involve explicitly any social influences, NPV is not sociological. Nevertheless, value
space is a sufficiently general idea to incorporate several theories and use them to build a model.

To summarize, value space is an important concept in valuation. It stresses that firms make choice in two-dimensional space of valuation strategies and investment opportunities. The key idea of value space is the separation of objects and frames, in which actors observe objects through the choice of frames. Since objects and frames can be co-determined under social influences, value space rejects the assumption of the dichotomy between objects and frames. In this sense, the intuition of value space becomes similar to The Social Construction of Reality (Berger & Luckmann, 1966) as social factors influence the choice of frames. Standard finance approach is subject to the dichotomy because NPV is optimal regardless of the kinds of investment opportunities.

Concepts similar to value space appear in many theories of strategy and organization. For instance, several theories distinguish frame and object. The pair of endogenous and exogenous variables is one example. The selection of endogenous variables may vary with the exogenous variables. A range of outcomes occurs in response to how selected endogenous and exogenous variables interact. More generally, there are internal and external variables. Internal variables are inside the boundary of
organizations or agents, while external variables are from outside. The interaction between internal and external variables produces outputs.

Since value space idea occurs in many theories, value space is a natural benchmark from which I can discuss the commonalities and differences between Organizational Capital Budgeting Model (OCBM) and other theories. Similarly, since value space is a central concept of OCBM, I can determine how OCBM inherits the intuition of various theories and how OCBM can contribute to literature. In the following literature review, I discuss several theories with the value space framework in order to relate OCBM to the existing literature.

In Standard Capital Budgeting Models (SCBM), we can conceptually distinguish frames from objects. Nonetheless, since NPV is the optimal solution, the distinction is irrelevant. The value space becomes one dimension in which the frame axis degenerates into a singleton (i.e. NPV). When NPV meets an investment opportunity, valuation occurs. Since any deviation from NPV is suboptimal, SCBM imposes NPV on all firms to evaluate investment opportunities in all situations. Thus, there is a clear dichotomy between frames and objects such that the choice of frame is independent of objects. Since OCBM regards such a dichotomy as a special case, it is intuitive why SCBM is a special case of OCBM.
In behavioral decision theories, choice strategies are frames, and objects are choice sets. The concept of constructive preference is particularly relevant here. Bettman, Luce and Payne (1998) assert that preferences are constructed at valuation and that the construction process is subject to both human information processing system and task properties (Bettman, Luce & Payne, 1998; Payne, Bettman & Johnson 1992; Payne, Bettman & Schkade, 1999; Slovic 1995). The process of construction involves the selection of choice strategies. Choice strategies include WADD (weighted adding), LEX (lexicographic), SAT (satisficing), EBA (elimination-by-aspects), EQW (equal weight), MCD (majority of confirming dimensions), FRQ (frequency of good and/or bad features), CCM (componential context model) and RC (random choice). Without the choice of choice strategies, the preference of an object cannot be determined ex-ante. Preference arises only at the moment of valuation. Thus, the behavior of selecting choice strategies is termed as constructive preference.

In the resource-based view (RBV, Wernerfelt 1995 for review), objects are resources. Since strategies mean the deployment of resources in RBV, we can regard strategies as frames. Thus, boundedly rational firms make choices in strategy-resource space in order to maximize performance. The correct choice of strategy is subject to the type of resource and the structural variables of firm, such as ‘structure determines strategy (Chandler, 1962).
RBV has important implications for OCBM. First, I can regard investment opportunities as the valuable resources upon which firms can create sustainable competitive advantage. Second, and more importantly, we can view the choice of valuation methods as the deliberate strategic choice subject to structural variables. Well-chosen strategies may include more than computing NPV of an investment opportunity. The apparent deviation from NPV may not be a mistake, but the strategic action to balance various strategic goals with the appropriate computation of values. The comparison of RBV and OCBM also has substantial managerial implications. Managers should understand a valuation choice as a strategic choice rather than as computation.

Dynamic capabilities framework and RBV have similar implications for OCBM. In dynamic capabilities framework, frames are processes, and objects are rapid technological changes. The processes are both managerial and organizational, such as “the way things are done in the firm, or what might be referred to as its routines, or patterns of current practice and learning” (Teece, Pisano & Shuen 1997). The ability to deploy processes under rapid technological changes determines the competitive advantage of firms. Dynamic capabilities mean such deployment ability. In an environment of rapid technological changes, investment opportunities may change quickly. OCBM implies that the right choice of valuation strategies in response to
dynamic investment opportunities generate superior performance. The ability to conduct proper valuation is a considerable dynamic capability (Maritan, 2001).

In behavioral theory of firm (BTF) by Cyert and March (1963), the frame is routine, and the object is the problem. Under bounded rationality, firms rely on routines to solve problems. It is hard to change routines. They change only incrementally to resolve problems. Besides value space, BTF and OCBM share important intuition such as controversy and Knightian uncertainty. In addition, both regard organization as a coalitions. I will discuss this in detail.

Evolutionary economics (Nelson & Winter, 1982) is an important descendant of BTF. Thus, as with BTF, the frame is a routine, and the object is a problem. Evolutionary economists assume that routines are difficult to change. Nelson and Winter compare routines to genes in biological evolutionary theory. Routine functions as memory, truce, target- (control, replication and imitation), skills and optimization. The routine, as a frame, addresses controversy and Knightian uncertainty.

The literature on organizational learning (e.g. Levitt & March, 1988) has been influenced by BTF and evolutionary economics. Like BTF and evolutionary economics, frame is routine, and object is information. Organizational learning is the routinization process in which organizations match routines with information. Routines bear organizational knowledge. Since investment opportunities appear as information to
firms, valuation activities can be regarded as learning the investment opportunities by matching valuation routines and investment opportunities. Such learning can mean more than computing values. As organizational learning argues, learning involves the communication and storing of information, so that the organization can later retrieve and use that knowledge. In addition, building absorptive capacity (Cohen & Levinthal, 1990) is an important purpose of learning. Such consideration for learning influences what valuation strategy a firm should choose, and this is what OCBM investigates.

In organizational ecology (Hannan & Freeman 1977), a frame is organizational forms and process, and object is environment. It determines the vital rates of the population of organizations how fit an organizational form is its environment. The vital rate is the rate of population change due to founding and mortality. Organizational forms determine positions such as generalists or specialists. According to value space logic, valuation strategies are organizational forms and processes, and investment opportunities belongs to the environment.

Hsu and Hannan (2005) propose the identity-based conceptualization of organizational form, which sees organizational forms as types of identities. Frame is genre and identity while the object is environment. Organizational identities are the sets of social codes and rules that audience members hold. It is similar to artistic genres. Valuation patterns can be an important element in determining the identity of
organization for several reasons. First, investment occurs in all for-profit organizations. Second, investment is important enough to determine the vital rates of organizations. Third, valuation determines the success of the investment. Thus, OCBM and organizational ecology can be closely related.

In neoinstitutional theory (Scott, 2001), frame is institution and institutional change, and object is institutional environment. An institution is legitimate or illegitimate depending on how the institution rests in the institutional environment. The rise of an institution or institutional change occurs through the structuration process. Structuration is the interaction of bottom-up and top-down processes. A top-down process denotes how higher-level structures outline the manner in which lower-level actors operate. A bottom-up process discusses how lower-level actors form the context in which they operate.

Burton et al. (2006) and related multicontingency theories the performance of an organization results from the fit and misfit relations among various variables. Burton et al. proposes 14 variables of organizational design components. They argue that the correct configuration of the variables should be holistic, so that an organization can achieve fit only through the simultaneous consideration of the 14 variables. With the exception of environment, I believe that the other 13 variables are controllable, at least in long term. Thus, I can regard the environment as object and the other 13 variables as the
frame for an organization to address the environment. In addition, OCBM discusses configuration. The optimality of capital budgeting is achievable through the correct configuration of investment opportunities and valuation methods.

The next table summarizes the comparison between OCBM and other theories in the strategy and organization literature. It discusses the differences and similarities between OCBM and other theories with the concepts of value space.
Table 1: Value Space in Various Theories

<table>
<thead>
<tr>
<th>Value space in theories</th>
<th>Commonalities in value space</th>
<th>Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCBM</td>
<td>Valuation strategies</td>
<td>Valuation/ Goal</td>
</tr>
<tr>
<td></td>
<td>Valuation opportunities</td>
<td>Choice</td>
</tr>
<tr>
<td>Financial valuation models</td>
<td>NPV types</td>
<td>Valuation</td>
</tr>
<tr>
<td></td>
<td>Investment opportunities</td>
<td>Not efficient</td>
</tr>
<tr>
<td>Behavioral decision theories</td>
<td>Choice strategies</td>
<td>Choice</td>
</tr>
<tr>
<td>Resource-based view</td>
<td>Deployment</td>
<td>Preference</td>
</tr>
<tr>
<td>Dynamic capabilities</td>
<td>Process</td>
<td>Competitive advantage</td>
</tr>
<tr>
<td>Transaction cost economics</td>
<td>Transaction modes</td>
<td>Efficiency</td>
</tr>
<tr>
<td>Behavioral theory of the firm</td>
<td>Routines/ procedures</td>
<td>Performance</td>
</tr>
<tr>
<td>Evolutionary economics</td>
<td>Routines</td>
<td>Performance</td>
</tr>
<tr>
<td>Organizational learning</td>
<td>Routines</td>
<td>Hard</td>
</tr>
<tr>
<td>Organizational ecology (OE)</td>
<td>Organizational forms</td>
<td>Learning</td>
</tr>
<tr>
<td></td>
<td>Environment</td>
<td>Routinize</td>
</tr>
<tr>
<td>OE: Hsu &amp; Hannan 2005</td>
<td>Identities/ Genre</td>
<td>Vital rates</td>
</tr>
<tr>
<td></td>
<td>Environment</td>
<td>No. New species.</td>
</tr>
<tr>
<td>Neoinstitutional theory</td>
<td>Institution (changes)</td>
<td>Legitimacy</td>
</tr>
<tr>
<td></td>
<td>Institutional environment</td>
<td>Structuration</td>
</tr>
<tr>
<td>Multicontingency: Burton et al., 2006</td>
<td>Controllable variables</td>
<td>Fit/ misfit</td>
</tr>
<tr>
<td></td>
<td>Environment</td>
<td>Organizational design</td>
</tr>
<tr>
<td>Marxism</td>
<td>Superstructure (Ueberbau)</td>
<td>Social order</td>
</tr>
<tr>
<td></td>
<td>Substructure (Unterbau)</td>
<td>Upheaval</td>
</tr>
</tbody>
</table>
2.2 Social factors, capital budgeting and the behavioral theory of the firm

A behavioral theory of the firm (BTF) has long established the firm as the coalitions in social and organizational contexts. Organizational factors change the balance of interests among subcoalitions and consequently affect the behaviors of firms. However, no research has satisfactorily studied capital budgeting problems from a BTF approach. Capital-budgeting models can be expressed as the function of the variables in BTF. I examine specific mechanisms to relate BTF with capital budgeting problems. I investigate how capital-budgeting behaviors vary and are characterized by variations in BTF concepts. Two concepts in BTF stand out in capital budgeting: controversy and Knightian uncertainty. OCBM introduces the concepts to model capital budgeting.

Controversy

Controversy conceptualizes the interaction among subcoalitions in an organization and society such as controversy in Hobbes (1651), Coase (1946) and Rawles (1971), conflict in Cyert and March (1963), controversialism in Bower (1970). Subcoalitions differ in networks, endowments, values and incentives. The differences result in controversies such as opportunism, information impactness, principal-agency relation, conflict of interests, communication, information sharing, learning, and political
issues. BTF notes the importance of controversy. First, it views the organization as the coalition of individuals and subcoalitions with complex interests. Equity holders, managers and employees are internal to organizations. Banks, local or central government and consumers are partly external. The controversy among coalitions generates bargaining and negotiations to make decisions. The controversy in capital budgeting is the natural extension of such a coalition view of organizations. Second, BTF proposes that the coalitions generate the organizational goals through the resolution of controversy. A specific organizational goal is emergent. Thus, a goal is the function of underlying social variables as controversy. In capital budgeting, it is required to incorporate controversy in a goal function of an organization in order to build a model of how an organization chooses capital-budgeting methods.

Indeed capital budgeting is loaded with controversies among subcoalitions. For instance, decision makers need to consider controversy not only during the valuation, but also afterwards. The front-end cost of valuation is borne by analysts and strategists, but the back-end cost is by execution teams. The subcoalitions at the front-end can be rewarded upon the development and initiation of projects. Those at the back-end can be rewarded upon the implementation speed and intermediate performance of projects. Thus, we can expect the conflict between those subcoalitions about the level of accuracy in valuation. The front-end has the incentive to shift the burden of accuracy and other
valuation issues to the back-end. In addition, if a project fails, those at front- and back-ends may argue over whether the plan or the implementation was wrong. Expecting such argument, the subcoalitions at both ends will debate projects. Such methodological and political debates affect the selection of valuation routines.

A similar internal debate exists even among the subcoalitions of front-end about the trade-off between rejecting valuable projects (Type-I error) and accepting wasteful projects (Type-II errors). Whereas subcoalitions for Type-I error tend to put high hurdles on plans, those for Type-II errors prefer generous valuation. They will argue over the qualitative aspects of projects. In addition, if subcoalitions have different interests, they would argue not only about contents, but also about the accuracy of valuation. Risk managers and empire builders may constitute the Pro-Type-I and -II sides, respectively. This kind of team production problem is one of the most important considerations of an organization (Alchian & Demsetz, 1972).

Influenced by BTF, many papers consider controversy important. Existing routines need to equilibrate intra-organizational conflict (Nelson & Winter, 1982). Top executives review projects on the basis of potential controversialism (Bower, 1970, p65). Controversy can present diversity, creativity and novelty of opinion. Bartlett and Goshal (1993) find that ABB deliberately creates internal controversy to introduce discipline and refinement in decision-making. Capron and Mitchell (2008) find that the conflict in
organizations can improve effectiveness in creating capabilities, and the likelihood of survival. Laux (2008) proposes that influencing activities provide the incentive to acquire and reveal costly information.

Nevertheless, even though controversy is helpful in information sharing, it needs to be resolved in decision-making and implementation. Eisenhardt (1989) argues that the resolution of controversy can enhance performance, but controversy per se may not. In sum, controversy is desirable in some cases, but firms intend to minimize controversy at the moment of decision-making. Maritan (2001) finds that the desired level of politicality in capital budgeting is subject to procedural rationality and uncertainty.

Arrow’s possibility theorem (Arrow, 1951) rigorously proves that it is very difficult to resolve the controversy among subcoalitions. The theorem proves that no social choice rule ($\Xi$) satisfies simultaneously following four conditions: (1) $\Xi$ satisfies asymmetric and negatively transitive ordering for every array of individual preference, (2) if every individual prefer $x$ over $y$, $\Xi(x)$ should be greater than $\Xi(y)$, (3) the independence of irrelevant alternatives (IRA) holds and (4) there is no dictator such that an individual's preference is social choice rule. We can regard valuation strategies as social choice rules over investment opportunities. Thus, the difference among subcoalitions is not easily resolved in valuation process because the resolution of controversy is not possible without breaking one of the four conditions of Arrow. In the
problem of capital budgeting, it is required to consider the role of situational and social factors or the process of building consensus in order to relax the conditions (3) and (4) in Arrow theorem.

Controversy is an important variable in other literature. Coase (1946) criticizes the Hotelling-Learner solution, revealing the implicit cost of controversy. Hobbes (1651) and Rawls (1971) discuss controversy from the perspective of social contract theory. Similar concepts are dispute and struggle, which have been important subjects of numerous people such as Aristotle (Politics; ethical treaties), Hegel (master-slave dialectic) and those influenced by them. In economics, organizational process resolves the alignments of interests between principals and agents (Holmstrom & Tirole, 1989; Jensen & Meckling, 1976), opportunism, information impactness and information asymmetry (Akerlof, 1970; Williamson, 1975).

(Knightian) Uncertainty

Knightian uncertainty (Keynes, 1921; Knight, 1921) is immeasurable and qualitative. It is different from risk, whose distribution can be described. BTF argues that firms avoid uncertainty. Schmeidler (1989) and Gilboa and Schmeidler (1989) discuss how a firm avoids Knightian uncertainty under reasonable conditions even under risk
neutrality. Knightian theory views firms as the consequence of decision-making under Knightian uncertainty (Boudreaux & Holcombe, 1989).

BTF considers problemistic search to address the uncertainty avoidance tendency of organizations. In addition, BTF argues that the order of search under uncertainty can determine organizational decisions substantially. Thus, the theory of choice and search merges. It implies that firms do not simply apply standard valuation models to exogenous investment opportunities, but construct the investment opportunities through search process. In short, since choice and search merge, valuating and constructing investment opportunities become inseparable. Similarly, research and learning become important elements of valuation.

BTF defines organizational learning in terms of adaptation. Organization-learning theory is the direct extension of BTF (Argote & Greve, 2007). Social factors are important in organizational learning. March (1991) suggests two important factors in organizational learning. The first is the mutual learning of an organization and its participants. The second is the competition for primacy. The first resolves the uncertainty, and the second presents the controversy. March argues that knowledge acquired from the learning exists in the procedures, norms, rules and forms of an organization and that the participants are socialized to organizational beliefs. He also argues that individual belief changes in association with organizational codes through
socialization. The speed of the socialization process provides a balance between socializer and the socialized. Such an argument suggests the mechanism of how learning transforms uncertainties into socially constructed beliefs about investment opportunities. This view suggests the relations among the central concepts in capital budgeting such as controversy, uncertainty and value space.

Bounded rationality and net accuracy

Bounded rationality is an important concept in BTF, influenced by Simon (1957). Bounded rationality increases the significance of controversy and uncertainty. Bounded rationality takes into account the cost of decision-making to achieve a certain level of accuracy. Accuracy is an important consideration in capital budgeting. For instance, a project could be selected if \( \text{NPV} > 0 \) or \( \text{IRR} > \text{cost of capital} \). NPV, IRR or cost of capital involves modeling, which is subject to errors. If a firm improves the accuracy of NPV or IRR models, it can reduce the probability of selecting value-destroying project (Type II error) and of discarding value-creating projects (Type I error). The back-end cost of inaccurate valuation also exists. Inaccurate valuation imposes the costs in implementation stages. Valuation is an important part of business plan, upon which firms decide schedules, project team, procurement and strategy. If a firm finds errors in
valuation during implementation stage, it may need to update the implementation tasks in accordance, which increases implementation costs.

While accurate valuation decreases both front-end and back-end costs as illustrated, it requires organizational resources. In order to perform accurate valuation, a firm may have to use a larger number of experienced analysts and take more time to collect information and create sophisticated models. The analysts and their time incur opportunity costs. Sophisticated models require a firm to spend more time to understand and implement the plan.

Therefore, a firm needs to balance the benefit and costs of accurate valuation, which results in the bounded rationality in valuations (Simon, 1955). The use of heuristics or routines of BTF can be a solution to bounded rationality. BTF has been the starting point of applying bounded rationality in organization analyses (Argote & Greve, 2007). BTF argues that many organizations are limited to two cases: good enough and not good enough. The good enough decision is a satisficing solution to achieve aspiration level while balancing the cost and benefits involved in the decision-making process. Satisficing becomes more sensible as the relatedness among decisions increases (March & Simon, 1958; Nelson & Winter, 1982; Rivkin, 2000). Bower proposes that capital budgeting involves “the intellectual activities of perception, analysis and choice
which are often subsumed under the rubric of decision making” (1970, p.7 and p.50).

The next quote by Bower is informative.

In a fashion best described by Herbert Simon, in Administrative Behavior (50), managers rely on the formally defined system of organization, measures, and rewards to help them develop decision rules. These decision rules provide routines that permit a manager to rationalize the demands of his job. (1970, p.50)

To summarize, BTF suggests several interesting perspectives on the research on capital budgeting. Methodologically, BTF shows the benefit of qualitative studies. Conceptually, BTF assumes bounded rationality, problemistic search, coalitions, uncertainty avoidance, standard operating procedures, and slack search. Those concepts are important to capital budgeting. Bounded rationality determines net accuracy in decision-making, coalitions generate controversy, and uncertainty avoidance concerns uncertainty in investment decision.

I use both methodological and conceptual elements of BTF to construct new capital budgeting model. I conduct ethnographic studies of Asian conglomerates. I stress bounded rationality, controversy among subcoalitions and the organizational responses to Knightian uncertainty to build a new model of capital budgeting.
2.3 Standard capital budgeting model (SCBM): Conceptualization and critique

In the framework of Standard Capital Budgeting Models (SCBM), the attractiveness of a project is Value: \( \text{Value} = \text{E(Cash)} - \text{Rd} \times \text{Inv} \), using forward notation. Rd denotes opportunity cost of capital. Inv is the size of investment. Since risky projects are less desirable, we should reduce \( \text{E(Cash)} \), increase Rd, increase Inv or the combination of them as risk increases. The conceptualization of SCBM, more specifically, is as follows.

**Decrease E(cash):** We can decrease the expected future cash terms by changing probability distribution of future cash stream. This approach is similar to risk-neutral probability measure approach, which is particularly useful in derivative pricing and real option (Black & Scholes, 1973; Dixit & Pindyck, 1996).

**Increase Rd:** We can adjust the required rate of return by modeling it as the increasing function of risk. Weighted average cost of capital (WACC) is the stylized way to incorporate risks. WACC is the linear combination of the opportunity costs of equity and debt. The ratio of the costs is a function of capital structure and tax rate. The costs of equity and debts are modeled with single/multi-factor models. CAPM is an example. This is the method of textbook used widely in business schools (e.g. Brealey, Myers & Allen, 2007).
**Increase Inv**: Alternative way is to transform the amount of capital invested. Inv is modified by adding capital charge to the true amount of investment in response to risk. The higher the risk in an investment, the higher the capital charges in the investment. This method is particularly popular among financial institutions to meet the capital requirement stipulated in regulations. Basel II is the industry standard. Basel II agreement requires capital to be over 8% of risk-weighted assets plus 12.5% x (capital charges) for market and operation risk. Risk-weighted asset is amount of (exposure) x (risk weight). Thus, as the risk of asset increases, the capital requirement increases. The capital charge denotes the difference between capital requirement and current capital. For details, see Jorion (1997).

This characterization conceptualizes standard capital budgeting models (SCBM). SCBM has some notable properties. First, decision-making is straightforward. Given investment opportunities, SCBM is applied to compute the value. Second, the dichotomy between investment opportunity and decision-making process is assumed. The functional form of SCBM remains the same regardless of the investment opportunities or the contexts in which the valuation occurs. The first and second are related. The
decision-making is trivial because investment opportunities are exogenously given, and SCBM is the formula for the investment regardless of social influences.


Second, the argument for SCBM has a narrow view of the interaction between frame (valuation) and object (investment opportunity). SCBM disregards the intuition of social constructionists and lacks the theoretical space to incorporate organizational and social factors. Using epistemological terms, SCBM is one type of frame to observe objects. In capital budgeting, objects are investment opportunities. The meaning of objects is subject to what types of frame are selected. The selection of frames can be
subject to social and organizational contexts. Thus, the meaning of investment opportunity, (e.g. value and attractiveness), can be socially constructed. SCBM argues that the selection of frame is imposed or exogenous in investment decision-making because of its supposed optimality. In contrast, the social constructionist argument implies that the choice of frame can be endogenous. Indeed, once we make the frames as choice variable, it is easy to disprove the optimality of any particular method.

