
MAKING SENSE OF REAL OPTIONS REASONING: AN ENGINE OF CHOICE THAT BACKFIRES?

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INTRODUCTION

DECISION makers have long sought ways to effectively yet efficiently generate strategic flexibility within their organizations so that they can quickly adapt to dynamic market conditions (e.g., Ashby 1956). Not surprisingly, decision makers have taken notice of claims that, through real options reasoning, one can design an organization to function as an “engine of choice” (McGrath et al. 2004: 86) that generates unending chains of strategic decision-making opportunities while at the same time limiting the associated costs (Bowman and Hurry 1993). Is real options reasoning actually able to fulfill this promise?

This chapter traces the development of real options reasoning (ROR) and details how problems in assessing the value of real options have made ROR difficult to implement. The chapter then describes how in practice, instead of focusing on explicit valuation, organizations use analogous reasoning to develop, select, and implement options that enable strategic flexibility and so enhance value. An illustrative case demonstrates how financial options can help this process by buffering core operations from changing market environments. The same illustration also shows that ROR fails to simultaneously create future choices while limiting costs. Moreover, where it does generate future choices, it does not prevent decision makers from making poor choices. Thus, the engine of choice that ROR suggests organizations should create may in fact backfire on those decision makers who try to implement it.

THE DEVELOPMENT OF REAL OPTIONS REASONING

An option is simply a decision-making opportunity. The finance field formalized an option as a rights contract that transfers market risk; that is, a financial option is the legal right but not the obligation to buy or sell a market asset at a predetermined rate for a prespecified time. By paying an option premium, a buyer buys the rights to any market gains during the option period; by accepting the option premium, a seller agrees to absorb market losses during the same period. A firm may decide, for example, to purchase a financial option to buy a million gallons of oil at US\$3 per gallon six months from now. If market prices move above US\$3 in the next six months, the firm exercises its option and obtains the million gallons from the option issuer who must absorb the difference between the market price and the US\$3 the firm contracted to pay. If prices fall below US\$3, the firm buys oil on the open market at less than the contracted amount and abandons its option. From the firm's standpoint, the cost of the option allows the transfer of market risk, after which a firm makes only value enhancing decisions.

Myers (1977) suggested that capital investment projects generate decision-making opportunities similar to financial options. An initial investment that gets a project started, for example, is akin to the premium paid to acquire a financial option. As projects then unfold over time, managers can decide to abandon, defer, expand, or contract them, or they can make new investments in unplanned directions. Each of these possibilities is a decision-making "option." Both "real" and financial options offer these time related decision-making opportunities and so in this sense, they are similar in how they enable strategic flexibility. Real options differ from financial options, however, in how decision makers determine their value. The value of a *real*

option directly relates to the value of the associated, ongoing project. This value requires subjective assessment and changes as a project progresses. The value of a *financial* option, in contrast, depends on the market value of a particular asset and on the contractual rights that buyers and sellers agreed to when they transferred the risk associated with this market asset (Myers 1977). Hence, the value of a real option always involves a subjectively determined estimate, while the value of a financial option always reflects a market determined price.

Option traders use the Black-Scholes formula to determine the value of financial options. The formula uses several parameters: a stock price, an exercise price, a time to option expiration, a measure of the volatility underlying the optioned asset's value, and the risk-free interest rate. All of these parameters have current market values, and so the values the formula generates directly reflect market conditions. In fact, the formula establishes a "fair market value" for trading a financial option.

Real option scholars and practitioners have attempted to adapt the Black-Scholes formula to value real options (Brennan and Trigeorgis 2000). To use the Black-Scholes formula to assess real option value, however, one must rely on subjective estimates for the different parameters. An estimate of the project's expected cash flows can substitute for the stock price. Equivalent to the option exercise price, one can estimate the cost of the next project stage. The equivalent of the option expiration date must reflect local circumstances. While competitive pre-emption might suddenly end an option's viability, for example, struggles between optimistic project champions and skeptical upper management might extend its life. To estimate volatility, one should assume that the project's risk profile is similar to the same industry's stocks as they trade on a large financial market. Decision makers must also make adjustments to the risk-free interest rate to account for specific project risk (Fernandez 2002). Bowman and Moskowitz (2001) show that although one could insert such subjective estimates into the Black-Scholes formula, this will necessarily lead to unstable and controversial estimates of what the real option value may be. Ultimately, the approach is practically infeasible because of the unreliability of combining so many subjective estimates.