Among SCBM, NPV is the most influential capital budgeting model. Capital budgeting is the investment behavior in the internal capital market. Even in the external capital market, the variations of NPV are the most influential valuation and pricing models. Many stock analysts, venture capitalists and bank officer use such models as discounted cash flow, discounted earnings, earnings multiple or EVA. The spirits and mathematical formulation of those models are essentially the same as in NPV.

Real option technique is also the part of SCBM. While real option technique involves decision-making over the course of projects, it assumes the dichotomy also. First, Abel, Dixit, Everly and Pindyck (1996) show that one can apply NPV instead of real option technique if a decision maker accounts for future marginal returns to capital at the future optimal levels of the capital stock. Thus, NPV covers real option as a special case. Second, the decision-making process is still trivial and mechanical in that the value of underlying investment opportunities follows some exogenous process, and a decision
maker exercise the real option (i.e. investment) when the underlying value hits some critical values. Nevertheless, real option has the value in designing projects (Bowman, 1963). Some of my case studies demonstrate how firms use valuation tools for constructing projects rather than computing underlying values. The design of projects using real option is a special case of using valuation methods to construct investment opportunities.

Given the influence of SCBM, especially NPV, my critique has large implications for both practice and academia. We may need a novel model for asset pricing in external capital market, capital budgeting in internal capital market, investment in public sectors, strategy making, and performance evaluation.

My purpose is not to overturn SCBM. SCBM works very well in many situations and is good at capturing risk. However, SCBM is silent on how firms deal with social and organizational contexts. OCBM models the social factors and allows the possibility of choosing heterogeneous capital budgeting models. OCBM just makes SCBM a special case.
2.4 Bower Model

Bower (1970) presents the seminal model of resource allocation process in multidivisional firms. The following quote shows how Bower indeed considers bonded rationality, controversy and uncertainty as important factors in capital budgeting.

The processes by which resources are committed in turn involve (1) intellectual activities of perception, analysis, and choice which are often subsumed under the rubric “decision making”; (2) the social process of implementing formulated policies by means of organizational structure, systems of measurement and allocation, and systems for reward and punishment, and finally (3) the dynamic process of revising policy as changes in organizational resources and environment change the context of the original policy problem. (pp.7-8, 1970).

Bower built the model through multiple case studies, which he calls the approach of anthropologists. The Bower model is a descriptive capital budgeting model. It describes the process that business-level managers initiate and define investment requests, middle-level managers integrate the behaviors in corporate and business level, and corporate management designs the structural contexts (rule of the game) to support the projects in line with the strategic direction. This capital budgeting behavior is a socio-political process in the organizational contexts such as controversialism, bounded rationality and uncertainty.

OCBM includes the Bower model as special cases. First, OCBM is applicable to all organizations while Bower model is specialized into multidivisional forms. Second,
OCBM is interested in each step of decision-making and in the entire process. Thus, compared to the Bower model, OCBM is not only a process model but also a normative and optimization model. In OCBM, capital-budgeting process such as Bower model is the serial collection of the smaller decision-making processes through which OCBM applies. Third, OCBM views capital budgeting as the function of social factors. In comparison, the Bower model describes the capital-budgeting behaviors in the context of particular hierarchy such as business-level, middle-level and corporate management. Thus, OCBM predicts that capital budgeting can remain constant in different hierarchy if social factors remain the same. OCBM regards variations in the organizational attributes. Fourth, while Bower rejects standard financial models as useless, OCBM incorporates it as a special case. Bower argues that the multidivisional form of organization arises in order to administer high politicality and uncertainty. Bower’s socio-political process characterizes the capital budgeting processes under those conditions of high controversy and high uncertainty. Since standard financial models govern the situation of low controversy and uncertainty, it is no wonder that Bower regards standard models less useful. OCBM, as a more general model, expresses the budgeting model as the function of controversy and uncertainty. Thus, both Bower and standard models become the special cases of OCBM.
To summarize, Bower’s model has been influential in describing the resource allocation process. The socio-political model addresses the capital-budgeting behavior of multidivisional firms under conditions of high controversy and uncertainty. However, no research has investigated how the Bower model can change as the social factors change. OCBM does not set the attributes of organizations as given. Thus, OCBM can expand the Bower model and understand the special socio-political process of resource allocation in broader organizational contexts.
3. Formalization

This section develops Organizational Capital Budgeting Model (OCBM) with value space and social factors. I hypothesize that a firm conducts following OCBM-optimization when the set of valuation methods (S) and raw investment opportunities (K) are given. OCBM is defined in association.

Definition: OCBM-optimization means,

Maximize: \( G(V, B, C, U, X) \), in which \( B = A - E \)

With respect to \( s \in S \) and \( k \in K \)

Definition: OCBM is the set of \( s \) that solves OCBM-optimization given \( k \).

\( OCBM(k) = \arg\max_{s} OCBM\)-optimization for a given \( k \) and \( s \in S \).

Notations: \( \{V, B, A, E, C, U\} \) are the functions of \( s \) and \( k \). They are the perceived value \( (V) \), net accuracy \( (B) \), accuracy \( (A) \), effort \( (E) \), controversy \( (C) \) and uncertainty \( (U) \). Net accuracy is gross accuracy minus effort to obtain the gross accuracy. \( X \) denotes situation factors and may include \( S \) and \( K \). Let us call \( \{C, U\} \) as social factors. I assume well-defined second order conditions. \( C \) and \( U \) capture internal and external influences in a broader view. \( V = V(s, k) \) is the derived value of a project \( k \) using a valuation.
method s. For instance, V can increase with mean, but decrease with its variance if s is mean-variance optimization. If s is NPV method, V increases with expected cash flow, but decreases with the beta of the cash flow.

Once we presume the choice set as S x K (value space) instead of just K, it is clear that simply maximizing perceived firm value (V) is unrealistic. Otherwise, a firm would choose the most optimistic valuation method for a given k. This situation may hold only in particular contexts such as exaggeration, strategic disclosure or moral hazard. Thus, the choice of valuation methods should be also able to build consensus among subgroup and to assist informed decision-making. To follow the intuition, the OCBM-optimization hypothesizes that organizations conduct capital budgeting in order to accomplish goals (G). Cyert and March (1963) argue that firms pursue goals or aspiration levels. Four of the most important goals are (a) choosing high value project, (b) increasing the accuracy of the investment decision, while reducing the organizational resources required for the decision, (c) reducing the controversy in investment decision, and (d) decreasing uncertainty in investment. The next assumption expresses them.

Assumption: \( G_v \geq 0, G_b \geq 0, G_c \leq 0 \) and \( G_u \leq 0 \).
SCBM is a special case of OCBM

Let us start from the formal definition of standard capital budgeting model (SCBM).

Definition: SCBM is the solution of $s$ to maximize $B$ given $k$.

$$SCBM(k) = \arg\max_{s} B \text{ for a given } k \text{ and } s \in S.$$  

Under well defined first- and second-order conditions, SCBM($k$) solves $B_s(s, k) = 0$. I define SCBM as the most accurate method of valuating a project in consideration of effort. Numerous textbooks and articles discuss NPV and its variations, rationalizing them as accurate tools for investment decision. In addition, NPV is flexible enough to account for the cognitive or organizational costs. An analyst can change the assumption or a specification of an NPV model, so that she can make it simple or sophisticated depending on the preference and the opportunity cost of doing the analysis. For instance, it is possible that she performs valuation only up to satisficing level to reduce the cognitive resource. Thus, SCBM covers the case of bounded rationality and heuristics. However, given this formulation, it is clear that SCBM is not always the best valuation method to maximize the organizational goal. In contrast, SCBM is optimal only in special situation.
Lemma: SCBM (s*) is the optimal valuation strategy if and only if

\[
G(V(s^*, k), B(s^*, k), C(s^*, k), U(s^*, k), X) \\
\geq G(V(s, k), B(s, k), C(s, k), U(s, k), X)
\]

for all \( s \in S \) and \( k \in K \).

Notice 'if and only if' in the proposition. SCBM is in general suboptimal valuation strategy (even without social factors). Let me illustrate why we need 'if and only if.'

Suppose that a firm has two projects and two valuation methods: \{alliance, integration\} x \{NPV, interview\}. NPV is a representative SCBM. Expert interview is a popular qualitative method that firms use before launching new projects. The sets of projects and valuation methods generate the following hypothetical table as a value space. The first and second numbers in parenthesis are value and net accuracy, respectively.

<table>
<thead>
<tr>
<th>(V, B)</th>
<th>Alliance</th>
<th>Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPV</td>
<td>(-1, 1)</td>
<td>(1, 1.2)</td>
</tr>
<tr>
<td>interview</td>
<td>(10, 1/2)</td>
<td>(-10, 1.2/2)</td>
</tr>
</tbody>
</table>
Clearly, the firm is in dilemma. On the one hand, NPV is always more accurate and supports integration. On the other hand, while interview is less accurate, it is overwhelmingly for alliance and against integration. Thus, even if the firm perceives NPV as the most accurate valuation strategy, the firm may not always choose (integration, NPV) pair instead of (alliance, interview). One solution is Bayesian encompass taking weighted average of the qualitative and quantitative information in the example. However, it is a semantic issue whether we can call it as SCBM. We may not want to call the linear combination of NPV and a qualitative index SCBM. Rather than arguing that everything is the variation of NPV, I set the boundary of SCBM in order to find richer implications. The problem in the example is that the ordering of perceived value (V) changes significantly as the valuation method (s) changes. If all \( s \in S \) generate similar ordering, such problem would not exist. In this case, however, there is no reason to stick to NPV over other methods because all methods produce similar results.

Lemma: Suppose social factors do not exist. If \( V_s = 0 \) for all \( s \) and \( k \), SCBM is always the optimal valuation strategy.
I allow more general class of SCBM than commonly presumed ones. For instance, I dispute the common conjecture that a firm always chooses the highest NPV project when NPV is the only available method. Suppose NPV is the only valuation method a firm has. (V, B) pair for project can be,

<table>
<thead>
<tr>
<th>(V, B)</th>
<th>Alliance</th>
<th>Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPV</td>
<td>(1, 2)</td>
<td>(2, 1)</td>
</tr>
</tbody>
</table>

In this situation, the firm values Integration the twice of Alliance, but only with half of the accuracy. It might be hard to model the post-integration situation or to consider all complexities involved in integration contracts. It is uncertain which strategy the firm selects. Then, when does a firm select the highest NPV project? The next lemma answers the question.

Lemma: Suppose social factors do not exist. If \( V_s = 0 \) and \( \Delta V_s / \Delta B_s \geq 0 \) for all s and k, a firm selects the project with the highest value measured with SCBM.

If the perceived value and accuracy tend to move with the types of projects, we have the well-known situation of choosing highest NPV projects. In sum, SCBM is in
general suboptimal method of valuation. In addition, even if SCBM is the only valuation tool a firm has, it is suboptimal to select a project with highest NPV.

Social factors and the deviation from SCBM

Next, let us discuss the importance of organizational and social factors. Without loss of generality, let us assume $V_s = 0$ and introduce only the controversy with a weighting parameter $\delta$. Then the goal becomes $G(V, B, \delta C)$. The formula reverts to the previous with $\delta = 0$. I will show that $\delta$ increases the deviation from SCBM. The first-order condition with respect to $s$ and $k$ becomes:

$$ G_b B_s + \delta G_c C_s = 0. $$

$$ G_V V_k + G_b B_k + \delta G_c C_k = 0. $$

The first equation in the first-order conditions is relevant because it expresses $s$ as the implicit function $k$ in consideration of $B$ and $C$. Let us rewrite it as: $B_s = -\delta G_c C_s / G_b$. In contrast to SCBM, we do not have $B_s = 0$ unless $\delta$, $G_c$ or $C_s$ is zero. $\delta$ and $G_c$ have the same intuition to determine the relative importance of controversy. $C_s$ specifies how sensitively people respond to the change of valuation method. The same intuition holds for uncertainty ($U$). Thus, we have following proposition.
Proposition: Suppose $V_s = 0$ for all $s$ and $k$. SCBM is always optimal valuation strategy if

1. The relative importance of social factors, controversy and uncertainty, are zero, or
2. The sensitivities of social factors with respect to valuation methods are zero, or
3. The social factors cancel their effects each other.

As the social factors become important, an organization needs to balance the impact of valuation strategies on accuracy and on social factors. $G_{B_s}$ term measures how the change of valuation strategy affects the level of accuracy and consequently the organizational goal. In case, accuracy is the only concern of valuation, an organization would change valuation method until the marginal value of further change becomes zero. By definition, such a valuation method is SCBM. Note $G_{B_s}$ is always positive.

On the other hand, $-\delta G_{C_s}$ is the cost of changing valuation strategy. The change in valuation method generates social impact by $\delta C_s$, which in turn affects the organizational goal by $G_c$. Given this cost, an organization cannot mindlessly pursue accuracy in valuation, but allows valuation method to deviate from SCBM in order to
balance the social factor and accuracy as: \( G_e B_s = -\delta G_e C_s \). The next empirical predictions summarize such an intuition.

Proposition: To denote NSCBM (organizational model) = OCBM\( \setminus \)SCBM; (1) The more important the social factors become, the more NSCBM is used; (2) The more sensitive the social factors become with respect to valuation methods, the more NSCBM is used. Social factors include controversy and uncertainty.

In addition, I generate following lemma by integrating the proposition and previous discussion about Bower (1970).

Lemma: When both controversy and uncertainty are high, capital budgeting converges to Bower Model (Bower, 1970).

Let us illustrate the role of social factors with simple examples. The next table illustrates two distinct valuation strategies in which the perception on the risk differs. For instance, both methods can be NPV, but with different intuitions. Alternatively, they can be quantitative or qualitative methods.
### Table 4: Social Factors and Valuation

<table>
<thead>
<tr>
<th>(team1, team2)</th>
<th>Perceived accuracy</th>
<th>State 1 (Prob. = 50%)</th>
<th>State 2 (Prob. = 50%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method 1: High diffusion</td>
<td>50%</td>
<td>P1:(100, -60)</td>
<td>P1:(-60, 100)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P2:(15, 15)</td>
<td>P2:(15, 15)</td>
</tr>
<tr>
<td>Method 2: Low diffusion</td>
<td>50%</td>
<td>P1:(50, -30)</td>
<td>P1:(-30, 50)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P2:(15, 15)</td>
<td></td>
</tr>
</tbody>
</table>

The shaded area denotes the selected combination of valuation strategy and investment opportunity (Method2, P2). To explain the situation,

- The realization of either state 1 or 2 is independent of systematic factors, i.e. idiosyncratic. This simplifying assumption prevents cash-flow fluctuations from influencing the discount rate of the project.
- The first column denotes two valuation strategies. Method 1 argues the diffuser distribution for P1 than Method 2 does.
- The second column denotes how much confidence the firm has about the accuracies of each valuation strategy. I assume they are same without loss of generality.
- The third column denotes what will be the returns to (team1, team2) from the investments P1 and P2 respectively if state 1 occurs. The fourth column shows the case of state 2.
- The first row shows that state 1 and state 2 are equally likely (50% each).
P1 creates controversies and two undesirable consequences. Most of organization can choose P2 over P1. First, the decision-making would be costly in terms of time and resources. Some subgroups in a firm may reject the project. The firm may have to design additional contracts to redistribute payoff after the project is over. Second, such controversies will make coordination and communication difficult in implementation stages. If implementation requires the effort of both subgroups, the losing group may sabotage the project.

Managers can communicate the choice in two ways. First, they assert that they used 'Method 1' and made suboptimal choice. Second, they declare that they used 'Method 2' and made optimal choice.

I argue firms will choose the second way of communication. The second way is less likely to create cognitive dissonance, easier to communicate and helps building consensus. For instance, firms can argue P1 does not fit their culture, goal or vision, which method 2 may take into account. Thus, a firm considers social factors and the easiness of communication while choosing method 2.

Corporate Social Responsibility (CSR) may imply similar situations. Let us consider (CSR-Low, CSR-High) projects, and (internal, external) stakeholders. Internal stakeholder is simply a firm.
Table 5: CSR and Valuation

<table>
<thead>
<tr>
<th>(Internal, External)</th>
<th>Perceived accuracy</th>
<th>State 1 (Prob. = 50%)</th>
<th>State 2 (Prob. = 50%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Method 1: High-diffusion</td>
<td>60%</td>
<td>CSR-Low: (100, -60)</td>
<td>CSR-Low: (50, -30)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CSR-High: (24, -2)</td>
<td>CSR-High: (12, -1)</td>
</tr>
<tr>
<td>Method 2: Low-diffusion</td>
<td>50%</td>
<td>CSR-Low: (50, -30)</td>
<td>CSR-Low: (25, -15)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CSR-High: (24, -2)</td>
<td>CSR-High: (12, -1)</td>
</tr>
</tbody>
</table>

Similar to before, Method 2 evaluates CSR-Low investment at half of benefit and costs in each state compared with Method 1. Method 1 proposes that CSR-Low is better than CSR-High from the perspectives of both the firm and social planner. If the firm uses Method 1 to evaluate CSR-Low, the investment at state 1 will benefit the firm by 100, but hurts environment by -60. At state 2, the payoff to the firm and environment is (50, -30). Thus, the expected payoff becomes (75, -45). Similarly, the pair (Method 1, CSR-High) produces expected payoff (18, -1.5). Thus, CSR-Low is better for the firm (75 > 18) and for the society (75-45=30 > 18-1.5=16.5). In comparison, when the firm uses Method 2, CSR-Low is better for the firm (37.5 > 18), but CSR-High is better for society (37.5-22.5=15 < 18-1.5=16.5). Consequently, without moral hazard, the firm should choose either (Method 1, CSR-Low) or (Method 2, CSR-High).

Given the highly negative consequence in state 1, CSR-Low project may generate controversies. Thus, the firm prefers CSR-High projects. CSR-Low project may be even infeasible due to the relationship with external stakeholders. Given the similar accuracy of Method 1 and Method 2, I expect the firm chooses (Method 2, CSR-High) pair over...
(Method 1, CSR-Low) or (Method 1, CSR-High) in consideration of communication. Below is another example of how communication consideration can change valuation method.

**Table 6: Information and Valuation**

<table>
<thead>
<tr>
<th>(team1, team2)</th>
<th>Perceived accuracy</th>
<th>State 1 (Prob. = 50%)</th>
<th>State 2 (Prob. = 50%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FINE</td>
<td>60%</td>
<td>P1:(100, -60)</td>
<td>P1:(-60, 100)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>P2:(18, 12)</td>
<td>P2:(12, 18)</td>
</tr>
<tr>
<td>COARSE</td>
<td>40%</td>
<td>P1:(20, 20)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>P2:(15, 15)</td>
<td></td>
</tr>
</tbody>
</table>

The valuation strategy FINE can distinguish state 1 and state 2, but COARSE cannot. However, P1 always generates higher expected return regardless of the valuation strategies. I propose that firms communicate the pair (COARSE, P1) in case (1) managers stop the valuation at COARSE, not proceeding to FINE, or (2) managers proceed to FINE, but only communicate COARSE as official. Case (1) arises because COARSE is good enough (satisficing) to make decision and communicate. Case (2) occurs because managers intend to make P1 legitimate without generating conflicts between team 1 and team 2, while maximizing firm value. Simply speaking, it is easier to justify (COARSE, P1) than (FINE, P1). Procedural justice generates more parsimonious example as follows.
Table 7: Procedural Justice and Valuation

<table>
<thead>
<tr>
<th>(team1, team2)</th>
<th>Perceived accuracy</th>
<th>P1</th>
<th>P2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domination</td>
<td>60%</td>
<td>(100, -60)</td>
<td>(15, 15)</td>
</tr>
<tr>
<td>Participation</td>
<td>50%</td>
<td>(50, -30)</td>
<td>(15, 15)</td>
</tr>
</tbody>
</table>

In the example, the pair (Participation, P2) is selected over (Domination, P1). The participation of team 2 in decision-making process may decrease the accuracy of valuation if the information of team 2 overlaps that of team 1 except pure noise. It is also possible that the participation involves very different valuation methods from the domination. For instance, the definition of costs can be politically determined in transfer-pricing conflicts (Granovetter, 1985). Nevertheless, participation in decision-making raises perceived procedural fairness. Procedural justice increases the satisfaction of teams and performance as a result (Lind & Tyler, 1988). Communication and participation also increase group longevity (Katz, 1982). Such social consideration leads a firm to choose (Participation, P2). I have skipped the toy example for uncertainty case and focus on controversy. Instead, one case study discusses uncertainty in a later section.

Intuition and conclusion

To summarize, OCBM admits SCBM as a special theory of capital budgeting. SCBM is optimal in special situations. OCBM is a generalized theory of capital
budgeting to explain broader patterns in which SCBM fails. I define OCBM as the set of valuation methods given an investment opportunity to maximize the goal of organization. The goal increases with financial factors (value, accuracy) and decreases with social factors (controversy, uncertainty). In comparison, SCBM is the valuation strategies given an investment opportunity to generate the most accurate ordering among projects.

SCBM produces the optimality in special cases such as: (1) A firm considers accuracy only. (2) A firm wants to maximize its perceived firm value, but the value and accuracy co-move with respect to valuation strategies and investment opportunities. (3) A firm wants to optimize social consideration, but social factors and accuracy co-move with respect to valuation strategies and investment opportunities. (4) A firm wants to balance value, accuracy and social factors when those variables all co-move with respect to valuation strategies and investment opportunities.

One of the most significant generalizations by OCBM is to model firms to make choice in value space, the two-dimensional space of valuation strategies and investment opportunities. This setting overcomes the dichotomy between valuation strategies and perceived value, which I argue an implicit assumption of SCBM. Rejecting dichotomy, OCBM makes it possible to model capital budgeting with fewer assumptions, to consider the social construction of the meaning of investment opportunities, to
incorporate organizational influences, and to generalize capital budgeting subject to the social and organizational influences. Intuitively, the absence social influence is the special case of social influence. Thus, SCBM is the special case of OCBM.

Importantly, simple firm value maximization is not a proper goal of firms when we expand the choice set of firms into the value space from just one dimensional space of investment opportunities. If the value maximization is the sole purpose in capital budgeting, a firm will choose the valuation methods that inflate the value of investment opportunities most. This case may be realistic to explain some extreme moral hazards such as Enron and the valuation of Level 3 assets by some investment banks in the middle of sub-prime turmoil, but with limited generalizability to other cases.

To explain how OCBM nests SCBM as a special case in further detail, first, SCBM is optimal when a firm considers accuracy only. SCBM maximizes accuracy by definition. Thus, when accuracy is the only factor, SCBM is the optimal solution by definition. This case is not clearly realistic because valuation is not an end, but a mean to conduct proper investment.

Second, SCBM is optimal when a firm wants to maximize its perceived firm value, but value and accuracy co-move with respect to valuation strategies and investment opportunities. This case admits that accuracy maximization is not the only concern in capital budgeting. Indeed, capital budgeting is for investment, which in turn...
is for increasing firm value. However, as I explained, the firm-value maximization cannot be the sole objective either when the choice set is value space. This problem disappears when accuracy co-moves with valuation. In this situation, a firm just applies a valuation strategy that inflates the value of investment opportunities most. And, by the assumption, the inflating method happens to be also the most accurate method. Thus, SCBM is optimal. However, this case may not occur often in practice.

Third, SCBM is optimal when a firm wants to optimize social consideration, but social factors and accuracy co-move with respect to valuation strategies and investment opportunities. It is possible that the objective of investment is purely to decrease organizational controversy or to resolve uncertainty in environment. I believe that we can logically understand the investment in corporate social responsibility activities (CSR) in this framework. Yet, besides such special cases, it would be hard to find an investment just for social consideration. In addition, this case is similar to the second case mathematically: just swap perceived value with social consideration. Thus, this condition requires that the solution to optimize social consideration happens to be the solution for accuracy maximization. Clearly, this case is as rare as the second one.

Fourth, SCBM is optimal when a firm wants to balance value, accuracy and social factors when the variables all co-move with respect to valuation strategies and investment opportunities. If all factors move together with respect to both valuation
strategies and investment opportunities, it is sufficient to optimize in one variable such as accuracy in order to achieve global optimality. However, this assumption of co-movement implies very specific and strong functional forms for value, accuracy and social factors. Thus, this fourth case is rare.

The above conditions have common property. SCBM is optimal if, at SCBM and an investment opportunity, the marginal values co-move with respect to both valuation strategies and investment opportunities for value, accuracy and social factors. Since the marginal value of accuracy is zero at SCBM, the marginal values for others should be zero too. If they are not, the optimality of SCBM to maximize the goal fails. In particular, the marginal values of social factors matter if the goal is sensitive to social factors and the social factors are sensitive to valuation strategies and investment opportunities. I call the first and the second as the importance and sensitivity of social factors, respectively. Thus, we have the propositions: The more important or sensitive the social factors are, the more NSCBM (non standard capital budgeting model) is used.

In conclusion, it is intuitive to understand SCBM as a special case of OCBM, or OCBM as a general theory of capital budgeting. In addition, such special cases in which SCBM is optimal is atypical. However, it is important to remind that OCBM is the extension rather than the rejection of SCBM, and makes sharper the boundary condition of SCBM in which SCBM applies. Knowing such boundary conditions and limitations
would help managers to understand and implement SCBM. While standard corporate finance textbooks details SCBM well, they usually neglect its boundary conditions. In contrast, OCBM warns managers against applying perfunctorily SCBM during capital budgeting without considering organizational and social factors.
4. Empirical Designs

I set each investment decision-making as the unit of analysis, which I call episodes. Some cases can consist of multiple episodes. Chaebols are the subject of my qualitative studies. Chaebols are economically important. They are large, global and diversified. They have shown interesting behaviors about corporate governance and strategy. They respond to global economic fluctuations sensitively (Chang, 2003, 2006). In addition, the findings from Chaebols are generalizable. Chaebols are the type of business group. Business groups are important elements of many emerging and/or recently industrialized economies, such as Korea, India, Taiwan, Argentina, and Japan. Such groups were also common in the emerging economies of the U.S. and Western Europe in the 19th and early 20th centuries.

It is important for this study to include different types of firm within the class of Asian conglomerates in order to enhance the generalizability of findings and theory. The logic to select the case study subjects is in the following order. First, I select target Chaebols. I consider two criteria for the selection: size and the discrepancy between cash flow and control right. Size denotes the economic significance of my subjects. Cash flow/control right discrepancy is an important characteristic of Chaebols. The large ratio between cash flow and control rights is also referred to as the separation of ownership
and control, an important property of East Asian corporations (Claessens, Djankov & Lang, 2000).

Table 8: Target Business Groups

<table>
<thead>
<tr>
<th>Company</th>
<th>Cash-flow right stake (%)</th>
<th>Control right stake (%)</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samsung*</td>
<td>4.41</td>
<td>31.13</td>
<td>7.06</td>
</tr>
<tr>
<td>Hyundai Motors</td>
<td>5.58</td>
<td>69.07</td>
<td>12.38</td>
</tr>
<tr>
<td>LG*</td>
<td>5.34</td>
<td>41.3</td>
<td>7.73</td>
</tr>
<tr>
<td>SK*</td>
<td>2.15</td>
<td>34.06</td>
<td>15.84</td>
</tr>
<tr>
<td>Lotte</td>
<td>10.53</td>
<td>48.58</td>
<td>4.61</td>
</tr>
<tr>
<td>Hanjin</td>
<td>12.42</td>
<td>31.76</td>
<td>2.56</td>
</tr>
<tr>
<td>GS</td>
<td>18.02</td>
<td>51.63</td>
<td>2.87</td>
</tr>
<tr>
<td>Hanhwa*</td>
<td>4.87</td>
<td>48.95</td>
<td>10.05</td>
</tr>
<tr>
<td>Hyundai Heavy Industries</td>
<td>11.32</td>
<td>27.93</td>
<td>2.47</td>
</tr>
<tr>
<td>Kumho</td>
<td>12.28</td>
<td>50.69</td>
<td>4.13</td>
</tr>
<tr>
<td>Doosan*</td>
<td>5.78</td>
<td>57.36</td>
<td>9.92</td>
</tr>
<tr>
<td>Dongbu</td>
<td>14.42</td>
<td>53.32</td>
<td>3.7</td>
</tr>
<tr>
<td>Hyundai</td>
<td>3.98</td>
<td>20.12</td>
<td>5.06</td>
</tr>
<tr>
<td>Shinsegye</td>
<td>24.76</td>
<td>39.99</td>
<td>1.62</td>
</tr>
</tbody>
</table>

(Source: Fair Trade Commission, 2003; * denotes selection. Cash flow right is the percentage of share ownership. Control right stake is the ownership through subsidiaries. CJ group, a fast growing Chaebol, is included while it is not in the list.)

Second, I select target subsidiaries in the selected Chaebols. I consider size and organizational significance to select the subsidiaries. Two factors determine the organizational significance. The first is strategic importance. Size, growth rate and large capital investments determine strategic importance. The second is the position in the
control or shareholding relationship, which determines the significance of a subsidiary to maintain the control rights in Chaebols. If a subsidiary embraces the de facto headquarters for a Chaebol, it is important in corporate control. If a subsidiary owns large shares in other subsidiaries, then it is important in shareholding relationship and corporate control. The next table shows the selected subsidiaries of the Chaebols for my case study.
Table 9: Case Subjects

<table>
<thead>
<tr>
<th>ID</th>
<th>Sector</th>
<th>Case context</th>
</tr>
</thead>
<tbody>
<tr>
<td>HL1, HL2</td>
<td>Electronics, Trading (LL1, LL2)</td>
<td>LL1 case describes how a firm purchases equipment to enhance the performance of main business. It keeps track of decision-making process to purchase equipment with the focus on the flow of information, the senders and receivers of information and their problems. LL2 shows the guidelines for small and large investments in regular situation.</td>
</tr>
<tr>
<td>HL1, HL2</td>
<td>A holding company to enter contents business (HL1), Gaming unit of an Internet company (HL2)</td>
<td>HL1 Co. is the de facto holding company of a conglomerate. The conglomerate has highly diversified businesses including finance, food and bio. In this case, HL1 Co. has not performed any financial analysis although they have made investment on new businesses. Strategy office has driven the investment. CEO and strategy manager have made the most of important decisions through series of discussions. HL2 is the on-line gaming unit of the Internet company, which in turn belongs to a conglomerate. This case describes how the firm makes investment decision to develop new MMORPG (Massively Multiplayer Online Role-Playing Game).</td>
</tr>
<tr>
<td>LH1</td>
<td>Telecommunication</td>
<td>LH1 is a telecommunication company and a subsidiary of a conglomerate. It organizes a taskforce and investigates new business opportunities in telecom and information technology sectors.</td>
</tr>
<tr>
<td>HH1</td>
<td>Energy</td>
<td>HH1 is an energy company. Some managers recommend several new businesses such as logistics and the collection of the Internet business.</td>
</tr>
<tr>
<td>OSN</td>
<td>Trading company</td>
<td>OSN case describes the organization and processes dedicated to generating new businesses in order to address organizational controversy and uncertainty effectively. OSN is a trading arm of a large Asian conglomerate.</td>
</tr>
<tr>
<td>UCI</td>
<td>Gas station operator</td>
<td>UCI owns gas stations, convenience stores and auto service shops. It regards the gas station network as the important resource to generate new businesses. The diversification into Internet businesses has particularly interested the firm. I pick the stage of idea generation because this stage is full of uncertainty and controversy over new businesses.</td>
</tr>
<tr>
<td>VII</td>
<td>Food and others</td>
<td>VII aims to become Global Food and Bio Company. The firm recognizes global marketing capability is the key to achieve the vision. Investment decisions are in line with vision.</td>
</tr>
<tr>
<td>IKU</td>
<td>Wireless</td>
<td>IKU case shows the routines and guidelines to conduct investment under large uncertainty. IKU is one of the largest and successful mobile operators in the global market.</td>
</tr>
<tr>
<td>IQU</td>
<td>Finance</td>
<td>IQU is a successful insurance company. It is one of the leaders in the domestic market in terms of both the size and the quality of its assets. It is well defined quantitative procedure for capital budgeting.</td>
</tr>
<tr>
<td>IOM</td>
<td>Heavy industry</td>
<td>This case investigates the process through which a subjective idea of people or teams acquires meanings through organizational processes. IOM manufactures and installs various plant components, such as steam turbines, hydraulic turbines, condensers, heat exchangers, and many others. The firm also provides various construction services including apartment complexes, roadways, power plants, and industrial plants.</td>
</tr>
<tr>
<td>ILM</td>
<td>Entertainment</td>
<td>ILM primarily engages in the value chain of motion pictures such as production, distribution and investment. The firm also produces and distributes music and game software, and operates theaters through a subsidiary. It recently renovates its organizational structure and internal labor market.</td>
</tr>
<tr>
<td>RTB</td>
<td>Mobile device</td>
<td>RTB is a handset manufacturer. One of the largest mobile operators in local market had set up the firm. This case analyzes routine, periodic or day-to-day budgeting problems.</td>
</tr>
</tbody>
</table>

Note: To simplify discussion and to hide the identity of the subjects, I will use IDs at the first column of the table to denote the subjects of case studies.
Data sources are interview, archive documents and media. First, I conduct semi-structured interviews based on a loose list of questions to ask the practices and contexts about internal capital allocation. Instead of enforcing the questions, I let the interviewees talk freely. They are professional or personal acquaintances, alumni of two top business schools in North Carolina and Boston, and referrals from former contacts. Those in the central strategy offices in Chaebols are important informants.

Second, I obtained many internal documents. I have tried to collect any type of document that contains information about internal capital market. Important sources of information are budget requests, business plans, spreadsheets, investment guidelines, and unofficial meeting memos.

Third, I searched media and analyst articles using Bloomberg and local news portals. The articles are helpful to understand the contexts of investments such as uncertainties, growth rates, shareholder reactions, government, labor union, top management comments, organizational changes, and legal issues.

I conducted 40 formal and numerous informal interviews. Formal interviews lasted approximately one hour. I supplemented the formal interviews with informal ones using the phone, Internet technology and casual meetings when I have questions. If possible, I crosschecked the collected information with other informants for consistency. I avoided using audiotapes because some interviewees were uncomfortable, and I
worried about the interviewees becoming less honest while being recorded. I frequently referred to interview guides of Huber and Power (1985) and Yin (1985).

Designs

I focus on the influence of two social factors to the choice in value space because social factors and value space are the central concepts of OCBM. The two social factors such as controversy and uncertainty influence the choice of valuation methods in two ways: size effect and sensitivity effect. The two effects are in line with the proposition in the formalization section of theory section.

First, the size effects measure the extent that the goal of organizations move in response to social factors, i.e. dG/dCU in which G and CU are organizational goal and social factors respectively. In OCBM, controversy and uncertainty are the social factors a firm should balance with accuracy and perceived firm value in order to accomplish its goal. The larger the impact of social factors on the goal, the larger the size effects. OCBM predicts that the larger the size effects, the more the use of non-financial and organizational models.

Second, the sensitivity effects measure the extent the social factors move in response to the choice of valuation methods, i.e. dCU/dS in which S is a valuation
method. In OCBM, the choice of valuation methods affects the extent of social factors. The larger the impact of valuation methods on social factors, the higher the sensitivity effects. OCBM predicts that the larger the sensitivity effects, the more the use of non-financial and organizational models.

We can construct four independent variables accordingly. They are the size and sensitivity of controversy and the size and sensitivity of uncertainty. Dependent variables are the methods or processes of valuation. I vary the four independent variables from benchmark cases in which social factors are minimal. The appropriate episodes in the case studies are identified correspondingly. The next table shows the operationalized version of the independent variables.
Table 10: Independent Variables

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Nominal definition</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>The size of controversy</td>
<td>What method firms use when they face controversy?</td>
<td>Planning vs. implementation, insider vs. outsider, related vs. unrelated projects, existing vs. new project, competition for resource, influence of existing institution, other conflicts among subgroups.</td>
</tr>
<tr>
<td>The sensitivity of controversy</td>
<td>What are the factors that affect controversy and what process/routines firms use to control the factors?</td>
<td>Allocation of control/ power, perceived relatedness/ synergy, perceived fit to vision/ objectives, ownership of projects, perceived capability to conduct projects</td>
</tr>
<tr>
<td>The size of uncertainty</td>
<td>What method firms use when they face uncertainty?</td>
<td>Lack of experience, information, and predictability, rapid change, unquantifiable success factors, industry trends</td>
</tr>
<tr>
<td>The sensitivity of uncertainty</td>
<td>What are the factors that affect uncertainty and what process/routines firms use to control the factors?</td>
<td>Routines/ guidelines for organizational learning, management of knowledge, strategy formulation, project identity definition</td>
</tr>
</tbody>
</table>

The empirical analysis investigates how valuation methods vary with the independent variables. I design the experiment in two ways for robustness. Following table explains the two designs.
Table 11: Empirical Designs

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Structure</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design 1</strong></td>
<td>I construct two-by-two matrix by varying social factors from a benchmark. Both size and sensitivity effects are integrated into one variable. The benchmark is the state with the little influence of social factors.</td>
<td>Find and analyze the cases with (1) no social factors, (2) only controversy, (3) only uncertainty, (4) both clear controversy and uncertainty</td>
</tr>
<tr>
<td><strong>Design 2</strong></td>
<td>Case studies are decomposed into episodes such as valuation criteria, guidelines and the steps in process. I regard the episodes as the unit of analysis and analyze the social contexts in which the episodes occur in order to extract social factors.</td>
<td>Include all cases and decompose them into finer episodes in order to match them with corresponding social contexts.</td>
</tr>
</tbody>
</table>

The first design is to show the intuition about how valuations vary according to the social factors. Instead of decomposing a case, I identify the cases that are clearly subject to (1) no social factors, (2) controversy only, (3) uncertainty only, and (4) both social factors. The size and sensitivity effects are integrated into one effect \((dG/dCU \cdot dCU/dS)\). Thus, the cases are devoted to the particular directional change of social factors. This first design resembles ANOVA table. This design also has the advantage of testing Bower (1970) within OCBM framework. The Bower model corresponds to high controversy and high uncertainty case. Thus, this design can examine whether OCBM includes Bower model as a special case. The appendix provides the case write-ups used in the first design.

The second design is more general. Since it decomposes cases into smaller episodes, it provides more data and makes detailed analysis possible. I arrange the
information to match observed practices in an episode into a change in social factors in order to exhibit the dependent and independent variables better. I provide the all cases in the second design as well as the first at

http://hyoungkang.googlepages.com/ocbm.html

The second design analyzes the data in the following order. First, we decompose the cases into methods and processes as well as understand the cases as a whole in order to create richer dependent variables. Second, we construct four independent variables. They are the size and sensitivity of controversy and uncertainty. Third, we match methods and processes with size and sensitivity of controversy and uncertainty. When we observe the size and sensitivity effects of social factors, we identify corresponding methods and processes. When we observe a method and process, we measure the extent of the size and sensitivity of social factors. In addition, whenever we have an emergent proposition during the process, we identify the types of size and sensitivity and methods and process. This process occurs iteratively, so that it provides us with additional intuition to ground further propositions.
5. Case Study Results

Table 12: Results from Design 1

<table>
<thead>
<tr>
<th>Low uncertainty/ High controversy (communication)</th>
<th>High uncertainty/ High controversy (strategy, Bower model)</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Main considerations are the vision and objectives of the firm, the role of the projects to achieve the vision, synergy with other divisions, and the complementarities with other projects</td>
<td>* Operation strategy is the most important part of valuation because it details the investment amount and schedule.</td>
</tr>
<tr>
<td>* The strategies are from qualitative analysis about customer, market and competitors. Other strategies are not simulated.</td>
<td>* The constructed operation strategy and investment plan is &quot;start small and remain flexible,&quot; &quot;Maximize intangibles we have,&quot; in order to reduce the concern of other subgroups. No financial models are used.</td>
</tr>
<tr>
<td>* The investment decision with a thick business plan</td>
<td>* Marketing and other analysis are conducted in order to show that the team has the ability and information to conduct projects</td>
</tr>
<tr>
<td>* The plan includes detailed and flexible financial model to integrate all new projects in single architecture, and to conduct simulation about current and future strategies in order to explain the strategies more convincingly.</td>
<td>* The output of the financial model is the set of justification and recommendations about strategies, implementation and organizations instead of valuation numbers</td>
</tr>
<tr>
<td>* The business plan is used to convince internal and external stakeholders</td>
<td>* Valuation is to confirm and elaborate strategy, not to determine the attractiveness of a project.</td>
</tr>
<tr>
<td>* IRR, payback, time to profit, EVA</td>
<td>* In sum, this case shows that finance follows strategy, instead of deriving an optimal strategy from financial analysis.</td>
</tr>
<tr>
<td>* Various cost-benefit analysis techniques</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Low uncertainty/ Low controversy (SCBM)</th>
<th>High uncertainty/ Low controversy (research)</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Little financial analysis (HL1, HL2)</td>
<td></td>
</tr>
<tr>
<td>* Focus on project definition, capability analysis, market analysis and strategy development. Then, it sets goals and develops implementation plans. The amount of investment is derived as part of the implementation plan (HL1)</td>
<td></td>
</tr>
<tr>
<td>* Focus on ethnographic research about users in order to find new games and to make investment plan in accordance. Assessment about learning opportunity (HL2)</td>
<td></td>
</tr>
</tbody>
</table>

* HL1, HL2: High Level 1, High Level 2
<table>
<thead>
<tr>
<th>Low uncertainty/ High controversy (communication)</th>
<th>High uncertainty/ High controversy (strategy, Bower model)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The subject is a communication company and wants to conduct related diversification in telecom and IT sectors. Knightian uncertainty is relatively low because this firm has related experiences and businesses. Controversy is high because the size of investment is large, the project can change the direction and organization structure significantly, and financial market prefers cash dividend and repurchase over new projects. The firm decided investment with a thick business plan. The business plan lays out in detail the vision of the firm, the role of the projects to achieve the vision, synergy with other divisions, and the complementarities with other projects. The business plan is used to convince internal and external stakeholders. The plan includes detailed and flexible financial model to integrate all new projects in single architecture, and to conduct simulation about current and future strategies in order to explain the strategies more convincingly. The financial model validates the vision. The strategies are from qualitative analysis about customer, market and competitors.</td>
<td>HH1 is an energy company. It wants to conduct unrelated diversification into logistics sector. Uncertainty is high because the firm does not have any experience or information in logistics. Controversy is also high for the similar reasons. It is challenging to legitimize a project when he knows he lacks expertise, and other people know he lacks expertise, and he knows other people know he lacks expertise, ad infinitum. Thus, the firm needs to communicate clearly: (1) the value that proposed businesses add in excess of the opportunity cost of using resources for other teams; (2) the research that allows the organization to make informed judgment; and (3) the capability that the team and the organization may have to do the businesses. Capital budgeting is constructed in line with the purposes instead of applying financial techniques. For instance, the constructed operation strategy is &quot;start small and remain flexible,&quot; &quot;Maximize intangibles we have,&quot; reminding the logic of resource-based view and real options. This strategy is not derived from financial analysis, but from the consideration on social factors. Operation strategy is the most important part of valuation. The firm uses financial model in a creative manner. The output of the financial model is the set of justification and recommendations about strategies, implementation and organizations instead of valuation numbers. In sum, this case shows that finance follows strategy, instead of deriving an optimal strategy from financial analysis.</td>
</tr>
<tr>
<td>Low uncertainty/ Low controversy (SCBM)</td>
<td>High uncertainty/ Low controversy (research)</td>
</tr>
<tr>
<td>This benchmark cases show the use of SCBM and the practices of accounting.</td>
<td>HL1 is a holding company with a subsidiary in online sector. Controversy is low because new project is a related diversification into contents sector. People in the firm understand the importance of contents sector for all projects. Uncertainty is high because there is no clear definition and understanding about the sector. Uncertainty is also endogenous as one interviewee say, &quot;It is not worthwhile to quantify business plan considering time and resource.&quot; The firm does not conduct any financial valuation. Instead, it focuses on project definition, capability analysis, market analysis and strategy development. Then, it sets goals and develops implementation plans. The amount of investment is derived in accordance.</td>
</tr>
<tr>
<td>LL1: electronics company * Investment guideline illustrated with the real situation of purchasing a machine. * Techniques: IRR, payback, time to profit, EVA * Evaluation and monitoring; Control and accounting are the main purposes of the process</td>
<td>HL2 specializes in on-line gaming. Without controversy, it plans to develop MMORPG. Uncertainty is high because industry lacks data, competition is uncertain, and single game can change industry dramatically. Instead of financial analysis, the firm focuses on ethnographic research about users in order to find new games and to make investment plan in accordance.</td>
</tr>
<tr>
<td>LL2: trading company * Investment guideline for moderate investment * Approval process * Various cost-benefit analysis techniques * Delegation process</td>
<td></td>
</tr>
</tbody>
</table>