Consistent with this state of affairs, scholars rarely advise and managers rarely attempt to assign explicit values to real options (Miller and Arikan 2004). Rather, ROR is intended to be primarily a heuristic. Yet even in this regard, ROR research remains vague in terms of what decision-makers should actually do (Adner and Levinthal 2004). Instead of spelling out implementation methods, researchers offer vague analogies. Kogut and Kulatilaka (2001: 756), for example, suggest: "An options approach indicates that firms construct exploratory ridges between peaks to hedge against adverse changes in the landscape." Luehrman (1998: 90) says, "Managing a portfolio of strategic options is like growing a garden of tomatoes in an unpredictable climate." But how should a decision maker decide which exploratory ridges to construct, or which tomatoes to grow?

ROR ignores the value assessment issue and focuses on how time dependent decision making can facilitate organizational flexibility. Kogut (1991), for example,

notes how the intention in joint ventures to create time related flexibility is consistent with real options thinking. Finance scholars such as Trigeorgis (1996: ch. 8) and Luehrman (1998) think of "strategic flexibility" and "real options thinking" as essentially synonymous. The common intuition is that, "when the future is highly uncertain, it pays to have a broad range of options open" (Coy 1999: 118).

ROR can be quite specific in its recommendations, however. ROR views the total of an organization's resources as a bundle of real options and argues that decision makers should manage these options over time. It holds that if small investments can initiate new projects and so option costs are low, then decision makers should initiate many projects (McGrath 1997, 1999). Beyond this overarching logic of creating strategic flexibility by initiating many projects, ROR also deals with the need to efficiently abandon significant numbers of these projects. ROR requires decision makers to assess project performance against targets at pre-specified times (Adner and Levinthal 2004). If a project fails to meet a performance target, ROR requires decision makers to abandon the option and avoid further downside loss (McGrath 1999). Disciplined option abandonment is critical to the success of ROR because it ensures that decision makers avoid escalation of commitment to unpromising options (Barwise et al. 1987; Busby and Pitts 1997). Thus, despite the rhetoric of flexibility that ROR emphasizes, a central aim of ROR is to impose discipline that eliminates significant degrees of flexibility—the flexibility to continue investment in unpromising projects. Yet to make this decision, firm decision makers must assess ongoing option value. How to do this is an unresolved issue.

MAKING DECISIONS ABOUT OPTIONS

How do decision makers actually manage options? Levinthal and Rerup (2006) suggest that decision makers learn from earlier situations, and use analogous reasoning to find ways that these insights may apply to new situations. By comparing earlier and current situations, decision makers often find that they can estimate the costs and the benefits of available options sufficiently enough to make decisions; they have enough information to make a decision in favor of one option or another. Decision makers use similar heuristics to assess how available real options match with the requirements of evolving market environments. Of course, situations never replicate exactly and new issues and options inevitably emerge, but for managers to choose between options, it does not seem that they need exact figures—what they do need is contextual appreciation and believable estimates.

As organizations can repeatedly and successfully replicate similar options in new situations, Winter and Szulanski (2001) suggest that managers develop better option management skills even as their organizations develop unique capabilities.

option at all. Silver took ten years to explore ways to combine his glue that did not stick with other 3M resources and create new product options with market appeal. Eventually, it became the basis of Post-It Notes and a huge raft of new but unimagined, commercially successful 3M products. Analogous reasoning could not be used in this context because most people at 3M Corporation had never conceived of glue that did not stick. A trial and error innovation process was necessary to find possibilities but this took years. Had a relevant analogy been available, it would have greatly speeded up the process.

ROR is intolerant of long exploration processes such as this because in many organizations, real options are replications, development processes are based on analogous reasoning, and so many options are non-exclusive and subject to competitive preemption (Pinches 1998). If other firms can imitate a particular option, they can replicate it and compete profits away (Barney 1986). By waiting before committing to such a project, decision makers risk lockout in the face of early mover competitors (Ghemawat and del Sol 1998). Further, low cost activities intended to create real options like research and development, test marketing, or "low cost probes" (Brown and Eisenhardt 1997) may alert others to new opportunities. This may allow competitors to pre-empt or at least shorten periods when an option is a source of competitive advantage (Barwise et al. 1987). Rather than having an ability to respond to emergent events with time dependent options, a firm may find it is left holding "fool's gold" (Garud et al. 1998) as competitors are in position to exploit the opportunity. A viable foothold sometimes requires a quick investment and full commitment (Schilling 1998) rather than time dependent option flexibility.