Table 13: Descriptions from Design 1
Table 14: Results from Design 2

<table>
<thead>
<tr>
<th>Variable</th>
<th>Rationale</th>
<th>Valuation criteria (Case ID)</th>
<th>Related hypotheses</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Implementation concern</td>
<td>One of the important organizational goals during valuation is to facilitate implementation. The group that proposes the project is not always those who implement the project. Thus, valuation considers the coordination and conflict between proposal and implementation groups.</td>
<td>Valuation in order to determine schedule and required cooperation from other divisions (LH1); stress synergy in business model to draw cooperation (LH1); Codifying accumulated knowledge in models for implementation (LH1); Monitoring plan and indexes development in line with valuation model (OSN); Revenue and expense are regarded target, not estimation (OSN); financial value and execution are separate criteria (OSN); valuation model become the set of performance indicators during implementation (OSN, RTB); Performance indicators determine next period allocation (RTB); Qualitative risk factor analysis during implementation (OSN); Integrate research and valuation process to achieve formalization (IKU); Marketing managers assess and modifies valuation documents (VII); Marketing documents replace business plans (VII); Risk management system in valuation documents (RTB); Risk is separate consideration (RTB); Joint consideration of risk management, delegation and resource allocation in valuation process (RTB)</td>
</tr>
<tr>
<td>Variable</td>
<td>Rationale</td>
<td>Valuation criteria (Case ID)</td>
<td>Related hypotheses</td>
</tr>
<tr>
<td>----------</td>
<td>-----------</td>
<td>----------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Shareholders (dividend vs. investment)</td>
<td>Shareholders and management can have different idea about how to use internal capital. Shareholders may want dividend or stock repurchase instead of new projects. In this situation, it can be easier to communicate intuitive strategies, visions or relatedness than to report NPV. Shareholders may feel more comfortable to discuss the intuitive concepts than to investigate complicated and manipulative financial models, because such investigation requires more effort or costs. As a result, a project with intuitive or strategic appeal can be more likely to be selected than the projects with sound financial potential.</td>
<td>Emphasize corporate vision by quantitatively operationalizing corporate visions and the view on the future industry dynamics to discuss a project (LH1); The assumption of firm objectives and strategies become the assumption of the model in order to support strategy (LH1)</td>
<td>The more the conflict with shareholders, is the more important the strategic criteria in valuation.</td>
</tr>
<tr>
<td>Fit to firm identity and Conformity to norms</td>
<td>Firms face institutional pressures to conform to their existing identity or norms. Some firms want to create new identity through investments. The institutional concerns affect investment decision. Valuation process is useful to legitimize the decision because the decision appears as rational choice instead of institutional choice.</td>
<td>Reject small investment (OSN); use of strategy, process and organizational criteria (OSN, RTB); Strategic fit assessment in proposal (OSN, RTP); forbidden sectors (UCI); strategy criteria in early stage (UCI); criteria-based filtering of investment ideas in which many criteria are derived from objectives (UCI); Operationalize objectives and visions into the targets for revenue, expense and investment in order to use them in valuation (VII); Derive targets from objectives and visions and use them for valuation inputs as well (IKU); Conformity to long-term strategy (IOM); Derive investment objective from vision in order to assess investment (ILM); measure performance from the deviation of ideal types derived from firm objectives (ILM); operationlization of firm objectives to measure attractiveness and performance (all cases); Derive investment items or opportunities by operationalizing strategies (RTB)</td>
<td>The stronger the objective and vision: (1) the more the rejection of the small investments; (2) the more the use of qualitative criteria such as strategy, process and organization; (3) the more the restriction on sectors; (4) the more the operationalization of objective and visions in valuation models; (5) the more the replacement of estimates with targets; (6) the more the emphasis on long-term performance; (7) the more the use of valuation in performance evaluation; (8) the more the derivation of investment opportunities from the objective; (9) the more the communication requirements for nonconforming investments.</td>
</tr>
<tr>
<td>Variable</td>
<td>Rationale</td>
<td>Valuation criteria (Case ID)</td>
<td>Related hypotheses</td>
</tr>
<tr>
<td>----------</td>
<td>-----------</td>
<td>-----------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>C</td>
<td>Experience, relatedness issue</td>
<td>Firms often make decision about projects without prior experience. To conduct such projects, a project team must overcome the doubt and suspicion from the common knowledge of its ignorance over the projects. The detailed research about the project is a way to get over the doubts.</td>
<td>The less experienced the project team: (1) the more complicated the valuation models, (2) the more information incorporated in valuation; (3) the more detailed the implementation and operation criteria.</td>
</tr>
<tr>
<td>C</td>
<td>Competition for resource; conflict of interests</td>
<td>Internal capital has many advantages over external capital (e.g. pecking-order hypothesis). In addition, many firms are financially constraint. Thus, there is always competition over internal capital among subgroups in organizations. From the perspective of project teams, the valuation needs to increase the likelihood of winning the internal capital. From the perspective of the firm, valuation is the process to moderate competition, to elicit true information and to ensure procedural fairness.</td>
<td>The larger the investment, the higher the internal conflict and competition. The higher the internal conflict, the weaker the financial criteria in valuation. The higher the interdependency, the stronger the qualitative criteria. The more powerful the team, the more the internal capital to the team. The higher the internal competition: (1) the less the variation among cost-of-capitals, (2) the more the peer review in valuation, (3) the stronger the consensus building role of valuation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Qualitative assessment about fit and interdependency at integration stage (OSN); Feedback from other divisions (OSN); Low weight on financial analysis in integration stage (OSN); uniform cost of capital for all new business (OSN); &quot;Valuation facilitates the discussion among related divisions&quot; (OSN); same cost of capital (IQU); Construct valuation to introduce the opinion of related teams and to build consensus (LL1)</td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>Rationale</td>
<td>Valuation criteria (Case ID)</td>
<td>Related hypotheses</td>
</tr>
<tr>
<td>----------</td>
<td>-----------</td>
<td>-----------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Institutional influence (Existing institution)</td>
<td>In ideal situation, valuation is subject only to the information about projects. However, since valuation and capital-budgeting processes occur in organizational and social context, they are regulated by existing organizational orders and structure. Thus, existing institution influences the choice of valuation and capital-budgeting methods to influence the investment.</td>
<td>Different valuation methods for differently classified investment (IOM, ILM, RTB); Different hierarchy use different valuation (IOM, ILM, RTB); Internal heterogeneity in valuation methods (IOM, ILM, RTB); The amount of investment precedes valuation (OSN, IOM); Investment decision with voting (all cases); The influence of incentive system and performance evaluation to select projects because valuation criteria and performance criteria are similar (all cases).</td>
<td>The more detailed the classification of investment, the more diverse the valuation methods (Two similar investments can be assessed differently depending on classification). The more complicated the decision-making process, the more diverse the valuation criteria. The more varied the performance-evaluation criteria, the more diverse the valuation criteria. The more complicated the incentive system, the more complicated valuation criteria. There is close association between the job attributes and the valuation criteria (e.g. marketing team vs. marketing criteria, strategy team vs. strategy criteria, operational team vs. performance indexes).</td>
</tr>
<tr>
<td>Control and power</td>
<td>Power often influences what projects to select. The choice made by power emerges as rational or efficient decision through a particular choice of valuation method. In more subtle cases, valuation process is designed in order to assign power to some groups. This design also surfaces as rational and efficient system to individual employees.</td>
<td>Valuation as the exercise of control (RTB); Valuation to create micro-power relation (RTB); Joint design of valuation and control process (RTB); Valuation as the process of enforcing social orders such as corporate culture, objectives, value and norm (RTB).</td>
<td>The more the power in valuation process: (1) the more power in other tasks, (2) the more the monitor role in other tasks, (3) the more the decision in consideration of the interest of top management team. The shorter the power distance to the holders of control power, the more the power in valuation process. The shorter the distance to any power, the more the authority in valuation process. The more regarded as knowledgeable and elite in organization, the more powerful in valuation process, vice versa. (There exists complementarity between the power in valuation and the power for other tasks).</td>
</tr>
<tr>
<td>Variable</td>
<td>Rationale</td>
<td>Valuation criteria (Case ID)</td>
<td>Related hypotheses</td>
</tr>
<tr>
<td>----------</td>
<td>-----------</td>
<td>------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>dC</td>
<td>The impact to other divisions. The relationship with others.</td>
<td>The choice of valuation method can change the relationship with others. In addition, the choice of valuation method can change the perceived relatedness of a project with other groups in organization. If the relationship with other group is important to make a project successful, valuation should take into account such social relation.</td>
<td><strong>The more the relatedness among the groups in decision-making:</strong> (1) the more the argument about tangible and intangible relatedness in business model; (2) the more the real option argument in valuation; (3) the more the flexibility argument; (4) the more the emphasis on small initial investment; (5) the more the focus in learning opportunity; (6) the more the qualitative criteria about synergy; (7) the more the argument about the benefit to others; (8) the more emphasis on synergy; (9) the more bundled the business models.</td>
</tr>
<tr>
<td>dC</td>
<td>Dominance in competition over resources</td>
<td>The choice of valuation method can generate the power to draw more internal capital.</td>
<td><strong>The stronger the operationalization of vision in valuation criteria:</strong> (1) the more powerful during valuation process; (2) the larger the allocated internal capital.</td>
</tr>
<tr>
<td>dC</td>
<td>Fit to visions and objectives</td>
<td>The choice of valuation method determines the perceived fit of projects with company objective, visions and strategies. The distance from firm objectives and strategies determines the value of project, not the other way in which firm’s strategy is supposed to execute most valuable projects.</td>
<td><strong>The clearer the objectives of a firm:</strong> (1) the more the top-down approach in valuation; (2) the more discussion about capability, implementation, strategy and operation; (3) the simpler the financial model; (4) the more confirmatory the financial models; (5) the more the similarity between financial models and implementation manual; (6) the more the similarity between financial model and strategy development and simulation. <strong>The more the consideration of firm objectives, the more likely the approval of investment.</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Focus on the option to quit and the learning opportunities to others (HH1); Qualitative synergy assessment (OSN, RTB); Statement about synergy (LH1); Complex model to emphasize bundled services (LH1); Real option argument to stress small initial investment (HH1); Consultation process in new business consultation committee (OSN); Synergy assessment for financially rejected projects (IKU).</strong></td>
<td><strong>Qualitative model; (3) the more the flexibility argument; (4) the more the emphasis on small initial investment; (5) the more the focus in learning opportunity; (6) the more the qualitative criteria about synergy; (7) the more the argument about the benefit to others; (8) the more emphasis on synergy; (9) the more bundled the business models.</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Quantitatively relate vision and strategy with a project (LH1);</strong></td>
<td><strong>The more the relatedness among the groups in decision-making:</strong> (1) the more the argument about tangible and intangible relatedness in business model; (2) the more the real option argument in valuation; (3) the more the flexibility argument; (4) the more the emphasis on small initial investment; (5) the more the focus in learning opportunity; (6) the more the qualitative criteria about synergy; (7) the more the argument about the benefit to others; (8) the more emphasis on synergy; (9) the more bundled the business models.**</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Build model from strategy, not the other way (LH1); Translate strategy into variables in a model to justify the model (LH1); Confirmation about agreed strategies (LH1); Core competency, resource and capability analysis (UCI, IKU).</strong></td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>Rationale</td>
<td>Valuation criteria (Case ID)</td>
<td>Related hypotheses</td>
</tr>
<tr>
<td>----------</td>
<td>-----------</td>
<td>-----------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Ownership of project</td>
<td>The choice of valuation model can determine which teams should be in charge of a given project. In order to obtain a project, teams must select appropriate valuation strategies.</td>
<td>Argue how a team’s project is related with its main businesses. Stress the relatedness through capabilities, intangibles or core competency. Show industry classification is less important (HH1); compete to integrate profitable projects (OSN).</td>
<td>The more the attractiveness of a project by many subgroups: (1) the more diverse the valuation method across different groups such as strategy, implementation, organization and synergy criteria. The less the relatedness in production: (1) the more the emphasis on intangible relatedness by project teams, (2) the more the emphasis on knowledge effects.</td>
</tr>
<tr>
<td>Communicate the ability to conduct investment</td>
<td>The choice of valuation method can change the perception of others about the capability of a project team to conduct investment. The perception can determine the approved amount of investment.</td>
<td>Valuation focuses on showing off the knowledge about investment, operation and implementation (HH1)</td>
<td>The more the perceived incompetence about a project: (1) the more the ethnography in proposal; (2) the more the similarity between exploratory research and financial modeling; (3) the more the description and emphasis about strategy, implementation and organization; (4) the more the investigation on non-financial factors.</td>
</tr>
<tr>
<td>Lack of experience</td>
<td>The choice of valuation method depends on whether an analyst has experience in similar projects or not. Valuation model takes into account the extent of experience.</td>
<td>Refer to high-level strategies, objective and visions to assess a project qualitatively (LL1); Stress the option to quit when a team lacks the knowledge about a project. Refer to the option value to defend a team’s ignorance about projects (HH1); Find key success factors in new business instead of valuation and go directly into implementation strategy (HH1)</td>
<td>The less the experience in a project: (1) the more the emphasis on qualitative criteria; (2) the more the emphasis on learning and flexibility; (3) the more the use of financial model to develop execution strategies.</td>
</tr>
<tr>
<td>Variable</td>
<td>Rationale</td>
<td>Valuation criteria (Case ID)</td>
<td>Related hypotheses</td>
</tr>
<tr>
<td>----------</td>
<td>-----------</td>
<td>-----------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Lack of information</td>
<td>The choice of valuation method depends on the amount of information about a project.</td>
<td>Lexicographic valuation at initial stage using strategic and qualitative variables (OSN, UCI, IKU); Low weight on financial criteria in business plans (OSN); Valuation is the process to collect and to share information (OSN); Qualitative analysis on Porter 5-forces (UCI); Assign weights on expert opinion (UCI); Include idiosyncratic risk analysis in valuation process (IKU); Use targets instead of estimation in valuation (IKU); The results of valuation is not only attractiveness, but also the goal of the teams. Both inputs and outputs are goals (IKU); Same cost of capital for different projects (IQU); No financial model, but detailed research in each scenario. Analyze required capability and capital expenditure to implement a project without quantitative model (HL1).</td>
<td>The less the information about a project: (1) the more heuristics in valuation, (2) the less weights in financial criteria, (3) the more the use of financial model to collect and codify information, (4) the more the weights on outside opinion, (5) the more the consideration on the factors irrelevant in NPV calculation, (6) the more the discussion about idiosyncratic factors, (7) the more the emphasis on quantitative criteria, (8) the more the homogeneity in cost of capital in different projects. The higher the uncertainty about future capital expenditure: (1) the less the importance on financial criteria, (2) the more the emphasis on idiosyncratic risks, (3) the more the emphasis on Knightian uncertainty.</td>
</tr>
<tr>
<td>U</td>
<td>Low predictability and rapid changes</td>
<td>The choice of valuation method depends on the speed of the external change.</td>
<td>Disregard financial models (HL1); goal setting (HL1); Quantifying strategic options in terms of required investment (HL1); discount the importance of quantified information (HL2); learning opportunity (HL2); Stress flexibility and dynamic capabilities in valuation (OSN); describe risk management plan (OSN)</td>
</tr>
<tr>
<td>Qualitative variables (e.g. creative organization culture)</td>
<td>The choice of valuation method depends on the importance of qualitative variables to determine the performance of projects.</td>
<td>Set goals to acquire core resource in order to build creative culture (HL1); give up quantifying business opportunities in the Internet business (HH1); Valuation to allocate both quantitative and qualitative resources (RTB)</td>
<td>The more the importance of qualitative variables: (1) the less importance on financial models in valuation, (2) the more the similarity between valuation and goal setting process, (3) the more the similarity between capital budgeting and other managerial and intangible resource allocation.</td>
</tr>
<tr>
<td>Variable</td>
<td>Rationale</td>
<td>Valuation criteria (Case ID)</td>
<td>Related hypotheses</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>U Industry</td>
<td>The uncertainty in industry structure affects the choice of valuation method.</td>
<td>Scenario development instead of estimation. Select robust strategy (HH1).</td>
<td>The higher the industry uncertainty: (1) the less the importance on financial criteria, (2) the more the importance on the scenario and strategy development instead of estimation (3) the less the estimation of valuation variables (4) the more the selection of robust strategies is.</td>
</tr>
<tr>
<td>Structure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>uncertainty</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>dU Identity</td>
<td>The choice of valuation model constructs the identity of projects. The identity includes the definition, scope and relatedness of the industry, services and market with existing businesses.</td>
<td>Valuation to conceptualize and enter a growth sector, no financial model (HL1)</td>
<td>The more the ambiguity in the relationship with the existing business, the less the use of the financial models. The newer the industry, the more the emphasis on synergy. The stronger the convergence in different services (e.g. digital convergence), the less the importance of financial criteria is.</td>
</tr>
<tr>
<td>projects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>Rationale</td>
<td>Valuation criteria (Case ID)</td>
<td>Related hypotheses</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>dU</td>
<td>The choice of valuation influences the amount of information about a project in current decision making, the amount of information in future decision making, the amount of information of authorizers and related teams. The amount of information can affect firm performance significantly. Thus, organizational learning is an important consideration in the choice of valuation method.</td>
<td>Knowledge-impact analysis in valuation (OSN); The importance of recording the information about market in valuation routine (HL1); Flexible financial model to codify accumulated knowledge and to develop strategy in future (LH1); Flexible valuation model to incorporate different ideas (LH1); “Valuation is for confirmation of intuition (at idea generation stage)” (UCI); Searching and valuation are inseparable -- the exploration process in which valuation is used for searching and constructing new businesses as well as for evaluating identified opportunities (UCI); The routines to evaluate idiosyncratic risk and Knightian uncertainty in valuation process (IKU); Risk analysis after NPV (IKU); The importance of historical valuation in order to define performance targets (VII); Consideration to routinize valuation process (RTB); Format to learn the opinion of other divisions and analysis about the learning opportunities of engineers (HL2); Valuation model to communicate research and findings and to assist decision maker, not for valuation (HH1)</td>
<td>The more the heterogeneity in the knowledge in an organization: (1) the more diverse the valuation criteria, (2) the more complicated the valuation model. The higher the relatedness with other and future projects: (1) the more the analysis about organizational and strategic factors (2) the more the codification of knowledge in financial models (3) the higher the flexibility of financial model, (4) the more the room for extension, (5) the more the use of previous valuation models. The more the innovation in a project: (1) the more the use of new routines, (2) the more the extent of exploration, (3) the more the independence of risk analysis from financial analysis, (4) the more the similarity between valuation and performance evaluation, (5) the more the extent of codification of knowledge, (6) the more the tool for simulation, (7) the more the use of strategy development.</td>
</tr>
<tr>
<td>dU</td>
<td>The choice of valuation influences the development of strategies especially to enter new market or to conduct unrelated diversification.</td>
<td>Tool to simulate all scenarios and find robust strategies (HH1); Porter 5-force analysis in valuation criteria (UCI); Valuation as the design process of business architecture (UCI); Valuation for exploratiation (UCI); Valuation as the process of formulating strategies, not discovering attractiveness of a given strategy (IKU);</td>
<td>The newer the sector to enter: (1) the more and newer the strategic criteria in valuation, (2) the more the design of investment opportunities during valuation, (3) the more the qualitative assessment, (4) the more the tool for simulating strategies.</td>
</tr>
</tbody>
</table>

Design 2 generalizes Design 1. In the first column of the table, C and U denote the size effect of controversy and uncertainty respectively. dC and dU denote the sensitivity effect of valuation methods to controversy and uncertainty respectively.
6. Case Discussions

In the previous sections, I described the capital-budgeting practices of large Asian conglomerates. The cases tell us that capital budgeting practices deviate significantly but systematically from the textbook models (Standard Capital Budgeting Models). While SCBM breaks down, OCBM explains the patterns very well.

In this section, first, I summarize the previous cases of controversy and uncertainty. Second, I show how the cases studies confirm the major predictions of OCBM: The more important and sensitive the social factors, the more the use of non-financial and organizational capital budgeting models. Third, I summarize further propositions grounded from the case studies.

I will start with the discussion about benchmark cases in which social factors are insignificant and, therefore, SCBM is prevalent. Then, I discuss the cases in which social factors matter and, therefore, organizational models are prevalent.

Benchmark: When social factors are unimportant (LL1 and LL2)

In the cases of LL1 and LL2, social factors are unimportant. In addition, the social factors are insensitive to the choice of valuation strategies because the social factors are
pre-determined. Thus, social factors remain constant regardless the choice of valuation strategies.

In this situation when the level of both uncertainty and controversy are insignificant, SCBM is common. LL1 and LL2’s practices show this well. LL1 is an electronics company, and LL2 is a trading company. LL1 case follows investment decision-making process of purchasing equipment for its main business. LL2 shows the guideline for investment in regular situations. The nature of the investments implies low controversy and uncertainty in the decision-making. In addition, people perceive the level of controversy and uncertainty in the similar way regardless of the valuation methods they choose. They have norm, experience and data to understand the investments. Thus, the sensitivity of social factors is also low.

The decision-making process of LL1 shows that SCBM is used in three instances. First, since IRR is 20% and payback period is three years, managers conclude that the investment is valuable. The hurdle rate and the hurdle payback period are 14% and four years, respectively. Second, the financial department monitors the investment and concludes that project does not perform well, after comparing accomplishment and annual target. The annual target is a variant of SCBM. Such monitoring and assessment affect the investment at the next period. Third, the performance of investment and the compensation to related teams are defined with EVA. The three instances have common
characteristics. Pre-determined rules are applied, such as IRR, payback period, performance index and EVA, all of which belong to SCBM.

LL2 Co. case also illustrates the evaluation of projects in the absence of uncertainty and controversy. Small and minor investments (under $1m, modification or extension) are subject to SCBM while large/major investments use the mixture of SCBM and organizational models. LL2 uses both NPV and IRR for cost/benefit analysis of small investments. Payback period is also used in most cases although it is not required. NPV, IRR and payback methods belong to SCBM.

In contrast, the part for larger and important investment illustrates the use of organizational models. Large and important investment involves controversy and uncertainty. In this case, managers discuss the projects before approval process starts. During the process of authorization, funding, budgeting and purchase, other departments intervene to make the investment occur. Various subgroups also monitor and consult the investments. During the consultation, strategic criteria are applied with financial criteria. In addition, in order to convince other divisions, the project team introduces additional evaluation criteria in line with the requests from other divisions.

IQU case supplements LL1 and LL2 cases. IQU case is the benchmark case too because it investigates the capital budgeting when Knightian uncertainty and
controversy are low. As a financial institute, IQU believes that social and organizational contexts are irrelevant in allocating financial resources to various financial instruments. Only financial data matters. Little controversy or uncertainty exists in analyzing the financial data with standard risk management techniques. IQU uses quantitative process to allocate internal capital. The firm measures risk with VaR. The higher the VaR, the higher the economic charge, and the higher the risk-adjusted capital. The ratio between economic earning and risk-adjusted capital becomes risk-adjusted return on capital (RAROC). RAROC is used both to allocate capital and to measure performance. Individual decision makers just make choice among projects without considering other valuation methods because the valuation strategy is exogenously given and implemented through internal system.

Deviation from benchmark

Next, I vary the four independent variables and observe the change of dependent variable from the benchmark case. The independent variables are the level and sensitivity of controversy and the level and sensitivity of uncertainty. The findings from my qualitative studies are at Design 1 (Table 12 and Table 13) and Design 2 (Table 14) of the previous section.
Design 1 discussion

Table 12 and Table 13 suggest how capital budgeting deviates from SCBM. When both uncertainty and controversy are low, we have the benchmark case. As we vary social factors, interesting patterns arise.

First, when controversy becomes important, valuation is similar to coordination and communication methods. LH1 is the case with high controversy. The subject is a communication company and wants to conduct related diversification in telecom and IT sectors. Knightian uncertainty is relatively low because this firm has related experiences and businesses. Controversy is high because the size of investment is large, the project can change the direction and organization structure significantly, and financial market prefers cash dividend and repurchase over new projects. The firm decided its investment with thick business plan. The business plan lays out in detail the vision of the firm, the role of the projects to achieve the vision, synergy with other divisions, and complementarity and synergy with other projects. The business plan is used to convince internal and external stakeholders that the vision of the firm is valid. The plan includes detailed and flexible financial model to integrate all new projects in single architecture, and to conduct simulation about current and future strategies in order to explain the
strategies more convincingly. The strategies are from qualitative analysis about customer, market and competitors.

Second, when Knightian uncertainty is high, valuation is similar to research and learning methods. Both HL1 and HL2 exhibit high uncertainty. HL1 is a holding company with a subsidiary in Internet sector. Controversy is low because a new project is a related diversification into the contents sector. People in the firm understand the importance of contents sector for all projects. Uncertainty is high because there is no clear definition and understanding about the sector. Uncertainty is partly endogenous as one interviewee say, "It is not worthwhile to quantify business plan considering time and resource." The firm does not conduct any financial valuation. Instead, it focuses on project definition, capability analysis, market analysis and strategy development. Then, it sets goals and develops implementation plans. The amount of investment is derived in accordance.

HL2 specializes in on-line gaming. Without controversy, it plans to develop MMORPG. Uncertainty is high because industry lacks data, competition is uncertain, and a single game can change the industry dramatically. Instead of financial analysis, the firm focuses on ethnographic research about users in order to find new games and to make a corresponding investment plan.
Third, when both controversy and uncertainty are high, valuation is similar to strategy development. Capital budgeting process is similar to what Bower model predicts. HH1 is an energy company. It wants to conduct unrelated diversification into logistics sector. Uncertainty is high because the firm does not have any experience or information in logistics. Controversy is also high for the similar reasons. It is challenging to legitimize a project when he knows he lacks expertise, and other people know he lacks expertise, and he knows other people know he lacks expertise, ad infinitum. Thus, the firm needs to communicate clearly: (1) the value that proposed businesses add in excess of the opportunity cost of using resources for other teams; (2) the research that allows the organization to make informed judgment; and (3) the capability that the team and the organization may have in order to execute the businesses. Capital budgeting is constructed in line with the purposes instead of applying financial techniques. For instance, the constructed operation strategy is "start small and remain flexible,“ "Maximize intangibles we have,” reminding the logic of resource-based view and real options. This strategy is not derived from financial analysis, but from the consideration on social factors. A detailed operation strategy is the most important part in the valuation process. In addition, market analysis, customer analysis and capability analysis are more important than financial analysis. While the firm has developed advanced financial model in spreadsheet, it uses financial model in a creative manner.
The output of the financial model is the set of justification and recommendations about strategies, implementation and organizations instead of valuation numbers. In sum, this case shows that finance follows strategy, instead of deriving an optimal strategy from financial analysis.

In particular, I observe that the capital budgeting process becomes similar to what the Bower Model predicts: the capital budgeting process addresses the high level of controversy and uncertainty. The roles of business-level, middle-level and top managers are also similar to what the Bower model describes. The following table relates Bower and HH1 case.


Table 15: Bower Model and HH1

<table>
<thead>
<tr>
<th>Environment</th>
<th>Bower Model Prediction</th>
<th>HH1 Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business-level managers</td>
<td>Initiation of investment request</td>
<td>Business proposal developed by a taskforce composed of business-level managers</td>
</tr>
<tr>
<td>Middle-level managers</td>
<td>Integration between business-level and corporate management</td>
<td>Review by managers in both HH1 and other subsidiaries; Review by corporate strategy office; Evaluation upon the strategy, goal, orders and guidelines developed in the level of corporate management</td>
</tr>
<tr>
<td>Corporate management</td>
<td>Design of structural contexts</td>
<td>Orders and guidelines from Chairman to develop new businesses</td>
</tr>
</tbody>
</table>

We can summarize the findings from Design 1 as follows. First, when social factors are insignificant, SCBM is used. Valuation is just the accounting exercise. Capital budgeting is the application of accounting formulas and the allocation of resources upon the results from the accounting models.

Second, when controversy is high, valuation deviates from SCBM and becomes similar to communication and coordination. The emphasis of capital budgeting is on legitimizing the underlying motives of investment. Financial models are designed to describe the motives, such as vision, direction, objectives and strategies, of investments. Financial models validate the motives in the end. The structure of investment is constructed to conform to those underlying motives. This is very different from stand
valuation process in which quantitative techniques are applied into candidate investments. To the contrary, firms elaborate and communicate their investments upon the underlying motives of firms. The motives become central during the debate in capital budgeting among interested parties.

Third, when uncertainty is high, valuation deviates from SCBM and becomes similar to research and learning. Firms can skip financial analysis. Instead, firms focus on analyzing external environment and internal capability. Then, firms develop the list of goals to build capabilities and the schedule for implementation. The amount of investment and corresponding resource allocation are just the subset of the research process. People review the investment focusing on whether the understanding about the investment is reasonable and whether the implementation plan is in line with the understanding. The review process is also the process of sharing and learning the information that the proposal team has accumulated.

Fourth, when both uncertainty and controversy are high, valuation deviates from SCBM and becomes similar to strategy formulation. This is similar to what Bower (1970) predicts. The findings are in line with the second and third discussions. Valuation should address communication and coordination and research and learning. However, in comparison to the third case (uncertainty only), financial modeling is essential. Financial model helps a project team to convince other subgroups that they have
checked all the important aspects of the projects and have the ability to conduct the investments. Financial model is to confirm pre-determined strategy and the simulation of implementation. Therefore, I describe the quantitative valuation process under high uncertainty and controversy as 'Finance follows strategy.'

Design 2 discussion

Design 2 generalizes Design 1. In the first column of the table, C and U denote the size effect of controversy and uncertainty, respectively. dC and dU denote the sensitivity effect of valuation methods to controversy and uncertainty respectively.

First, the finding confirms my major proposition. Numerous episodes show how the size and sensitivity effects cause firms to deviate from SCBM and to choose organizational models. We can summarize the pattern as:

- The larger the size effect of controversy, the higher the similarity between valuation methods and coordination methods.
- The larger the size effect of uncertainty, the higher the similarity between valuation methods and research methods.
• The larger the sensitivity effect of controversy, the higher the similarity between valuation methods and communication methods.

• The larger the sensitivity effect of uncertainty, the higher the similarity between valuation methods and the routines for organizational learning.

Coordination methods directly moderate the controversy between people or subgroups. Communication methods indirectly affect the controversy by increasing the flow of information or resource. The discussion of strategy is important to both coordination and communication, but in a different manner. For coordination under high controversy, one discusses strategy in order to justify a project. For communication under high sensitivity of controversy, one refers to strategy in order to make other subgroups have correct and deeper understanding about the project. Existing strategy is the means of communication because others share the consensus about the strategy. The discussion about relatedness is similar. For controversy, synergy discussion satisfies other subgroups and generates coordination to implement a project. It is a bargaining process and the coordination of interests. For the sensitivity of controversy, synergy discussion relates a project with the tasks of the other subgroups. Thus, the other subgroups can understand the project better and know their role during the implementation. It is a communication process. More discussion is in the next table.
Second, the finding generates further propositions to make the major propositions richer. For instance, communication and coordination and research and learning are not the part of major prediction. The concepts are grounded in the case studies. Importantly, the field studies support major propositions in diverse ways, so that I can generate more detailed propositions. These propositions collectively support and enrich the major propositions. Future research can test the propositions.

To conclude, OCBM is a general model of capital budgeting and nests SCBM or Bower model as special cases. The case studies collectively confirm the predictions of
OCBM. They also show the capability of OCBM to explain the heterogeneous behaviors of firms and to generate propositions for future research. In order to check whether such similar deviation occurs in other firms, I contacted the alumni and students of North Carolina and New Hampshire MBA programs, and several East Asian employees who work in non-Asian firms. I briefly explained the finding, and they said that they have experienced or observed similar practices in their organizations. To them, the finding of this thesis is "very obvious.” Future research can investigate whether OCBM holds in diverse organizations and whether the grounded propositions are generally supported.
7. Conclusion

Organizational Capital Budgeting Model (OCBM) is a general theory of capital budgeting that incorporates traditional theories and the consideration of the firm’s information and organization structure. The traditional financial capital budgeting model is a special case of OCBM. Therefore, OCBM not only broadens the traditional model, but also explains the heterogeneous behaviors of firms using quasi/non-financial version of capital budgeting. I demonstrate the validity of OCBM with multiple research methods. The field studies of Asian conglomerates are carefully constructed. The conglomerates are an important dataset to study organizational decision making because of their size, scope, controversial behaviors and global presence.

OCBM can generate rich managerial implications because it is both a descriptive and a normative model. OCBM is a descriptive model, but appears normative to individual decision makers. I develop OCBM to describe observed capital budgeting practices about which existing models offer only limited explanation. I enrich OCBM with multiple qualitative studies. The iterative process between theory and qualitative data develops OCBM. Thus, OCBM is descriptive. In addition, since I frame OCBM as an optimization problem that managers face, OCBM is a normative model.

I assume that investment decisions are rational on average. Then, with enough data, irrational behaviors or mistakes in valuation cancel out because average rational
actors do not make mistakes systematically. Since OCBM is the abstraction of data to find commonalities, it discusses average behaviors. Thus, it is a rational model. In turn, when we observe individual cases with the lens of OCBM, we may observe aberrant behaviors in capital budgeting. Then, OCBM can prescribe firms how to conduct valuation.

The rationality of OCBM needs further discussion. OCBM models the average behavior through contextualization, not through statistical technique. I cannot apply the law of large numbers given the dozens of qualitative studies. Instead, in ethnographic data, I explain what interviewees say about the rationale of practices and what I find in archival data about how organizational environment leads to the observed pattern. By comparing the data to the theories, I can abstract the findings to discuss what is and is not rational. Of course, readers can disagree about my interpretation and abstraction, and I do not contend that only my interpretation is true. What I can present as an alternative is to delineate this whole process, so that future researchers can propose disagreement and attempt alternative interpretations and theories. I believe this is typical academic discourse, whether data are qualitative or quantitative. Many papers illustrate how the same data leads to different interpretations depending on theories or econometric models.
OCBM argues that it is justifiable for managers to include financial, strategic, and organizational and process factors. Business plans include those factors. Therefore, we can argue that many firms make investment decisions on business plan, not only on NPV or on SCBM. The use of a business plan does not exclude the possibility that SCBM is still the only important criterion in decision-making. Business plans can be flexible enough to include SCBM and OCBM. However, it is unlikely that SCBM dominates OCBM.

First, a business plan may include only SCBM. This case is rare. None of my qualitative data, except benchmark cases, shows the case in which managers make decision only on spreadsheet that includes SCBM. Second, a business plan may include many non-financial discussions, but all converge on discussing the assumptions and outputs of SCBM. Thus, the output number of SCBM is the dominant criteria in a business plan. This method can be used for monitoring or repetitive investment. It is also similar to stock analysts’ report. Stock analysts recommend the investment strategies, based on target price, which is usually NPV, multiples, and discounted earnings. In order to support the assumptions of calculation, stock analysts tend to explain industry trends, accounting information and company policies in detail. Third, a business plan can discuss many non-financial factors with different levels of importance. Financial models are one of the many important criteria in decision-making. Sometimes,
financial models are used to communicate or confirm intuitions. I observe these cases most often. Fourth, a business plan may not include any quantitative discussion at all. If uncertainty is very high, managers may have to make too many assumptions or to spend too much time on quantitative analysis. In this case, financial analysis may not be a cost efficient way of decision-making. Goal setting or performance indexes can replace financial analysis.

Among these four ways, managers can choose the most appropriate to conduct valuation. The important considerations are controversy and uncertainty. When both controversy and uncertainty are low, managers regard the valuation process as pricing. When controversy is high, managers can use valuation process to communicate. When uncertainty is high, managers may view valuation as research process. SCBM is not necessarily the optimal means for communication or research.

When valuation becomes communication, managers need to investigate audiences. The mode of communication can be technical and non-technical, top-down and bottom-up, tacit and explicit. Managers can choose appropriate mode in consideration of target audiences and the relationship with them. Business plan for the valuation should be understandable. It is also the means to coordinate the interests of subcoalitions. For instance, business plans can be used as guidelines or instructions
during implementation phase. Managers need to tailor the valuation process and
business plan in order to fit them properly into the audience and communication mode.

When valuation becomes a research process, managers decide whether the
process should be exploratory and descriptive, evaluative and constructive. I find firms
often disregard financial models when business plan should provide exploratory
contents or when firms need to design the architecture of projects. In those cases,
valuation process becomes similar to searching process. Since the manner of searching
affects the architecture of new projects much, managers should keep in mind that
searching and valuation often become inseparable.

I consider the valuation process and business plan as the deliberate choice of
managers in value space. The design of business plan is similar to the choice of valuation
strategies (frames). The choice of projects is the choice of investment opportunity
(objects). In order to make this value space idea explicit, I propose a template below.
I suggest writing a report for each project. In each report, the first column presents OCBM variables such as perceived value, accuracy, controversy and uncertainty. Accuracy item includes gross accuracy and the required effort to achieve the accuracy. Controversy items can be classified in terms of audiences. Uncertainty items can be categorized with well-known strategy frameworks such Porter’s five forces, RBV, real option, . We propose that it is desirable to have the discussion of controversy and Knightian uncertainty in business plans.
The first row includes valuation strategies. They are financial criteria such as NPV, strategic criteria such as synergy, learning opportunities, and process criteria such as valuation process, implementation process, monitoring process, research methods and communication modes. The process criteria, which measure the contribution to processes, are most diverse and are expected to vary substantially across firms. It analyzes the implementation of objective of an organization.

In this value space, managers can fill the cells with numbers in accordance with the items in first column and row. Once numbers are filled, managers can pick only one cell, or select multiple cells in order to integrate them into the business plan. Managers iterate this process for each project. Managers can pick only one project or select multiple projects and combine them in order to design new business architecture. For instance, it is easy to transform each project into a numeric by assigning weights to both columns and rows. It is possible to use more complicated and creative formula. My suggestion is only one way to apply OCBM in selecting or constructing projects. As my qualitative studies show, firms implement OCBM in very creative and diverse manners. I encourage managers to be creative in applying OCBM.
Next steps

As a general theory of capital budgeting, OCBM suggest a novel way to understand the investment behaviors of firms. Therefore, OCBM idea can be specified or applied in many ways.

First, future research can formalize OCBM further. Some assumptions of OCBM can be modified. We may add other variables in addition to controversy and uncertainty. Since controversy and uncertainty are the summary concepts for broad social factors, we can divide them into smaller notions. I suggested some ways to formalize the concepts and to develop models. Numerous similar extensions are possible.

Second, we can conduct further empirical research about OCBM. I presented qualitative studies in the previous discussion, but suggest in the appendix that other empirical methods are useful too. I illustrate some methods such as survey and social psychological experiments in appendix link in (http://hyoungkang.googlepages.com/ocbm.html). In addition, we can extend qualitative studies for other international companies or non-profit organizations.

Third, we can develop a general resource allocation model. OCBM deals with capital, one type of resources. Organizations also manage other resources such as labor
and knowledge. As OCBM models internal capital allocation, we can construct an organizational resource allocation model in order to apply it to internal labor market and internal knowledge market. A highly general model to cover all internal markets for capital, labor and knowledge would be useful because firms should deploy all type of resources in integrated manner to generate superior performance. In this situation, such a general model would be the proper framework to assist firms to organize resources simultaneously.

Fourth, I suggest OCBM is also useful for economic history and other social science research. There have been investments since antiquity. Ancient societies administered large investments without formal capital budgeting models such as NPV. Since OCBM is a highly general model, it can analyze those investments. Similarly, OCBM is the useful and novel approach to investigate non-market investments such as corporate social responsibility and political investments.
APPENDIX 1: Selected Cases

All the other cases and the following ones are available at

http://hyoungkang.googlepages.com/ocbm.html. The link offers other discussions about OCBM that this dissertation cannot include. Readers can regard the link as the full appendix.

High uncertainty/ high controversy

When both uncertainty and controversy of investment opportunities are high, organizations not only try to understand the opportunities and to build expertise, but also need to legitimize it simultaneously. This is difficult. How can one legitimize a project when he knows he lacks expertise, and other people know he lacks expertise, and he knows other people know he lacks expertise, ad infinitum?

In this situation, if a team proposes new business, it needs to communicate clearly: (1) the value that proposed businesses add in excess of the opportunity cost of using resources for other teams; (2) the research that allow the organization to make informed judgment; and (3) the capability that the team and the organization may have to do the businesses.

The subject firm (HH1) in this case study is an energy company and the subsidiary of an Asian conglomerate. It has organized a taskforce to find new business
opportunities. The taskforce recommends several new businesses such as logistics and the collection of the Internet business. The proposed Internet business and logistics services share common properties. The businesses are very new, have the potential to change the structure of the firm. This proposal by the taskforce composed of business-level managers contrasts Maritan (2001) which argues that corporate management tends to initiate such new projects.

The taskforces should address several interesting issues. First, the firm has no experience in both of them. Thus, the new businesses are perceived to be highly uncertain to the firm. Second, they are apparently unrelated to the firm’s core businesses. Thus, the taskforce had to work hard to prove that the projects are relevant to the firm. The taskforce argued that the firm should use its retail network to diversify the firm toward logistics and the Internet. Third, financial analysis is not important in either business plan. The plan for Internet commerce does not include financial analysis at all. The logistics plan contains a financial model that mainly focuses on explaining various scenarios. Interviewers argue that:

.. given the constraints in time and resources, we have to focus on understanding market and developing strategies rather than working on financial models. Even if we develop quantitative models, people will keep asking underlying logic and be interested only in business ideas and strategies. They will not believe math. If they believe math or financial model, we would have been much comfortable. It is easy to build models....
Fourth, both plans emphasize that the initial investment is small and that the subsequent investments follow well-defined road maps. As with the real option argument, the taskforce proposes that the initial small investment would provide the learning opportunities about the true potential of the businesses. Main investments follow contingent on the outcome of initial investments. Such real option argument constitutes main logic to legitimize the projects together with resource-based view (RBV, Wernerfelt, 1995). The taskforce uses RBV argument to propose retail network as a strategic factor toward diversification. The real option argument is for mitigating concerns about risks and for convincing internal competitors to allow shifting internal resources to the projects. Because the proposed projects require only small investment in the beginning, competing teams would have fewer objections. The RBV argument suggests the close relation between the projects and the main businesses of the firm through retail networks. Showing the tight relation makes the projects more legitimate and understandable. Thus, communication is the important part of assessing new businesses. For simplicity, I will analyze the investment plan about the logistics service.

Background
There are two reasons why the firm wants to find new businesses. First, the chairperson of the conglomerate asks subsidiaries to find new businesses. The chairperson has the vision to make each subsidiary of the conglomerate to become global players in near future. To do so, he presumes that starting new businesses is the most effective way. The chairperson introduced a competition among subsidiaries to find new business. Second, in relation to the first, other subsidiaries want to use the firm’s key resources, i.e. retail network, to execute their new businesses. Nevertheless, the firm prefers starting own businesses to renting the networks. The firm worries that other subsidiaries would take all the glory from the success while the firm should work only behind to handle less prestigious tasks. In addition, sharing key resources may work against the firm when corporate reorganization occurs or at least when the performances of top managers are evaluated. The following is a quote from a top manager of the firm.

It is funny that the other subsidiaries propose new businesses upon our networks and assets. They neither ask our permission beforehand nor even seek our opinions.

Controversy and resolution
The project is highly controversial. The taskforce admits that people always complain about why an energy company wants to engage in logistics business. People have argued that it is not the core business, and that even if it is promising business, other subsidiaries could do the business better. In addition, the chairperson of the conglomerate has emphasized using intangible assets for new businesses. A logistics service uses few intangible assets, but involves large capital investment and human resources. To mitigate those concerns, the taskforce writes a business plan to communicate its strategies about logistics business. One interviewee summarizes the businesses as follows.

First, the business uses our intangible asset heavily, but minimizes capital investments. It uses the retail networks to access local customers and to build pick-up center. It forms the alliance networks with selected competitors and the Internet commerce sites to reach wider market with small risk taking.

Second, the retail network in combination with our new businesses will create customized experience for customers. In particular, the Internet business we suggest will create mutual benefits to both partners and us, and offer comprehensive services to customers.

Third, other subsidiaries will be our first customer. Thus, our distinct services can create synergies at the level of our group (conglomerate).

While RBV and real option arguments have been useful, the taskforce could not convince top management team. The headquarters of the conglomerate halted the project just before implementation.
Uncertainty and resolution

The taskforce views the project full of qualitative uncertainty. First, the firm has no experience in the business. Second, the logistics business depends on the evolution of the Internet industry. The more prevalent Internet commerce becomes, the more logistics demands increase. Everyone agrees that Internet commerce will continue to increase. However, it is not certain how quickly it will do so. In addition, the dynamics in domestic Internet commerce sector add uncertainty. As the price competition among the large Internet shopping sites intensifies, the profit margins of logistics services are likely to shrink further due to the pressures from the online malls. Third, many firms consider entering the market, creating uncertainty in the extent of future competition. Fourth, the cost of business depends on what logistics system the firm chooses and how to deal with logistic complexities. This complicates evaluating the business. The taskforce recommends combining the advantages of hub-spoke and point-to-point system. However, it is not certain how to relate the hybrid model with the firm’s retail networks. Fifth, a few portals dominate domestic Internet landscapes. Their behaviors will determine the fate of both internet and logistics business.
In order to respond to the uncertainties, the business plan describes market, operation strategies and investment schedule. The next section explains the contents of business documents in detail.

Structure of business documents

I have investigated business plans and discussion documents. They comprise the contents about business concepts, market, competitor, capability, marketing strategy, operating strategy and financial analysis.

Business concept: The business presumes that the growth of the Internet economy will make logistics services also grow. The firm plans to utilize the retail network to implement logistics services. The retail network can serve as pick-up centers and the platform to serve local needs. The business addresses logistics needs and provides services in combination with the Internet commerce activities. The business also brokers alliance online services and customers through both physical logistics and the links in web portal.
Market analysis: This section occupies the largest parts in the business plans. Market analysis focuses on the growth of the Internet and mobile business and the demand of the logistics services. The taskforce decomposes logistics services into three subsets: business-to-business (B2B), business-to-customer (B2C), and customer-to-customer (C2C). Each subset is related with the growth of the Internet business to estimate the future size. The taskforce finds that B2C is most promising. While the level of competition becomes higher, the taskforce argues that the Internet and Mobile commerce can change market substantially. Niche players that combine online and offline services are examples. The data sources for the market analysis are diverse, such as brokerage firm’s analyst reports, government documents, interviews and survey.

Competitor analysis: The competitor analysis follows several steps. First, the taskforce categorizes competitors into existing, niche and potential competitors. Second, it analyzes the competitors in terms of strategic goals, competitive advantages, performances, financial strength, product and services and business systems in order to derive the implication to the firm. This analysis yields the list of significant existing and potential competitors. Third, the taskforce analyzes the (expected) attributes of their services and products. This yields what position the firm should take. Then, the taskforce analyzes the situation when the firm will take the position. Fourth, the
taskforce derives alliance strategies the firm needs to win competition and to share risks. It also applies elementary game theories to describe expected market dynamics. While such competitor analysis static, it covers various topics comprehensively.

Capability analysis: The taskforce identifies five required capabilities: infrastructure, sales network, system to manage network, human capital and brand. The firm has good resources for sales network and brand, moderate resources for system and human capital, but none for infrastructure. The taskforce recommends several strategies to transform the firm’s intangible resources to core competence of the business in order to offer differentiated services and operation. For instance, the taskforce suggests using customer intelligence accumulated in other subsidiaries and formulating strategies in joint with them. The taskforce also provides the extensive list of intangible resources in five categories that the firm can use for the new businesses: knowledge, people, relationship, reputation and synergy with other subsidiaries. It also lists the required resources that the firm does not yet have. It lists the resources to acquire in the short-, medium-, and long-term and the related acquisition plans for the resources.

Marketing strategy: The business plan deals with marketing strategies. It is surprising to see such comprehensive marketing plans when the products and services
to offer are ambiguous and much uncertainty exists. I believe the development of such a detailed marketing strategy is part of market research. We will observe a similar intention in the financial model the taskforce develops.

The marketing strategy starts from customer segmentation. There are four major and several minor customer segments. Detailed segment profiles are given. The four major segments are premium, professionals, service centric and networks. The marketing strategy matches products and services to customer segments. It also analyzes the firm’s capability and relative position against competitors and alliance strategies in each segment. Those customer segmentation and profiles are based on customer survey and alliance survey and interviews. The next section presents some of the survey questions.

To customers

If xxx types of services are offered, how likely are you to use them? (5-point Likert scale)

In which services do you feel most uncomfortable dong online shopping? (1) price, (2) delivery, (3) purchase, (4) return.