ROR has not considered how analogous reasoning and organizational consensus making help decision makers sort out which options to pursue and which to abandon. It is likely that such a process allows decision makers to make quick decisions that take many situational subtleties into account while the same process may overlook new information suggesting new options and new directions. Such processes are areas for further research to determine how the time dependent logics that ROR emphasizes may complement the use of analogous reasoning and organizational consensus making. By developing a more complete understanding of these processes and how they may complement one another, decision makers may be able to better manage how organizations generate, select, and implement their options.

USING OPTIONS IN PRACTICE

Guided by their values and expectations and using analogous reasoning, decision makers develop options for current situations. As most organizational situations contain many resources that can be combined in different ways, many options are

available. Most decision makers don't recognize most of them, however, and this causes them little concern because they know that if they want to, they can easily draw on vast numbers of unexploited degrees of freedom and develop new options (Bowman and Hurry 1993; Dunbar and Starbuck 2006). They also know that if they apply analogous reasoning and discuss their ideas with others, they will also likely uncover new options. As generating real options is not a problem, decision makers focus on building consensus on the actions to be taken from the options available (Brunsson 1985). They allow values, expectations, and the evolving consensus to guide the process that selects some options and eliminates others.

Although decision makers usually know what ideally they would value, they often have only a vague idea about what options might achieve these outcomes. Discussion often centers not so much on what option to choose but on how to implement it and as a result of talking about it, options get modified in the process of implementation. In this sense, an option constitutes a continuing experiment and decision makers are assessing whether option implementation or a modified option may contribute to organizational value creation. Discussions constitute the ongoing experimental process that creates and modifies and then selects and implements a particular option rather than the alternatives. Continuing discussions explore likely option efficacy.

Over time, distinctions emerge between different types of options. Some options involve critically important tasks in the organization's operating core where the aim is to perform tasks in a predictable and stable manner (Thompson 1967). Options at this level support predictability and efficiency. Decision makers often surround an operating core with support units that protect it, or adapt, evolve, and adjust to developing environments. Options to support an operating core respond to changes in the environment, in the core, in decision makers' beliefs and values, etc. In addition, decision makers may consider new options to rejuvenate an organization with, for example, new products, new services, new facilities, or new capabilities (Burgelman 1983; Dunbar and Starbuck 2006).

OPTIONS SUPPORTING STABILITY IN THE ORGANIZATIONAL OPERATING CORE

After decision makers identify specific tasks and relationships as core operations (Thompson 1967), they train and equip personnel and install rule systems and evaluation criteria to enable repeated and effective task accomplishment. They hone implementation to ensure the operating core is effective and efficient. When an operating core achieves desired efficient performance, decision makers want

options that stabilize it. Thompson (1967) said decision makers should stop exploring options to adjust core value generation processes when they generate performance variation, not performance improvement.

As decision makers use options to minimize performance variation in operating cores, if variation occurs, then unanticipated sources of disturbance are often the cause. Changes in implementation of procedures may cause unexpected variation, for example, or changes outside the operating core may cause variation, e.g., variations in input costs or demand levels. Options to introduce additional quality control routines may eliminate implementation variation (Dean and Bowen 1994). Options to increase training and expertise, and to carry out experiments can increase the reliability of technology (Dixit and Pindyck 1994). Variations in input and outputs to the operating core, however, are often beyond decision makers' control. However, in this situation, financial options can help decision makers. Specifically, a financial option can make supplies of critical inputs available at predetermined prices (e.g., oil). In a similar way, a firm may sell options to dispose of its products at predetermined prices. Financial options reduce the impacts of exogenous sources of variation on core operations.

OPTIONS SUPPORTING ORGANIZATIONAL DEVELOPMENT

Decision makers are concerned not only with core operating units but also with options that help organizations evolve, change, and grow. They may be interested in options that introduce new products and services to increase an organization's size and profits, or options to respond to internal and external issues in ways consistent with organization values. They may also consider options that make an organization a better place to live and work.