To alliances

Do you offer delivery to customers? If you do not, what is the reason?
If customers increase by 10% due to new logistics options, how willing are you to pay for the service?

Are you interested in xxx types of services?

The fieldwork on customer and alliances becomes the basis to identify customer needs and characteristics, which constitute marketing strategies.

Operation strategy: Operation strategy and market analysis are the two most highlighted sections in the business plans. The roles are slightly different, though. Market analysis shows why the firm should conduct the project. The operation strategy shows why the firm has the capability to conduct the project. An operation strategy is composed of five parts: road map, model, products, profiting and management.

- Road map: The investment occurs in three stages (1) establishing market presence, (2) nation-wide coverage and (3) full service network. The key message is that the initial investment will be small and that it is easy to exit when business does not go well. In the Establishing market stage, the firm builds alliance relationship, on and off-line customer database and B2C basic services. The goal of this period is to identify competitive positioning. In the Nation-wide coverage stage, it establishes deep local and broad nationwide network. In the full service
network stage, it builds end-to-end system, starts global services and has solid market leadership. The business plan includes detailed spreadsheet that lists activities and their time lines every month for the next five years.

- **Model:** The business intends to maximize the usage of the intangible assets of the firm. For example, it will use customer information in other subsidiaries. While utilizing a retail network, it outsources the functions that require heavy capital investment or labor forces. A retail network has a central role in collecting customer information and recruiting. Customer service is the most important differentiating factor. The business starts from capital city. Other areas are serviced through outsourcing. The target city will be decomposed into four areas in which hubs exist. In order to function as the broker between vendors and customers, it is important to have payment system.

- **Product:** The business will have its sister online shopping sites. Given the focus on local information, the sites will be tailored to community characteristics. Such local services and the presence of retail network will create synergy. Local vendors and communities should be absorbed in alliance network. Therefore, the products have integrated services of commerce, contents and community.

- **Profiting:** One vehicle should perform 60 services per day. The demand from subsidiaries will be our initial revenue source. However, the business has other
diverse sources of profit. For example, the business can provide to alliance the services such as payment, return handling, producer-customer match and advertisement.

- Management: Brand management is important. The business will use the umbrella brand of the conglomerate, but should create distinct identity through creative services. Initial marketing is important. In addition, it is important to control alliances to maintain the firm’s prestigious brand. Uniform and vehicles design should communicate single message in line with conglomerate brand. Localized promotion activity is important. Marketing activities will target the customers visiting the firm’s retail network. The firm should convince alliances that they would expand their services without incurring extra costs much. For example, extra orders come from online services that the firm operates. Alliances can do advertisement easily based on the firm’s network and customer information. Delivery services will differentiate the alliances from competitors to grant them with competitive advantage.

Financial analysis: Financial model of HH1 is social/political model, but pretending to be SCBM. Financial model produces several market insights. The focus of
the model is not to compute NPV for investment decision-making, but to simulate strategies and the understanding about market. The output of financial model is the set of recommendations. First, the financial model finds that economy of scale is important for hub model, while pricing and cost leadership are important for end model. End model is built on the close connection between retail network and customers. Second, it finds that the firm should ensure end model to work as efficient as the model of incumbent players while providing some unique services based on firm’s intangibles. It recommends starting the end model at initial stage. Third, vehicles should process at least 60 services per day. In order to do that, it is not enough to rely on the demand from subsidiaries only. The firm should offer both B2B and B2C services to find additional demands. Fourth, financial model suggest charging 1.5 dollars per box. Fifth, it is important to start hub mode in later stage with economy of scale.

The financial model derives the recommendations based on scenario analysis. The first scenario is positive one in which the competition among market players are moderate, and the firm is successful to maintain operational efficiencies. The second scenario is negative in which competition is intense, and the firm loses the efficiencies in the operation of vehicles. In this case, the firm cannot generate profits and needs to position it as niche player. Niche play is to use retail network as pick-up center because
this service is expected to make profit even in negative situation. The third scenario is moderate in which the competition is at the current level, and operational efficiency is at the industry average. In this case, it is important to acquire the level of market share for economy of scale, and to differentiate the firm from competitors with broad services.

The financial model also includes sensitivity analysis on several factors. The first factor is vehicle efficiency. Vehicle efficiency affects all services. The second factor is market price. Because of the differences in price sensitivity, only some services are affected. This analysis also reveals the importance of unique services. The third factor is market share. The change in market share does not affect profitability ratios much, but the firm will lose competitive advantage due to economy of scale in the end. Sensitivity analysis concludes that the firm should focus on vehicle efficiencies to succeed in new business.

Both scenario and sensitivity analysis clearly show that the financial analysis is an organizational model. The purpose of financial analysis is not to evaluate investment opportunities and to decide whether to invest or not. Instead, financial analysis is designed to identify what strategic variables derive the performance and in consequence, what strategies the firm should take. Thus, it communicates and constructs business opportunities to develop.
It is important to note that finance follows strategy. One interviewee said, “If financial analysis is not in line with our strategies and intuition, there must be something wrong with the model.” The financial model is completely social/ political although it appears as a rational and sophisticated valuation technique.

Clash of ideas

The project team uses RBV and real option argument to support the new businesses. RBV argument is to rationalize the diversification strategy using the resource of the firm. Real option argument is to alleviate the concerns about the uncertainties in the project stressing the learning and the easiness in exiting from the project.

In comparison, opposing groups tend to use the argument of transaction cost economics and core competencies. While they admit that the resource of the firm is valuable for new businesses, they also point out that better arrangements can exist. The firm may not be the best organization to perform the project given its capability, experience and core competencies. In this situation, the conglomerate, other subsidiaries and even the firm would benefit if the firm could lend the resource to other organizations and share the profit from new projects.
The project team does not accept the idea. First, with the separation of ownership and usage of the resources, the users may abuse the resources. At least, it is possible that the alternative usage reduces the value of the resource for the main usage. The firm bears the responsibility of maintenance as the owner of the resource. Such misalignment of incentives between ownership and usage would create more problems for the firm. Second, it is difficult to measure the contribution of various groups to the outcomes of new businesses. Since it is difficult to measure the contribution, it is hard to design the compensation and other internal contracts. Third, such internal arrangement is generally not enforceable as the legal contracts in markets are. The parent company can change the corporate structure or top management team anytime. Such situation makes internal arrangement irrelevant to the firm. More seriously, the consequences of the projects can trigger the changes in organizational structure. For instance, if the new business upon the resource becomes successful, the people in the new business could take over the important position in the firm as well as the ownership on the asset. In the event of corporate restructuring, the current management of the firm may completely lose the control over the resources. Firm is a device to address hold-up problems. This case shows that hold-up problem can be even more serious in a firm due to the lack of enforcement devices.
In addition, the property right argument has been used, although not as frequently as RBV or real option, to settle the controversy. The firm is indispensable to the resource. An agent i is indispensable to an asset a if, without agent i in a coalition, asset a has no effect on the marginal product of investment for the members of that coalition. Hart and Moore (1990) show that if an agent is indispensable to an asset, then he should own it. The firm is indispensable to the resource because if the resource has no value as the retail network of the firm, the resource would lose the value for all other opportunities. The firm could have argued that the ownership should belong to the firm. Ownership means the residual right, i.e. the right to decide the use of assets except to the initial specification about the usage. The specialized definition of the residual right is the ability to exclude others from the usage of the resource. Thus, the firm could have argued that it should have the rights to exclude other parts from use.

Another relevant perspective is dominant logic view for diversification (Prahalad & Bettis, 1986). In dominant logic view, what matters is the cognition of top managers in diversification. In that sense, the firm may relate logistics service with energy businesses. This is exactly what occurred in the taskforce.

In sum, these perspectives have interesting implications. The debate in academia about firm boundary exists in business practices as ideologies. The managers select appropriate firm theories to conduct or to defend their projects. It is surprising that they
use firm theories even when they have never learned the theories such as TCE, property right theory of firms or RBV through formal education. The managers bear the theories from their experience, intuition and most importantly in the middle of controversy and struggle over resources.
### Table 17: HH1 and OCBM

<table>
<thead>
<tr>
<th>OCBM</th>
<th>Observation</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valuation strategy</td>
<td>NPV, IRR, simulation, strategies, capabilities</td>
<td>Sophisticated excel file to develop implementation strategies and to show off knowledge. Valuation for legitimacy.</td>
</tr>
<tr>
<td>Investment opp.</td>
<td>Active searching after the chairman’s order to find new businesses</td>
<td>Formulate project team to identify new businesses</td>
</tr>
<tr>
<td>Internal resource allocation</td>
<td>Retained earning. Needs the authorization from HQ of the conglomerates.</td>
<td>Legitimacy about why the firm should and can do the diversification. Internal competition to control strategic resources</td>
</tr>
<tr>
<td>Net accuracy</td>
<td>Dedicated analysts to build financial model</td>
<td>Complex excel file</td>
</tr>
<tr>
<td>Controversy</td>
<td>(1) Which team/ office will control the resource the firm has (2) how to convince chairman (3) why an energy firm should do transportation project</td>
<td>Communication for legitimacy: to prove that the firm has the ability to engage in diversification and should control the strategic resources of the conglomerate to conduct the projects</td>
</tr>
<tr>
<td>Uncertainty</td>
<td>Unrelated diversification: lack of knowledge and experience, Uncertainty in market structure.</td>
<td>Financial model is a tool to bear the knowledge about market and to communicate the details of project. The model is designed to justify the diversification.</td>
</tr>
</tbody>
</table>
Low uncertainty/ high controversy

As a project exhibits more controversy, capital budgeting becomes organizational. This section introduces the case with high controversy and low uncertainty. High controversy is either high disagreement or high conflict. High disagreement means that organizations and stakeholders have different ideas about whether projects fit them. High conflict means that teams in an organization compete over projects or exhibit misalignment in incentives. Low uncertainty means that organizations have good understanding of the business, so that they can specify various scenarios of projects and have consensus about them. Thus, low uncertainty and high risk can co-exist when highly diffuse distribution can be specified. This section illustrates such a situation.

The firm in this case study of low uncertainty and high controversy addresses the situation in the following way. First, it communicates the vision and strategy and builds consensus. They relate their projects with corporate vision and strategy to build legitimacy. The focus is on the motivation of projects. Second, the business plans state extensively why the projects can create synergy or are complementary to their existing business lines. Third, the business plans include flexible financial models to communicate strategies. The purpose of financial models is to show that the business indeed creates profits and synergies with suggested strategies. While the models are
flexible, they are more useful to communicate strategies and business plans rather than to predict reliably the amount of profit. The models answer issues and controversies that a firm has with particular strategies. The assumptions of the models are derived from the assumptions of the strategies. Thus, the financial models support the conclusion of strategies selected a priori, contrasting usual notion that strategies are selected ex-post using financial models. In conclusion, the financial models are in fact an organizational model beyond SCBM.

LH1 Co. is a telecommunication company and a subsidiary of a conglomerate. It organizes a taskforce and investigates new business opportunities in telecom and information technology sectors.

The primary motivation of new businesses is technological progresses. The new technologies make it possible to diversify revenue stream. In addition, the technologies significantly change the value chains of telecom and IT sectors and blurs the boundaries among industries, to pose challenges to telecom companies. The technological trends of telecom sectors are illustrated below.
The commercialization of 3G technologies is the behind the new business opportunities. Important 3G technologies are W-CDMA, HSDPA and CDMA2000 EVDO. Wide band Code Division Multiple Access (W-CDMA) supports a theoretical data transfer speed of up to 2Mbps (but is about 384 kbps in real world examples). High-speed Down link Packet Access (HSDPA) is a software upgrade for WCDMA that increases data download speeds. HSDPA improves the downlink packet access speed. The theoretical maximum downlink data transmission speeds using HSDPA are from 3.6 to 14.4 Mbps. Currently, there are 102 networks with HSDPA deployed in 55 countries. HSDPA is relatively new and the number of handsets and PC data cards using the service is still very limited. CDMA2000- EVDO is a 3G standard for CDMA technology. It stands for Evolution-Data. Optimized or Evolution-Data only. EVDO
provides data speeds of up to 2.4 Mbit/s with Rev. 0 and up to 3.1 Mbit/s with Revision-A. This CDMA upgrade to 3G is much more cost efficient than the upgrade to WCDMA for a GSM carrier.

The taskforce of LH1 selects range of new business opportunities in telecom and related sector in line with the technological progresses. It produces very comprehensive investment, which the firm assesses with a business plan covering strategy, implementation plan and valuation. My case study is based on the business plan documents and the interviews with those who produced the plan.

High controversy

The output of the taskforce has drawn much attention from other stakeholders for several reasons. First, the investment is large. Top management and shareholders have different opinions about how to use cash. Stock market tends to prefer more dividends or cash buy-back instead of starting new businesses. Thus, the firm should resolve the potential conflicts with shareholders and communicate the investment plan well. Below is a quote from a top telecom analyst. It expresses the concern over the large investment and dividend policy of the firm.
We believe LH1’s additional recapitalization on xxx and new investment in Internet business should remind investors of the company’s key investment risk - overseas expansion strategy. LH1 invested a total US$300m in xxx in 2007, representing 18% of 2007 expected free cash flow. We expect the investment decisions made today to serve as a negative share price catalyst given the unexpected and quite sizable investment decision and …

We expect significant selling pressure in the near term and recommend investors look for a lower reentry point at the low xxx level, given the following potential catalysts: stock buyback and good dividend play going into 4Q07E.

In a perfect capital market, dividend policy should not affect stock return according to Miller-Modigliani’s proposition. However, agency issues and information asymmetry make dividend policy influence the return of a stock.

Second, the strategy influences the direction of the firm significantly for the next several years. This affects the stakes of each division significantly. There are domestic marketing team, the Internet team, commerce team, global business team. The strategies will significantly affect their status.

Third, new businesses change organization structure. New businesses create new divisions. In addition, depending on how the businesses are allocated into existing divisions, the roles and responsibilities of divisions and people change.

Fourth, the new businesses cover broad areas and needs long-term investing. Thus, the sustained cooperation of other teams is crucial to make them successful.
Teams have different opinions and expertise about the projects. This can create conflicts at implementation stage.

Low uncertainty

New businesses significantly extend current businesses in tandem with technological advances. While the direction of future telecom industry is clearly volatile, the firm could describe the scenarios and their likelihood well. Such description is constructed in the organizational context and information of the firm. Thus, it is very likely to turn out to be wrong in objective senses. Nevertheless, the important point is that the firm can describe the situation, build consensus around it and make decision on it. The consensus is about the description of the situations and the random variables in projects. Different teams may posit different probability distributions on random variables. Teams can have different opinions about the importance of them to the firm. The ability of teams to describe random variables matters, so that they can argue and may reach consensus depending on the level of controversy. The ability to describe the situation is from their experiences. The firm is in IT/telecom sector. The new businesses are related diversifications.
This contrasts previous case of high uncertainty and low controversy in which the firms hardly quantify the value of investments. The reason is that the firms’ perception on the uncertainty is so high that they believe quantification unreliable or challenging.

The next section describes the financial model of LH1 Co. Financial models show how low uncertainty and high controversy transform standard capital budgeting models into more organizational models.

Financial model: OCBM pretending SCBM

LH1’s financial model exhibit several important points. First, it quantifies the strategies and future market dynamics in detail. Second, it addresses the issue of uncertainty with scenario analysis. Given that they could describe the uncertainty and make decisions on it, we can conclude that the firm perceives the uncertainty as risks. Third, the financial model is an organizational model pretending SCBM because it is built to describe and rationalize the business opportunities and strategies. The assumptions and framework of the model are in line with those presumed in strategies. An interviewer explains the model as follows.
We closely align the structure of financial model with the proposed marketing plan. The financial model also incorporates new product and services we suggest. The pricing for the products affect predicted demand and CAPEX dynamically. We have tried to model traffic size and use survey to design the financial model rather than just to use historical data. Thus, in future, we can use the model to develop market strategies and to assess various strategies... The model can do sensitive analysis and have several scenarios built in. For instance, it considers the dynamics of technology standard...

The financial model is indeed comprehensive. The spreadsheet takes into account more than 100 products, the attractiveness of which is qualitatively evaluated. The subset of the products and the combination of them determine the strategies and new business opportunities of the firm. The selected strategies generate highest revenues and profits. The revenues are from both larger market size and wallet shares. Wallet share means the share of individual customer’s spending among products. The assumption of market size and wallet size are set to yield highest profit in the suggested strategies. The assumptions are discussed with the format of market and competitive analysis in business plans.

In sum, the financial model is built to communicate the strategies. The strategies are derived not from financial model, but from customer, market and competitor analyses and other qualitative research. The financial model translates those framework and intuitions into numbers for confirmation and communication. The financial model serves other purposes such as experimenting strategies and various scenarios. In
particular, the financial model codifies important knowledge accumulated during strategies and business development so that the firm can use the model for future strategy developments. Thus, we can conclude that the financial model is not for finding best investment opportunities, but for confirming identified plans and codifying knowledge. The financial model is therefore organizational model, pretending SCBM. The next subsections highlight some part of financial model based on the confidential spreadsheets and documents that the interviewees provide.

Cost of capital

The cost of capital is reasonably close to the method that corporate finance textbooks suggest. The next table shows how WACC is derived.

Table 18: LH1 and Cost of Capital

<table>
<thead>
<tr>
<th>Weighted average cost of capital (WACC, %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk free interest rate : 5.0</td>
</tr>
<tr>
<td>+ Risk premium : 6.0</td>
</tr>
<tr>
<td>x Beta : 1.3</td>
</tr>
<tr>
<td>= Cost of Equity : 12.8</td>
</tr>
<tr>
<td>Interest rate on Loan : 11.0</td>
</tr>
<tr>
<td>- Tax : 3.4</td>
</tr>
<tr>
<td>= Cost of Debt : 7.6</td>
</tr>
<tr>
<td>Target leverage : 50.0</td>
</tr>
<tr>
<td>= WACC : 10.2</td>
</tr>
</tbody>
</table>
Three-month rate approximates risk-free rate. The taskforce estimates the risk premium based on both domestic and US data. Beta is past one-year regression coefficient of LH1 equity returns on the most popular stock-market composite index. Interest rate on bank loan and tax are from company data. Target capital structure is determined upon three sources of information: current capital structure, comparable firm’s capital structure and the interview with top management team. Interviewers decline revealing further information about target capital structure.

Ideally, the firm should apply different WACC to the projects if the projects show different cash flow streams, but the firm uses same WACC for all projects. Nevertheless, the method is close enough to textbook methods.

Costs

The next tabke shows cost model.
### Table 19: Cost Model of LH1

<table>
<thead>
<tr>
<th>Inputs to determine OPEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Subscriber Estimation: existing, new and migrating customers</td>
</tr>
<tr>
<td>- Revenue: traffic, non-traffic</td>
</tr>
<tr>
<td>- Historical Data: cost items and ratio</td>
</tr>
<tr>
<td>- HR: revenue per employee, functional compositions</td>
</tr>
<tr>
<td>- Marketing Plan: subsidy, agent, advertisement, promotion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inputs to determine CAPEX</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Network design: network and other equipments, sites acquisition</td>
</tr>
<tr>
<td>- System costs: equipment cost &amp; erosion, billing system,</td>
</tr>
<tr>
<td>- System costs estimation: historical data and estimation</td>
</tr>
<tr>
<td>- Licensing fee derived with technological assumptions</td>
</tr>
<tr>
<td>- Macroeconomics variables: interest rates, inflation</td>
</tr>
</tbody>
</table>

After examining the spreadsheets, I find that most of cost items are linearly related with revenue items (ratios in many cases). The linear relationships are either from historical data or from intuitions.

**Revenue model**

The revenue model starts from specifying customer segments. The values that customers expect from telecom services become the criteria to develop segments. Customer values are found through survey and telephone interviews. Two layers of customer segments exist. The first layer is personal and business users. Personal users
are decomposed into three groups based on demographics. Business users also have three sub-segments based on price sensitivity.

The customer segments are matched with marketing strategies, products and services that the firm has identified. More than 100 selected products are placed into groups: communication, the Internet, commerce and convergence.

The products represent several themes that the firm targets. First, they are premium services. Premium services tend to reach the break-even point earlier. In addition, it is easier to move high-end services to lower-ends than vice versa. Second, the firm intends to provide a broad range of services covering data, voice and multimedia applications and to customize them for customers. Such broad services will lead customer to perceive the firm as market and technology leader. Third, the firm will provide bundled services and tailor them for customers. These services benefit web users who are sensitive to personalized services. Fourth, the firm plan to provide contents in order to generate traffic through their networks. Fifth, it will design telecom devices (terminals) in order to align them with new products. Sixth, it plans to create distinct experiences for customers through the differentiated customer services. This strategy creates synergy with premium services. Finally, the services are structured in order to create higher brand identity such as Google and Apple.
Those themes should be realized through products and distribution channels in different ways in each customer segment. The firm’s documents provide very detailed and comprehensive descriptions about it. Those descriptions constitute the firm’s revenue model.

The revenue model shows that the framework of the financial model is the strategies that the firm has developed. The financial model quantitatively reproduces the strategies. Other possible strategies are less considered. In ideal situation, the firm could have designed the financial models in line with all the possible strategies in order to pick the right set of financial model and strategies. However, the process is too costly to develop the sophisticated financial model of the firm.

Resolving controversy

In order to resolve controversy, LH1’s strategy team creates the identity of new businesses. The identity should be in line with the firm’s core strategy and objectives. In addition, it should extend the strategy and objective to prove the businesses are innovative and value adding. Next is the key message to communicate the identity of new business in the organization.
We will become the leader with the advanced telecom/online products, quality features and broad content. We will build the capacity for constant innovation and provide a network and services, so that customers apply our innovative solutions to meet their needs. As a result, we will create the customers who are pleased to pay premiums for products that will increase the productivity and efficiency in their daily life and businesses. We will also provide the services in customized and targeted manners in order to save marketing and distribution costs. In addition, to address any regulatory issues, the strategy team develops the visions to be communicated to external stakeholders.

First, we will aggressively invest in new technologies and innovate ourselves to become a global leader in communication and content. We will be able to export technologies and create global alliance networks in near future.

Second, we will generate innovations in Korea. Our innovation will create beneficial externalities for other sectors and small firms. This will create jobs in various sectors and educate people.

Third, we aim to help the community to prosper through better services and increased productivity. We ensure sufficient coverage to permit as many people as possible the access to the Internet. Fourth, we will be ready to provide our innovative services to North Korea.

Lastly, a large part of the business plan explains how the new businesses create valuable synergies with the existing services and other teams. Smartly enough, the taskforce emphasize providing bundled, diverse and differentiated services, which can preserve the interests of other teams and prevent possible opposition. The next quote suggests the intention of the taskforce.

We specify how new businesses can be matched with existing businesses and teams. This may trigger further interventions from other and delays in the projects. However, we need their cooperation in future anyway during implementation.
Integrated marketing strategy is an example. It borrows the framework of the classic marketing strategy framework: 3P (product, price and promotion) and distribution. The next section illustrates how the team considers the role of others to obtain their cooperation.

Product: The firm offers broad services. It flexibly packages products and services. The packaging and distribution are based on customer needs. Customers also choose tailored services through personalized devices or portals. The firm will also provide incentives to encourage customers to use not only standard devices, but also more sophisticated ones such as PDA or hand-held computers.

Pricing: The firm will charge premium prices for novel products. Differentiated pricing plans are available. The price is set in line with costs in order to address regulatory issues and to provide incentives to associated teams. Packaging diverse services is the key to attract high-value customers and to differentiate the services.
Promotion: The marketing team will develop strategies to leverage our brand equity for new products. In particular, the firm will be proactive in the Internet, direct, and traditional advertising.

Distribution: The firm fully utilizes the current retail network. It is important to integrate direct and the Internet distribution channels creatively with the current retail network in order to sell our packaged products.

In sum, the capital budgeting of LH1 resolves high controversy by modeling coordination with other teams, incorporate shared corporate visions and objectives, and relating the shared goals with various revenue models. Business model is a quantitative way to create the identity of new businesses in order to build legitimacy.
<table>
<thead>
<tr>
<th>OCBM</th>
<th>Observation</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal</strong></td>
<td>Growth and legitimacy</td>
<td>Strategy and vision</td>
</tr>
<tr>
<td><strong>Valuation strategy</strong></td>
<td>Scenario analysis</td>
<td>Sophisticated excel file to communicate and simulate scenarios. The financial model is not for valuation, but for the legitimacy of strategy.</td>
</tr>
<tr>
<td><strong>Investment opp.</strong></td>
<td>Keep up with technological development and market changes</td>
<td>Find areas to focus</td>
</tr>
<tr>
<td><strong>Internal resource allocation</strong></td>
<td>Problem of how to allocate projects. Internal resource follows the projects.</td>
<td>Focus on communication and coordination.</td>
</tr>
<tr>
<td><strong>Net accuracy</strong></td>
<td>Dedicated analysts to build financial model</td>
<td>Detailed valuation model</td>
</tr>
<tr>
<td><strong>Controversy</strong></td>
<td>The size of investment is large: (1) which team/ office will control the projects (2) whether to return earnings to investors or to start new business.</td>
<td>Communication: create the identity of new businesses, develop the visions for growth, focus on synergy with existing businesses, suggest integrated marketing strategy, build legitimacy</td>
</tr>
<tr>
<td><strong>Uncertainty</strong></td>
<td>Large quantitative risk, but small qualitative uncertainty. This telecom company has much intuition about market.</td>
<td>Financial model is a tool to store the knowledge about market and to communicate the details of project.</td>
</tr>
</tbody>
</table>
High uncertainty/ Low controversy

As uncertainty increases, organizations deviate from SCBM. This section introduces two cases: HL1 Co. and HL2 Co.

HL1 Co.

HL1 is the de-facto holding company of a conglomerate. The conglomerate has highly diversified businesses including finance, food and bio. During the case study, we have investigated how they identify and evaluate business opportunities in contents. Interestingly, HL1 has conducted little financial analysis although they have made investment on new businesses. Strategy office has driven the investment. CEO and strategy manager have made the most of important decisions through series of discussions.

HL1 defines contents as both the copyright on products and publication right on the derivatives of the products. For example, the contents include the copyrights on movies, music, artists and books and the publication rights on DVD and cable TV.

HL1 decides to invest heavily in contents without much opposition in the organization. There are several reasons. First, HL1 sees contents as a key resource. HL1 and its parent company have the portfolio of businesses in movie, drama, animation,
music, game, production and performance. Those businesses are dependent on contents that they have to either buy or produce. HL1 identifies key contents and invests in creative people and system in order to generate the contents and, in the long run, to cultivate a creative culture. Second, HL1 has conducted detailed case studies. It finds that the copyright on contents tend to generate higher and more stable cash flows than the distribution of contents. Indeed HL1 has relied on the distribution of contents rather than production through theaters. Third, the profit from its current business has reduced while contents providers keep growing. Fourth, the bargaining powers of content-right holders have increased both in financial market and production market. Several mergers and acquisitions show that acquirers should pay very high premiums for contents providers. In addition, contents providers have intervened heavily in the distribution and development of related businesses. This shows the increasing power of contents providers in value chain.

Another important factor is that the strategy team in HL1 is a key organizer in the conglomerate. The strategy team is composed of the people recruited from various subsidiaries with certain qualifications. Given the central position of the team and the presence of elites, the team can make recommendation with great legitimacy. Once the subsidiaries accept recommendation, the elites of HL1 become mightier during implementation. In addition, since the diverse team members represent diverse
subgroups in the conglomerate, the strategy they have developed can gain the consensus of the organization more easily.

In conclusion, HL1 does have the clear consensus about contents businesses. Shared beliefs exist on the importance and urgency of contents production. The strategy team has the authority and reputation to get their recommendations accepted in the firm. Thus, the new businesses proposed by HL1’s strategy team are legitimate projects in the organization.

While HL1 has little controversy on the investments in contents, it admits high uncertainty on them. Low organizational controversy, while high uncertainty, helps us to filter out the pure effect of uncertainty. Uncertainty is high for several reasons. First, it is difficult to define the boundary of creative contents. The tendency of convergence in digital contents, service, devices, broadcasting and communication adds the uncertainty. Second, it is even harder to forecast future cash flows, risks and costs of doing business. Third, the success in the business of creative contents is highly subject to the creative culture of organizations. It is uncertain about what creative culture HL1 should build. In addition, the conglomerate is highly diversified organizations. The conglomerate, to which HL1 belongs, also has the broad businesses including finance, food and bio. The new culture may not be in line with the corporate culture that the conglomerate wants to maintain. Such high uncertainty has a strong effect on investment decisions.
Investment

HL1 decides to focus on visual content such as movies, games and dramas. While HL1 already has some presence in those areas, it needs to strengthen them because they are the core of contents and the source of sustainable competitive advantage of their entire business lines. In each area, it derives the required capability such as people, culture and system. For instance, HL1 draws social network of key people and computes the cost of hiring them or acquiring them through M&A.

Two considerations may determine the amount of the investment. The first is the required capability to achieve target market shares in movie, broadcasting, game and drama. The second is the relationship between the projects and the existing business lines to maximize synergies. The investment plan was included from FY 2006 budget ($500 million for the next five years).

Deviations from SCBM and organizational characteristics

The strategy team designs the investment plan and discusses it with the CEO. Until the investment is included in the next year’s budget, the strategy team does not
develop a financial model to evaluate the projects. Instead, they focus more on understanding market and developing strategies. They have not developed financial models because they have to assume too much to build a model, which makes financial model irrelevant to their purposes. The strategy team particularly mentioned several reasons. First, they cannot find reliable quantitative information about the contents industry because it is a new sector, and the market changes very quickly. Second, the boundary of industry constantly varies, which makes it hard to predict market size. Third, HL1’s strategy can significantly change the course of business. They cannot specify the strategies in sufficient detail to build a financial model in the early stages. Fourth, the cost of building the models outweighs the benefit because the team is already busy with conceptualization and strategies.

Instead, the strategy team has conducted extensive market analysis to find attractive investment opportunities. The market analysis suggests what target growth rate and profit margin should be for the next five years. The quantitative analysis is not for valuating existing investment opportunities, but for setting goals. Hence, valuation follows strategy. Strategic intuition defines the attractiveness of investment opportunities. Simple financial targets are generated to define the merits of projects. Below we describe the detailed assessment and valuation of business opportunities of HL1.
Conceptualization

HL1 (strategy team) starts from conceptualizing contents business. As discussed, HL1 views the contents as property rights. It investigates how contents can generate cash flows. HL1 investigates several success cases. For instance, it finds that a successful drama can generate both direct and indirect cash flows. Direct cash flow includes advertisement, domestic sales, international sales, video-on-demand (VOD) services and sponsorship. Indirect cash flows are OST, mobile downloading, ring back tone (coloring), characters, products, games and commercials. To illustrate, ‘All-in,’ a popular Korean TV drama, collects 87% of producing costs as advertisement revenues. In addition, it collects 0.2% through cable TV resale, 28% through VOD, 20% through exports, and 10% through OST. In total, it generates 60% of profit margin. Through the analysis of other case studies, HL1 decides to invest in contents. HL1 can also find the strategy to enter contents sector and to utilize the acquired contents.

Market dynamics
Uncertain and highly dynamic market environments are the challenges to HL1. First, regulators enforce intellectual property more strictly than ever. Second, the convergence between media and telecom sectors intensifies the competition over contents. Telecom companies (telcos) are particularly aggressive. Telcos have accumulated large cashes. The telecom industry has reached maturity. This makes large telcos invest aggressively in contents in order to acquire larger wallet shares (ARPU, average revenue per user) from their subscribers. Through M&A and large investments, telcos enter the most of business areas of HL1 and its parent company. Telecos have already acquired several large contents players. Third, technology changes quickly. Important issues are digitalization, 3D technologies, HDTV and the standardization of digital right management (DRM). Fourth, consumers’ preferences are ambiguous in that they become more willing to pay for digital contents, but keep using illegal contents. Their preferences also change very rapidly.

Prioritizing

The analysis on market and internal capabilities become the basis to prioritize contents areas. The top four areas are broadcasting, movie, game and drama. The next attractive areas for short-term profiting are publishing, animation, sports and internet
services. In the long term, the firm plans to start the services as news, advertising, adult and education.

Success factors

After HL1 decides to invest in contents, it investigates how to invest. No financial analysis occurs to decide how to invest. HL1 identifies three success factors. The first factor is to have creative people. Creative people generate creative contents. In addition, having creative people creates entry barriers because creativity is not easy to imitate. It is important to build long-term relationship with creative people rather than temporarily using them for production or casting. It is critical to learn their capabilities of producing creative contents and to share their reputation.

The second factor is system. It is important to have both a codified and tacit system such as the management of creative people and the process to generate creative contents. Such system can reduce risks in the business because systematic approaches and infrastructure contribute maintaining the certain level of quality in the changing environment.

The third factor is creative culture. A creative culture is important to retain creative people and system. The respect for ideas, the capability to implement them, and
the speed of decision-making constitute the culture. It is especially important to introduce a flexible and exceptional incentive system.

Building capability

Investment occurs in the following ways. First, HL1 needs 400 people for producing and planning and 100 people for marketing and sales. HL1 sees M&A as an important channel to acquire creative talents. HL1 writes the list of M&A targets and core people, and develops the budgets for them.

Second, in order to retain creative people, HL1 gives them the full discretion in creative activities. Specially designed incentives will be provided. Sign- and spot-on bonus, stock option and phantom stocks are examples. The firm should not discourage them from starting their own businesses. Instead, HL1 can absorb the entrepreneurial appetite through internal venture system. Creative people should feel that top management team has trust on them. In tandem, the firm educates the visions and cultures to new employees. The required budgets are determined in tandem.

Third, HL1 trains current employees into creative talents. Such a training program is not only a way to acquire creative talent at low cost, but also a scheme to introduce competition between new and existing employees. HL1 needs to consider
introducing a sabbatical month. Apprenticeships should be encouraged for knowledge sharing and development. The required budgets are determined in tandem.

HL1 spends much time to create the list of M&A targets. The list, which is confidential, includes the names, approximate acquisition prices, priorities, and the resources of the targets.

Two patterns of organizational learning emerge. First, a project is valuable if it generates learning opportunities under high uncertainty. Valuation methods assess the opportunities with strategic and qualitative criteria. They emphasize how to learn and acquire the capabilities. Second, a valuation process is valuable if it assists in the understanding uncertain subjects. Nevertheless, both approaches intend to reduce Knightian uncertainty through organizational learning in HL1.
Table 21: HL1 and OCBM

<table>
<thead>
<tr>
<th>OCBM</th>
<th>Observation</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal</td>
<td>Diversification into highly uncertain sector</td>
<td>Research</td>
</tr>
<tr>
<td>Valuation strategy</td>
<td>No formal valuation</td>
<td>Strategy formulation, capability building</td>
</tr>
<tr>
<td>Investment opp.</td>
<td>Recommendation from strategy office</td>
<td>Strategy office and top managers determine the investment.</td>
</tr>
<tr>
<td>Internal resource allocation</td>
<td>Use of retained earning in important area</td>
<td>Strategy office identifies key resource and capability to acquire</td>
</tr>
<tr>
<td>Net accuracy</td>
<td>Reliable quantitative valuation is difficult.</td>
<td>No financial valuation</td>
</tr>
<tr>
<td>Controversy</td>
<td>Shared understanding about the importance of contents business</td>
<td>Top managers determine the investment and order execution upon the recommendation of strategy office. No controversy exists about whether to enter the market.</td>
</tr>
<tr>
<td>Uncertainty</td>
<td>No data, hard to define the sector, no experience in implementation, the Internet, digital convergence</td>
<td>Focus on research about key resources and capability. The objective of research is to reduce the uncertainty during decision making and implementation. Decision making is very sensitive to what recommendation the research produces.</td>
</tr>
</tbody>
</table>
HL2

HL2 is the on-line gaming unit of the Internet company, which belongs to a conglomerate. This case describes how the firm makes investment decision to develop new Massively Multiplayer Online Role-Playing Game (MMORPG). MMORPG is a subset of role-playing game (RPGs) in which large numbers of Internet users play the game.

This case exhibits a low controversy and high uncertainty situation. First, controversy is low because on-line gaming organization invests in developing new on-line game. Second, uncertainty is high. Interviewers argue that "it is impractical to quantify the uncertainty in market demand and revenue." In addition, they think they "do not have time and resource to do quantification or to develop reliable financial models." The interviewers also argue that the performance of investments is broadly defined. The performance includes learning opportunities, the enhancement of dynamic capabilities and the complementarity to other teams. Those extra performances are hardly quantifiable.

Thus, this case illustrate that the level of uncertainty is endogenous because an organization balances the level of uncertainty and the use of organizational and cognitive resources. While there is extensive research on market, no serious quantification has been performed. The next section explains the decision-making
process about an MMORPG development. We omit some of the background discussions among the actors.

Place: Gaming unit of HL2

People: Paek (Chief of Strategy and Planning team), Cho (Assistant manager), Ju (Manager), Chang (Manager), Yoo (Director)

January 2, 2003: Mr. Paek, the chief of the Strategy and Planning team, notices that a competitor had launched a new MMORPG and drawn great number of users. He asks Assistant Manager Cho to summarize the research about the competitor and the game in order to find implications and take an appropriate counter-move.

January 5: Cho submits his research documents to Paek and Manager Ju. Paek hosts a Strategy and Planning Team meeting during which Cho presents his paper. The team decides to launch a new online game. Cho and Manager Chang, an MBA graduate, would write a business plan. There is no investment manual for the firm. Thus, Chang and Cho refer to previous documents and MBA class materials to write the plan. Paek said, “In the domestic gaming industry, solid tools for investment process and
evaluation rarely exist. Hence, investment and budgeting are rather ad-hoc. The developer’s will and the CEO’s insight affect decision making most. There are efforts to make evaluation and investment process more formal... Since gaming industry resembles that of movie making, we may be able to find benchmark there.”

February 10: The business plan is completed. Total investment to develop the required game is $3M including $2.5M for engineers and $.5M for server and software. ‘Cursory’ calculation suggests they need 25% IRR, 3-years payback and 2-years to make profit. These numbers will become goals.

February 11: After further discussions with Chang, Cho and other team members, Paek concludes that the business could fly. While Paek considers financial projection and goals, such information has only secondary importance. Qualitative analysis dominates quantitative information. However, Paek believes more sophisticated quantitative tools and systematic process might be helpful although he and his team neither have time to do so nor find it valuable at this moment. Paek says, “Intuition is most important to evaluate potential. We rely on the comparison with similar games and services and industry growth rate in order to come up with revenue projection. Expected monthly variable cost and depreciation of equipments such as
server and software give rough estimate of gross profit.” Paek also argues that learning is important. The experience of game developers matters. Thus, it is essential to assess whether the new business offers the learning opportunities to engineers. It is also very important to learn about service-driven games. Service-driven games are strategically more important than contents-driven games. Service-driven games collect service fee from users. Contents-driven games target advertising fees and intend to induce users toward service-driven games. New project can increase the capability of the firm to sell service-driven games more.

February 12: Paek modifies the business plan and circulates it to control and accounting teams to obtain their information. He also informs it to his boss Director Yoo.

February 14: Control and accounting teams require detailed information about manufacturing cost and target. Paek asks Chang and Cho to update the plan accordingly.

February 15: Paek hosts a workshop composed of the Strategy and Planning, Control and Accounting teams using updated business plan as text. They agree on financing: $2M is from R&D budget, and $1M is categorized as outside budget item.
drawn from last year’s retained earning. Typically, business plans, written in PowerPoint format, are used for presentation materials. The strategy team updates the business plan after the workshop.

February 16: Paek submits the plan to Yoo for approval. He circulates the submitted documents to Control and Accounting teams for review and elaboration.

February 18: Yoo approves the project.

February 19: Paek presents the business plan to the CEO and other executives. CEO asks executives to collaborate to make the project successful. CEO authorizes the project. The CEO can authorize investment on this kind of new business development. The Board of Directors approves the spin-off and acquisition of other game developers. Paek and his team will update the business plan and prepare it for implementation.

March 1: After the discussion with Strategy and Planning team, HR assigns game developers and administrative staff.

March 2: Task force for new online game is launched.
March 7: Purchase department buys the first lines of equipment.

February 2, 2004: Beta version of game is made.

July 2: Game development is complete. It takes six to eight months from planning to launch to manufacture a simple web-board game. However, it takes two years for large games such as MMORPG-SUN, Lineage II, World of Warcraft. $3M is medium size game and took about between a year and 18 months years to develop.

September 26: The leader of new game developing team submits a quarterly report to Strategy and Planning team and executives. The Strategy and Planning team has watched the performance of game since the launch. Because competitors are planning similar games, the number of users fell short of projection. Paek asks Chang and Cho to analyze business potential again and to find appropriate measures to assess the potential.

September 28: Chang and Cho recommend continuing investment despite early disappointment. They have conducted market and customer analysis and have
concluded that the business still has potential. Paek had asked Strategy and Planning team to develop new marketing strategies in cooperation with the Marketing team. The Marketing team agrees with continuing the investment with brief review. The Strategy and Planning team and the Marketing team not only agree on the continuation of planned investment, but also suggest increasing the investment. CEO authorizes the additional investment. Financial analysis is absent to determine the continuation of the investment.

October 11: Purchasing department begins purchasing more servers and software.

October 20: Employee evaluation for entire units occurs. There is no general evaluation method because each unit has adopted a different practice. Employee evaluation is composed of performance evaluation and ability (talent) evaluation. Performance evaluation is important for high-ranking managers. Thus, the performance of the current investment affects the evaluation for top managers greatly. Low-ranking employees are more subject to ability evaluation. Strategy and Planning team is less affected by the performance of specific investment.
December 19: The game team formally reports its annual performance.

December 23: Annual bonus is set. Each unit determined the bonus in a different way. Profit is computed for each project/game unit. If profit is over some level, the corresponding team receives an incentive. Spin-off teams often receive stocks.

Table 22: HL2 and OCBM

<table>
<thead>
<tr>
<th>OCBM</th>
<th>Observation</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal</td>
<td>Speedy development of online game</td>
<td>Jointly conducting research and implementation</td>
</tr>
<tr>
<td>Valuation strategy</td>
<td>No formal valuation</td>
<td>Focus on implementation and research</td>
</tr>
<tr>
<td>Investment opp.</td>
<td>Follow the competitors</td>
<td>Strategy team recommendation</td>
</tr>
<tr>
<td>Internal resource allocation</td>
<td>Use of retained earning in important area</td>
<td>Strategy office identifies roadmap and targets</td>
</tr>
<tr>
<td>Net accuracy</td>
<td>Not enough time and resource to conduct formal valuation. It is difficult to estimate the revenue from an online game</td>
<td>Skip formal valuation</td>
</tr>
<tr>
<td>Controversy</td>
<td>Little controversy: launching a new game is a natural project of gaming firms; Controversy arises only when the organization fails implementation target</td>
<td>Performance evaluation and compensation system</td>
</tr>
</tbody>
</table>
Low uncertainty/ low controversy

When the level of both uncertainty and controversy are low, SCBM is used. I will illustrate this proposition with two cases: LL1 Co. and LL2 Co. LL1 Co. is an electronics company, and LL2 Co. is a trading company. LL1 Co. case keeps track of investment decision-making process to purchase equipment with the focus on the flow of information, the senders and receivers of information and their problems. This case is based on true accounts of purchasing a machine. LL2 Co. case shows the guideline for certain types of investment.

LL1 Co.

Company: LL1 Co.

People: Mr. Jung (Assistant manager), Mr. Han (Salesperson), Mr. Kim (Manager), Mr. Park (Senior Manager), Mr. Yoo (Director), Mr. Hwang (CEO of business unit), Mr. Yoon (CEO)

May 1, 2002: Han is a salesperson in a Japanese machinery company. He visits Assistant Manager Jung in the R&D office at LL1 Co. to market a product.
May 2: After review, Jung concludes that the equipment can reduce the manufacturing cost of chips.

May 3: Jung informs his bosses, Manager Kim and Senior Manager Park. Park orders Jung and Kim to draft a planning document.

May 20: Kim and Jung’s document explains price, order quantity and background information about the Japanese vendor.

June 5: Park examines the draft and concludes that it merits further study. He instructs Kim and Jung to contact related offices (treasury, control and planning offices in the business unit) and to analyze the investment using standard financial techniques such as cost/benefit analysis, IRR and payback period.

June 13: After several meetings with related offices, Kim and Jung calculate IRR as 20% and the payback period as three years. The numbers satisfy the internal investment criterion of 14% and the four-year limit for hurdle rate and payback period.
respectively. They also conclude that the investment will make profit in one year which meets the three-year deadline.

June 14: After a long meeting, Park, Kim and Jung decide to include the investment proposal in next year’s budget. The Year 2002 budget is already allocated. The investment is not urgent enough to request outside-budget investment.

June 17: Park submits to Director Yoo the proposal to include the investment in the Year 2003 budget. He circulates the document to the treasury, control and planning offices.

June 18: Mr. Yoo authorizes the investment. Related offices also support it.

June 19: Mr. Hwang, CEO of the business unit, authorizes the investment.

July 21: Control office of the business unit discusses Year 2003 budget with control office of LL1 Co. many times. Both offices include the investment plan 2003 budget and finalizes. Business unit and financial departments of LL1 Co. headquarters should solve this kind of budget problem together.
September 1: HQ settles the budgets for its entire subsidiaries. Mr. Yoon, CEO of LL1 Co. authorizes the budgets.

October 1: Board of Directors authorizes 2003 budget.

January 12, 2003: The investment costs 20 million USD more than what Mr. Hwang can authorize, but less than what board of directors should deal with. Thus, management committee should approve it before execution. Mr. Yoo submitted the proposal to management committee composed of CEO, CFO, and other senior managers.

The Management committee allows the execution of investment after the board of directors approves the budget. For outside-budget investment, the Management committee or board of directors determine the budgeting and execution depending on the size of investments. The Management committee can reject or postpone the investment.
February 12: The purchasing department buys the equipment from the Japanese vendor. Based on the principle of real-name investment (no-anonymous investment), business unit and its R&D team take responsibility of the investment. The principle of real-investment stipulates that every investment should accompany the name of teams taking responsibility of the consequences in order to check whether or not the investment decision has been correct.

March 10: Financial departments of HQ perform a quarterly review of the investment using the realized cash flow and capex information.

October 2: Mr. Jung reports the financial performance of the investment to the treasury and control teams.

October 5: The financial offices conclude that the financial performance misses the annual target. They request explanations to the teams which is responsible for the investment.

October 9: Park orders Jung to write a report explaining the situation.
October 19: Jung argues that the performance would improve soon after engineers receive more training and become familiar with the new equipment.

November 1: The performance of investment affects the evaluations of related people, but the exact formula has been confidential. In addition, since the business unit receives compensation upon realized EVA, the low return from the investment must have influenced bonuses.