To stimulate search for new options, decision makers can proceed in two ways. One approach is to rely on the emergence of problems over time. As problems emerge, decision makers then search for options to solve the problem (Cyert and March 1963). Alternatively, if decision makers introduce new evaluation criteria, this may highlight new options for improvement possibilities. Improvement options come from anywhere within an organization, and so decision makers often invite improvement option ideas from all over an organization. As new definitions of value emerge, organizations seek new options to revise current ways of doing things (Usher 1954).

Given an objective organizational problem or a subjective evaluation criterion for defining organizational improvements, decision makers reconfigure available

assets to find new organizational options. The problem then is to decide which options to pursue and which to eliminate. Discussions often lead to consensus in support of some options and the elimination of others. Another approach is to predetermine evaluation criteria and have a contest between option possibilities, with the organization committing itself to the competition winners while eliminating the rest. If options are in fact all relatively similar replications, a contest to decide which options to pursue and which to abandon may make sense. To avoid controversy, however, decision makers who mobilize multiple options and use contests for selection must have transparent and fair evaluation processes so that the advocates of unselected options do not reject the organization and its processes.

In some cases, new project options are so different or so unique that a competition or a staged investment process is difficult to conceive. In this situation, errors could be costly and decision makers will want to discuss possibilities widely, bringing in more information and using a variety of assessment criteria. The emphasis is on learning about the option and its implications. A staged investment process with disciplined cutoffs threatens this ongoing learning and analysis cycle (Barnett and Cahill 2007). If a decision maker abandons a unique option without the full participation of those seeking to realize the option, the process generates skepticism and alienation, degrading an organization's capability to create new option value (Barnett 2003).

A continuing process of option development to support an adaptive organization implies that decision makers can revise, change, develop, or abandon options. New options often utilize available resources in new ways. New option possibilities may be most likely to emerge from organizational resources and areas that decision makers always knew were available but which they overlooked and did not particularly value (Bowker and Star 2000). Diverse views, broad participation, and evolving evaluation criteria seem to be the essence of continuing option development and abandonment as the process is currently practiced. This contrasts with the focus of ROR that favors financial criteria and fixed decision points at which time decision makers must either exercise or abandon options (Adner and Levinthal 2004).

OPTIONS IN PLAY: AN EXAMPLE

Suppose that a firm produces the top selling doll, Amiable Amber. Ms Amber has been the best selling doll in the United States since she entered an adoring market some 40 years ago. The firm wants to organize to maximize profitability from continuing sales of Ms Amber. Its decision makers want to protect Ms Amber's

production from key uncertainties, such as input price uncertainty and demand uncertainty. Ms Amber's distinctive feature is her amber eyes that are made with a full ounce of authentic high quality amber. The availability of high quality amber varies and, accordingly, so does its cost. Fluctuations in amber availability and price can threaten the ability to produce Ms Amber dolls at a profit.

High volume retailers buy Ms Amber for US\$22. The firm can purchase the amber used in Ms Amber dolls for about US\$5 per ounce, and so each doll contains about US\$10 worth of amber. All other production costs total about US\$10, and so it typically costs about US\$20 to produce a Ms Amber doll. Amber prices fluctuate from US\$4 per ounce to nearly US\$9 per ounce, however. As prices for amber exceed US\$6 per ounce, it becomes unprofitable to produce Ms Amber. In light of this, the firm could use financial options to maintain a steady supply of amber at a price that allows for profitable production. In particular, the firm could seek option contracts that provide it a guaranteed source of amber at no more than, say, US\$5.50 per ounce. If the market price of amber is above US\$5.50 per ounce, the firm exercises the option and buys amber for US\$5.50. If the market price of amber is below US\$5.50, the firm buys it on the open market. The use of financial options enables continued production at a preset level of profitability, despite market price fluctuations, and the door remains open to higher profitability. For example, were amber to drop to US\$4 per ounce, the firm would be free to benefit from this drop in price and double its profit margin since the financial option does not require that it purchase amber at US\$5.50. Thus, by holding the financial option, the firm has the opportunity to make only those choices that create the most value for it, given changing external market conditions.

In addition to using financial options to protect against input cost uncertainty, the firm could use real options to protect against demand uncertainty. Perhaps due to a saturated US market, the firm may import Ms Amber into Canada. The firm is not certain, however, of the demand for Ms Amber in Canada. If demand is strong, then its current plant will be unable to produce enough dolls and it will need to build additional capacity quickly. Otherwise, rivals could fill the demand that the firm has proven exists. The fastest way to expand is to build a second assembly line adjacent to the current plant. The plot of land next to the plant is available for lease with an associated right to buy it. For the firm, leasing the plot of land is the equivalent of acquiring a real option that gives it the right but not the obligation to build additional production capacity at a maximally convenient location. If the firm discovers that its dolls are not selling, it will not make further investment in plant capacity. When the lease is up, it will not renew it and by so doing, the firm abandons its option. A happy alternative would be that the firm discovers that its dolls are selling well and it wants to produce more. The firm may then exercise the option, buy the land, and build added plant facilities. With increased doll demand, the option to build additional plant capacity has increased in value and it exercises

its option. Again, the option allows the firm the opportunity to make only those choices that would increase its value, given changing market conditions.

However, dolls have limited lives, no matter how amiable. Even Barbie innovates as times change. Instead of driving a gas-hogging sports car, perhaps Barbie might sell better if she drove a Prius. The doll firm's chief executive officer (CEO) believes his firm would benefit from offering an evolving portfolio of dolls. He particularly likes the idea of taking real people and offering them for sale in a doll form. The worry is just how well these dolls will sell. Before committing to their production, the CEO would like a better sense of the market for these dolls. He has directed his staff to propose new dolls that the firm could market. Current proposals include marketing a President George W. Bush war-president doll and a Laura W. Bush reading-leader doll. For the purposes of this story, imagine that the White House has agreed to allow the firm to produce and sell dolls that have a likeness of the President and his wife. The doll firm could view the test marketing of these new doll concepts as real options. If the market appears promising, the firm would exercise the option and produce the dolls; if not, it will abandon the new doll concept and so losses would be limited to the cost of the test market program.

Imagine, too, that the firm is very aware of prior experiences where it committed to projects that turned out poorly. The firm has had two dolls that generated legendary but contrasting sales experiences. Beyond Amiable Amber, the firm's best sales success was its beloved Jostle Me Elmer doll that flew off shop shelves for years. The firm's big disappointment was the Ken Lay Ethics Action Figure doll that never took off, even as Enron was one of the world's most admired companies. The losses associated with the full scale launch of the Ken Lay doll eclipsed the profits generated by Jostle Me Elmer. Were it not for the continued success of Ms Amber, the firm would have been bankrupt. Bearing these experiences in mind, the firm wishes to avoid full launches of new product lines until it is sure of adequate market demand. On the other hand, the firm also wants to be able to produce the extra dolls if demand materializes. If the new dolls prove to be a success, the firm will not have enough production capacity.

The value of holding a lease on the land next to the current doll factory increases as uncertainty about the number of dolls the manufacturer will sell increases. If doll sales could vary from ten to ten million units per year, the lease that secures the firm's ability to expand capacity, without obligation, is more valuable than if dolls sales vary from 10,000 to 100,000 units per year. In effect, only the upside matters where option value depends on the exogenous factors that determine doll demand. The downside becomes irrelevant, since additional capacity is not built. The lease allows the firm to "wait and see" what the future holds, delaying any commitment to the large capital project that building new plant facilities will entail.

However, the options of developing new dolls are in many ways replications. The key issue is which doll will have that "X" factor that attracts a market. The firm may be certain there is demand for a doll that exudes ethics but may be uncertain about

its ability to produce a doll with the necessary "X" factor. The firm may commission several teams to work independently to make, say, an Ethical Elmer equivalent and so "spread its bets." The firm may fund each team to develop but not produce a doll. This minimizes firm costs until sales efficacy is determined. If the decision maker sets the situation up in this way, the firm holds several "wait and see" options and it can discuss which ones it should proceed with or organize a contest and pick the best.

Decision makers may also seek to influence demand. The doll manufacturer might test market its dolls, for example, to learn about current market demand. The meaning of the time flexibility that the firm's option affords moves from "wait and see" to "act and see." Further exemplifying an act and see stance, decision makers may realize they could add functionalities to the dolls that might appeal to consumers and broaden the potential market. For example, the presidential dolls might say things typical of the president and his wife. This programming could also be flexible, with the dolls saying different things with more appeal in different markets. Yet as the firm has not included such functionality in dolls before, there will be questions as to whether it has the capability to do so.