The decision-making process shows that SCBM has been used in three instances. First, since IRR is 20% and payback period is three years, Kim and Jung assesses the investment valuable. The hurdle rate and the limit of pay-back period are 14% and four years respectively. Second, based on SCBM, financial department monitors the investment and concludes that project does not perform well because it does not meet the annual target. Third, the performance of investment is defined with EVA and compensation is determined.

The three are the application of SCBM in which the meaning of investment is given and pre-determined rules are applied, such as IRR, payback period, performance index for monitoring and EVA.
LL1 Co. case also shows the hint of OCBM, which arises due to uncertainty. The notions of 20% of IRR and three-year payback period are constructed through the processes of information exchange. Kim and Jung provide the information about the types of investment to the related offices such as treasury, control and planning offices in the business unit. The related offices provide their expertise in quantifying the meaning of project. However, such OCBM element is weak, and SCBM prevails in this case. The decision-making process of LL1 Co. is based on a guideline presented in the next page.
Table 23: Part of LL1 Investment Guideline

Requirements
* Annual management plans should include Capex. After Board of Directors (BOD) authorizes it, actual investment occurs.
* Authorization steps for a project: BOD decides important investment, but delegates unimportant ones to Management Committee which is composed of CEO, CFO and other key managers.

Authorization steps by size

<table>
<thead>
<tr>
<th>Investment in equipment</th>
<th>CEO</th>
<th>Management Committee</th>
<th>Board of Directors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within budget</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outside budget</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real estate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less $10m</td>
<td></td>
<td>more $10m</td>
<td></td>
</tr>
<tr>
<td>less $3m</td>
<td></td>
<td>more $3m</td>
<td></td>
</tr>
<tr>
<td>less $5m</td>
<td></td>
<td>more $5m</td>
<td></td>
</tr>
<tr>
<td>Investment in firm: capital contribution in stock (new stock) /capital increase (additional stock)</td>
<td>NA</td>
<td>less than 10% capital stock</td>
<td>More than 10% capital stock or over $10m in other subsidiaries</td>
</tr>
</tbody>
</table>

Evaluation criteria: In principle, investments with IRR less than Hurdle Rate (14%) should be rejected.

<table>
<thead>
<tr>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>New investment</td>
</tr>
<tr>
<td>Extension investment</td>
</tr>
<tr>
<td>Capital contribution in new firm</td>
</tr>
<tr>
<td>Capital increase in existing firm</td>
</tr>
</tbody>
</table>
The investment guideline of LL1 Co. confirms SCBM such that hurdle rate, pre-specified payback period and profit requirement become the criteria to determine the meaning of a project when IRR, payback period and cash flows are known. One may wonder how those numbers are known or estimated, but the question is not within the scope of SCBM, but that of OCBM.

As another insinuation of OCBM, the guideline of LL1 classifies investments with the types of strategy and the sizes. The types of strategy are either business strategies (e.g. investment in equipment) or corporate strategies (e.g. equity acquiring on other firms).
<table>
<thead>
<tr>
<th>OCBM</th>
<th>Observation</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal</td>
<td>Maximize benefit minus cost under large discount rate</td>
<td>Explicit guideline. Payback method and time-to-breakeven</td>
</tr>
<tr>
<td>Valuation</td>
<td>Payback method, time to breakeven</td>
<td>Formula in guideline, monitoring by control/ finance offices, formula</td>
</tr>
<tr>
<td>strategy</td>
<td></td>
<td>varies depending on size and type of investment</td>
</tr>
<tr>
<td>Investment</td>
<td>Include both financial and capital expenditure such as equity investment in</td>
<td>Any employee can suggest investment. Depending on size, management</td>
</tr>
<tr>
<td>opp.</td>
<td>other firms, equipment purchase, etc.</td>
<td>committee and board of directors intervene.</td>
</tr>
<tr>
<td>Internal</td>
<td>Inclusion in annual or special budget. Top managers have discretion to</td>
<td>Corporate office and top managers</td>
</tr>
<tr>
<td>resource</td>
<td>allocate small amount of internal fund.</td>
<td>discuss allocation while they</td>
</tr>
<tr>
<td>allocation</td>
<td></td>
<td>determine annual or special budgets.</td>
</tr>
<tr>
<td>Net accuracy</td>
<td>The capability to conduct accurate valuation varies significantly across</td>
<td>Finance office assists employees to conduct valuation. Format is</td>
</tr>
<tr>
<td></td>
<td>divisions and employees.</td>
<td>important.</td>
</tr>
<tr>
<td>Controversy</td>
<td>Not much controversy exists during budgeting although the total amount of</td>
<td>Ex-ante coordination by control and finance offices. Top managers discuss</td>
</tr>
<tr>
<td></td>
<td>proposed investment may not be same to the acceptable amount of annual</td>
<td>allocation while they determine budget. The firm has clear idea what</td>
</tr>
<tr>
<td></td>
<td>budget. More controversy in large investment exists.</td>
<td>projects have priorities. More communication exists for large investment.</td>
</tr>
<tr>
<td>Uncertainty</td>
<td>Not much uncertainty exists because this case deals with very standard</td>
<td>Employees usually have enough information to apply standard valuation</td>
</tr>
<tr>
<td></td>
<td>investments only.</td>
<td>models. Finance office assists employees to conduct valuation.</td>
</tr>
</tbody>
</table>
LL2 Co.

LL2 Co. case also illustrates the evaluation of regular projects in the absence of uncertainty and controversy. LL2 Co is a trading company. The following investment guideline table describes SCBM.
### Table 25: Part of LL2 Investment Guideline

<table>
<thead>
<tr>
<th>Step</th>
<th>Activities and teams in charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment request</td>
<td>Every employee or team can propose</td>
</tr>
<tr>
<td>IC discussion</td>
<td>Chief of business unit reports a proposal to IC. In order to facilitate the discussion, production team/staff address administrative issues; sales team prepares market analysis and sales plan; R&amp;D prepares development roadmap; business planning team aggregates the collected information and analyze</td>
</tr>
<tr>
<td>Report</td>
<td>Report the recommendation of IC to first authorizer. The first authorizer accepts or rejects it. Once accepted, the proposal follows authorization sequences.</td>
</tr>
<tr>
<td>Authorization</td>
<td>The final approver orders business planning departments to raise or request fund</td>
</tr>
<tr>
<td>Funding</td>
<td>Business planning department ask final/delegated authorizer to approve funding plans</td>
</tr>
<tr>
<td>Budgeting</td>
<td>Once authorized, staff or proposal team makes budget request to final/delegated authorizer</td>
</tr>
<tr>
<td>Investing/purchasing</td>
<td>Once authorized, the team which requested budget submit purchase request to sourcing department</td>
</tr>
</tbody>
</table>

#### Small/unimportant single investment

* Criteria: less than $1 million, usually extension/ modification requests
* No need to discuss the proposal in IC

<table>
<thead>
<tr>
<th>Step</th>
<th>Activities and teams in charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Request</td>
<td>Every employee or team can propose</td>
</tr>
<tr>
<td>Valuation</td>
<td>Business planning department performs cost/benefit analysis and qualitative review</td>
</tr>
<tr>
<td>Report</td>
<td>Report the recommendation of IC to first authorizer. The first authorizer accepts or rejects it. Once accepted, the proposal follows authorization sequences.</td>
</tr>
<tr>
<td>Authorization</td>
<td>Proposal team asks authorization. The review results of business planning dept are attached</td>
</tr>
<tr>
<td>Budgeting</td>
<td>Once authorized, staff or proposal team makes budget request to final/delegated authorizer</td>
</tr>
<tr>
<td>Investing/purchasing</td>
<td>Once authorized, the team which requested budget submit purchase request to sourcing department</td>
</tr>
</tbody>
</table>

Budgeting authorization: < $5,000 is by functional mgr; < $0.1m is by Product mgr; < $0.3m is by Business unit chief; > $0.3m is by Subsidiary CEO. The cheap of business unit can authorize urgent investment.
Refer to the part for small and minor investment (under $1m/modification/extension), which is closer to SCBM. LL2 Co uses both NPV and IRR for cost/benefit analysis. Pay-back period is also used in most cases although it is not required.

In contrast, the part for larger and important investment represents OCBM because it implies higher level of relatedness. In the table, investment should discuss the projects before approval process starts.

From authorization, funding, and budgeting to purchase, other departments intervene to make the investment occur. The organization also monitors and consults the investments.
Table 26: LL2 and OCBM

<table>
<thead>
<tr>
<th>OCBM</th>
<th>Observation</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal</td>
<td>Maximize the return from investment</td>
<td>NPV, IRR</td>
</tr>
<tr>
<td>Valuation strategy</td>
<td>Formula</td>
<td>NPV, IRR, payback method. Formula varies upon the size of investment.</td>
</tr>
<tr>
<td>Investment opp.</td>
<td>Any source</td>
<td>Any employee can suggest investment. Depending on size, investment committee and board of directors intervene.</td>
</tr>
<tr>
<td>Internal resource allocation</td>
<td>Inclusion in annual or special budget. Top managers have discretion to allocate small amount of internal fund.</td>
<td>Corporate office and top managers discuss allocation while they determine annual or special budgets.</td>
</tr>
<tr>
<td>Net accuracy</td>
<td>The capability to conduct accurate valuation varies significantly across divisions and employees.</td>
<td>Finance office assists employees to conduct valuation. Format is important.</td>
</tr>
<tr>
<td>Controversy</td>
<td>Not much controversy exists during budgeting although the total amount of proposed investment may not be same to the acceptable amount of annual budget. More controversy in large investment exists.</td>
<td>Ex-ante coordination by control and finance offices. Top managers discuss allocation while they determine budget. The firm has clear idea what projects have priorities. More communication in the organization for large investment exists.</td>
</tr>
<tr>
<td>Uncertainty</td>
<td>Not much uncertainty exists because this case deals with very standard investments only.</td>
<td>Employees usually have enough information to apply standard valuation models. Finance office assists employees to conduct valuation.</td>
</tr>
</tbody>
</table>
APPENDIX 2: Open-ended interview items

Fieldwork questions relate model and hypothesis to qualitative data. I generate fieldwork questions in an iterative manner. First, I construct a hypothetical process of internal capital allocation (ICA). The hypothetical process is based on the frameworks suggested in finance and economics literature and the pilot studies performed in 2004. Finance and economic research proposes stylized processes of capital budgeting and ICA, especially in capital-budgeting theories and contract theory literature. Bower (1970) has been helpful. Second, the hypothetical process helps generate fieldwork questions and structure field research outputs. Third, while performing fieldwork, I have updated the hypothetical ICA process and the questions.

The iterative process is just an application of the Wheel of Science -- the cycle of deduction in which theories generate hypotheses, hypotheses are tested with observation and induction in which observations result in empirical generalization and the generalization leads to theorization. Broad questions and theories start the cycle in my field study, and they are elaborated over the course of iteration.

This method is similar to the approach of Allison (1971, 1999). In his famous case study of the Cuban Missile Crisis, Allison asks four broad questions and describes the events. The questions were: Why did the Soviet Union place strategic offensive missiles in Cuba? Why did the United States respond with a naval quarantine of Soviet shipments to Cuba?
Why were the missiles withdrawn? What are the lessons of the missile crisis? Allison posits three organization theories: Rational Actor, Organizational Behavior, and Governmental Politics Models. He compares the three theories through the course of events and asserts the inefficacy of Rational and Game Theoretic models. His study provides good interpretations of the situation and highlights the limitations of the three models.

Given both the descriptive and exploratory nature of this field study, I need to start with a broad framework and questions in order to let the data speak. Therefore, the initial set of questions evolves into the discoveries for detailed and interesting sub-questions and issues in fields.

First, this case study is descriptive. Existing theories focus on the output of ICM such as winner picking, socialism, inefficiencies, relation to firm value instead of ICM itself and its ramifications such as the structure, functioning, organization,. I can observe whether the hypothesized ICM in literature is reliable.

Second, this case is explanatory. I compare the observation with existing theories in psychology, organization and strategies as well as in the finance and economics literature. In addition, I explore whether the key issues in ICM are sufficiently addressed. This study identifies the key issues that have been overlooked in the literature and suggests solutions or desired approaches. The solution is OCBM.
Below I list the semi-structured interview questions. First, I list general interview questions, which I asked to all informants. Second, I list the questions customized to each subject of case studies.

General Interview Question

- Describe investment decision process with specific examples: People, hierarchy and time line
- What are the contexts of the investment? Describe both internal and external contexts (controversy and uncertainty)
- How do capital budgeting processes address the controversy and uncertainty? Is SCBM effective in doing so?
- What criteria are used to assess the attractiveness of investments? What is the most important among them? Describe each criterion in detail.
- Describe the division of labor in capital budgeting

Specific questions to an Internet firm
One of the biggest differences between internal capital market (ICM) and external capital market (ECM) is in their incentives. On the one hand, a price mechanism provides incentives to ECM participants. On the other hand, ICM participants receive the compensation via the incentive system designed by the firms. As the functioning of price mechanism determines the structure of ECM, the design of incentive system should affect various aspects of ICM. This case describes such incentive systems. Below are the initial broad questions. (I remove 'what is' in front of each phrase to reduce redundancy.)

- Overview
- Relation to corporate objectives and strategies
- Task classification
- Evaluation system and process
- Evaluation items and criteria
- Usage of evaluation results
- Compensation system and process for both monetary and non-monetary rewards
- Pay increase process
- Timeline
Specific questions to a trading firm

This case focuses on organizational process to generate new business ideas and to integrate successful businesses into an organization.

- ways to generate ideas
- Key components of a successful new business
- Organization and systems to review ideas
- Proposal process and format
- Execution process
- Integration of new businesses into organization
- Organizations and systems to administer new businesses more effectively:
  - teams, structure and hierarchies, role and responsibilities
- The method and process to assess the attractiveness of new businesses
- Review and authorization process
- Incentive system
- Risk management system
- Organizational learning process
• Management of internal funds assigned for new businesses

Specific question to a corporate headquarters

This case focuses on the interaction among groups and the role of corporate objectives during capital budgeting process.

• Vision of capital budgeting process
• Generation of targets of investments
• Process flow charts
• Steps in each process, issues and document formats
• Timeline
• Interactions during the budgeting process and charts
• The role of corporate visions

Specific questions to a wireless operator

This case investigates the financial valuation process while the subject considers corporate diversification.
• The rationale of diversification

• Valuation process for new businesses

• Application process of valuation techniques

• Risk analysis process

• Issues in risk analysis

Specific questions to a telecommunication device operator

This case deals with routine budgeting covering small amount of expenses. Small budgets, while not intensively monitored by central offices, are important for teams. This process reveals power relations in an organization.

• Budget categories

• Operational budgeting

• Investment budgeting
  ○ Proposal
  ○ Execution and Control
  ○ Post investment
• Delegated authorization for less important investment

• Risk management

Specific questions to a heavy industrial firm

This case details the process through which an idea acquires agreement and becomes a serious investment opportunity.

• How to categorize investment

• Teams and their roles

• Planning process

• Review process

• Review criteria

• Authorization process

• Execution process

• Progress management

• Post-investment process

• Investment consultation committee
Specific questions to a financial firm

This case investigates internal capital allocation process in a financial institution.

- Planning
- Allocation
- Monitoring
- Evaluation and learning
- Barriers to ICM
- Risk consideration

The questions to other subjects overlap with those on the list above. Data sources are as follows.
<table>
<thead>
<tr>
<th>Type</th>
<th>Source</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal documents</td>
<td>Budget requests, business plan, spreadsheets, investment guidelines, and unofficial meeting memos</td>
<td>Hard/ codified information</td>
</tr>
<tr>
<td>Semi-structured interviews</td>
<td>Professional acquaintances, personal acquaintances, the alumni of two top business schools in North Carolina and New Hampshire, and those whom the former contacts have introduced; Those in the central strategy offices of the Chaebols are important informants; No audio taping to elicit honest answers and confidentiality</td>
<td>Soft/ tacit information; crosscheck between interviewers; interview guide of Huber and Power (1985) and Yin (1985)</td>
</tr>
<tr>
<td>Media articles</td>
<td>Articles from Bloomberg and local news portals about the contexts of investments such as uncertainties, growth rates, shareholder reactions, government, labor union, top management comments, organizational changes, legal issues, etc.</td>
<td>Contexts and consequences of decision-making</td>
</tr>
</tbody>
</table>
APPENDIX3: Methodology and Flow

Ethnography, comparison and contextualization constitute the anthropological triangle upon which I ground my research. Ethnographic triangle defines the method to write ethnography from ethnographic data (Barnard & Spencer, 1996). In addition, I try to be dialectic in order to relate new theory with data by iterating deductive and inductive logic. This iteration makes my research both normative and descriptive.

I start with the deductive logic upon the existing theories about capital budgeting. I compare their predictions with well-known empirical findings. This reveals the inconsistencies between theories and observations, which I call empirical irregularities. Second, I hypothesize that the empirical irregularities exist as a blank in the theoretical structure of existing capital budgeting models. I confirm the theoretical lacuna by using alternative theoretical perspectives. Third, as an induction, the empirical irregularities and conjectured theoretical weakness become the basis of new theorizing about capital budgeting. Fourth, the new theory generates distinct predictions from old theories through deductive reasoning. Fifth, I conduct ethnography. The ethnographic data is compared and contextualized upon the new theory. Sixth, I update the theory through inductive reasoning. Finally, I iterate the process.

This is a dialectic process similar to grounded theory (Glaser & Strauss 1967; Strauss & Corbin, 1990) and its variations such as Eisenhardt (1989) and Eisenhardt and
Graebner (2007). I caution against interpreting the limitations and critiques about my methods as those about the grounded theory and its variant methods. The next section explains each step of my method.

Analysis of lacuna in financial models

My research begins with analyzing the disruptions of the existing framework, i.e. Standard capital budgeting model (SCBM). SCBM has been both normative and descriptive framework for capital budgeting practices. SCBM is based on financial and economic reasoning. My analysis about SCBM is two-folded. First, I propose that SCBM has its limits in explaining observed capital budgeting practices. When SCBM tries to explain practices, it requires disregarding deviations as uneducated or insignificant routines. In contrast, I argue they are integral parts of capital budgeting. Second, SCBM exhibits the logical lacuna at theoretical level. While capital budgeting is an organizational phenomenon in internal capital market, SCBM has not incorporated organization theories or modeled organizational contexts. The two arguments are associated with each other. The empirical irregularities appear as the lacuna in theoretical space. In turn, the irregularities realize the theoretical weakness. This empirical and theoretical matter constitutes my research question and requires a new solution.
Construction of OCBM

In response to the issues identified in the first step, I propose a solution at the theoretical level instead of ignoring or reclassifying observed capital budgeting practices into the existing frameworks arbitrarily. Organizational Capital Budgeting Model (OCBM) is my proposal. First, in order to address the theoretical lacuna of SCBM, I try to fill it with organization theories. Capital budgeting takes place in internal capital market, which is an organization. Thus, I conjecture capital budgeting theory should be embedded in broader organization literature. Second, as for empirical irregularities, I trace what underlying variables may influence the extent of empirical irregularities. I summarize the identified variables into one internal and one external variables of organization: controversy and uncertainty. The uncertainty is qualitative and nonnumeric risk (Keynes 1921; Knight 1921). Since the two variables have been important in organization theories and sociology, they fit my plan of introducing organization theories into capital budgeting in order to build OCBM.

Ethnography

This thesis places much emphasis on detailed descriptions. While SCBM has limitations, this does not render OCBM valid. I select ethnography as empirical strategy.
Ethnography is useful to review theories including OCBM and to complete theorizing OCBM. Several reasons exist. First, existing theories lack the space to incorporate field data which arises as chunks of diverse and entangled information. It is a serious limitation because the empirical irregularities against SCBM are often episodic. (See Appendix.)

Second, the deviations from NPV, the representative SCBM, are understood as the phenomenon marginal, wrong, exhibiting lack of understanding, confined to small firms, occurring among uneducated managers, . (Brealey et al., 2005; Graham & Harvey, 2002). The phenomenon may not be marginal. Instead, I conjecture the deviations are the important phenomenon of applying capital budgeting techniques judiciously and appear more often when capital budgeting becomes more significant activities. To trace such conjecture, ethnography is the proper option.

Third, detail-oriented qualitative studies contrast highly general financial frameworks. Thus, the discovered particularities can be the basis of new models to overcome traditional financial models. Quantitative methods have limitations in revealing the hidden motives and assumptions of managers when they conduct capital budgeting.

Fourth, I propose that the use of qualitative studies has relation with the progresses and regresses of firm theory. As discussed, capital budgeting occupies an
important position in firm theory. Firm theory has not developed in a smooth and cumulative way. Instead it experiences abrupt development, periods of retrogress and resuscitation. I argue that the use of qualitative studies can partially explain the dynamic history of firm theory. The detailed argument about the history of firm theory will be provided upon request.

Since the comparison with theories is an important objective of ethnography, it is important to provide unbiased description of practices and to reveal the limitations of theories even including OCBM. The extents of revealed limitations in theories tell whether ethnographic data just confirm theories, fill in the blanks in theories or becomes foundations to produce new theories. In my case, ethnography reveals and fills in the blanks in OCBM, and becomes the foundation to overcome SCBM, positioning OCBM as a generalization of SCBM.

**Contextualization**

OCBM helps me to interpret and abstract the ethnographic data in the context of the data. In addition, the data reveals certain problems of OCBM and allows me to rebuild OCBM. This process improves the persuasiveness of my research. This technique of contextualization instructs how to advance OCBM, how to achieve fundamental shift from SCBM and how to suggest OCBM as a significant generalization of SCBM using
ethnographic methodology. Thus, this process produces the refined version of OCBM and prescriptive arguments. Further development occurs in the subsequent iteration processes.

Iteration

I develop OCBM in the belief that it offers useful references to understand practices. The ethnography challenges the original OCBM with novel findings. I interpret the challenges as the request for the flexible theoretical structure instead of the outright failures in OCBM and SCBM. This iterative theorizing process enriches OCBM by introducing new variables such as communication, research and the new concepts such as exploration. The upgraded OCBM not only explains the ethnography better, but also suggests the possibility of application beyond the ethnographic data. I suggest that such challenges may occur in other research. Thus my experience of theorizing for flexible structure can be useful to the researchers.

Practitioners are publishing more than ever about their thoughts and experiences. Conflicts among those accounts are abundant. I suggest the possibility and potential of comprehensive frameworks to resolve such conflicting intuitions and experiences from fields. Thus, the theorization through qualitative study will remain
essential in the research for internal capital market. The illustration below depicts the analysis of capital budgeting.

Figure 3: Methods and Flow
References


Black, F., Scholes, M. The pricing of options and corporate liabilities. *Journal of


Maritan C.A. Capital investment as investing in organizational capabilities: an empirically grounded process model. *Academy of Management Journal* 44 (3): 513 -


Biography

Hyoung Goo Kang is an assistant professor in Ewha Womans University in Seoul, Korea from February 2009. He completed PhD at The Fuqua School of Business at Duke University, MA at the economics department in University of Virginia while he was an economics PhD student, and BA at the economics department in Seoul National University. He worked as a quantitative analyst/strategist at Lehman Brothers Asia Headquarters (2006 to 2008, Tokyo), a strategy consultant at Accenture Seoul office (1998 to 2001), and a lieutenant at Republic of Korea Air Force (1995 to 1998). He has short-term experiences in International Monetary Fund (summer 2003, Washington, D. C.) and Samsung Investment Trust Management Co. (summer 2005, Seoul).