An additional option is to push established product lines in new directions. Apart from minor changes in the quality of materials, Ms Amber has been the same basic doll since she was first introduced 40 years ago. At the annual toy convention, a Ms Amber fan told the chief executive that she would like to use Ms Amber to learn how to put on makeup properly. With the market evolving toward dolls with greater functionality such as Sewing Sue and Marching Martha, the chief executive took this suggestion seriously. Further, he believes that a doll that helps children to learn critical life skills and respect social models is consistent with the theme he seeks to establish with the President and Mrs Bush dolls. He wonders, though, if it is feasible to make Ms Amber interactive, such that she would display certain facial expressions and voice positive or negative reactions as children apply her makeup correctly or incorrectly.

As always, there are severe cost pressures in this industry and every option to change a doll introduces additional costs. Uncertainty surrounds whether consumers will see the new additions as valuable, whether the firm can make the changes, and whether it can charge sufficiently to recover its costs. This opens many new and interrelated option complexities that ideally the firm will explore and understand. New options also risk disrupting currently well established plant routines.

Without a lot of effort, our doll manufacturer is getting too many good option ideas. Doll demand is certain and it has the technology to produce dolls but should it be meddling with its manufacturing processes? And which new dolls should it bet on? It's difficult to engage in a low cost probe to determine which low cost probe to pick and if you have done so, which option has value and which do you cut off?

ROR is not able to supplant managerial reasoning in decisions to create or destroy organizational value.

CONCLUSION

Decision makers make choices to generate organizational value from available options. They create options by using the unutilized degrees of freedom surrounding organizational assets. Until they combine organizational assets to form a real option—a specific project in a particular organizational context—the value implicit in combinable organizational assets is unknown. Decision makers know option development requires input from many diverse sources and they repeatedly experiment to find which options are effective. When sources of uncertainty are organizationally endogenous, objective data is not available and so evaluation must be subjective. Decision makers must rely on their experience. Past experience involves the implications of related replications and discussions with knowledgeable colleagues. The decision maker's aim is to develop expectations concerning how long it will take to develop an option and what to expect as a result. Through this process, decision makers initiate and abandon options.

The perspective of decision makers using their experience to develop, choose, and evaluate available options contrasts with the perspective of ROR advocates who assume that options are givens and that option selection involves evaluation routines and the use of time flexibility. For ROR advocates, uncertainty and unpredictability over time require authoritative intervention. They justify their view because some decision makers escalate commitment to costly options that they should abandon. The aim of ROR is to develop a simultaneous solution to the problem of uncertainty and the potential of decision makers to escalate their commitment to expensive options. Their real options solution is claimed to enable an option holder to remain exposed to the upside potential inherent in uncertain and unfolding events but be protected from downside risk. They believe they achieve this aim by waiting for uncertainty to resolve and then at a certain point in time, either exercising the option to gain the upside benefits that have become certain, or abandoning the option as downside losses have also become certain. This reasoning makes it difficult to manage options because the objective data one needs to make decisions about benefits and losses is lacking (Busby and Pitts 1997; Bowman and Moskowitz 2001; Barnett 2003; Adner and Levinthal 2004).

The ROR literature claims the approach is revolutionary because it characterizes an organization as consisting of bundles of options that increase performance uncertainty and variation and contrasts this with the conventional view that

decision makers should avoid uncertainty and minimize variance. Specifically, ROR suggests decision makers can embrace uncertainty by pursuing a large number of options and diversifying widely. If a decision maker pursues many options and a few succeed, on balance the decision maker may minimize performance variance (March and Simon 1958; Thompson 1967; Pfeffer and Salancik 1978). On the other hand, this approach makes a relatively simple ongoing problem unnecessarily complicated. Rather than treat all organizational assets as an evolving bundle of options always in play, for example, it seems simpler and more effective to generate options in a one-at-a-time fashion as a way to avoid or embrace uncertainty one step at a time. Moreover, this seems to be how decision makers actually manage options.

ROR is a heuristic that forces a consideration of a bigger field of options but then enforces decisions at time point while ignoring value that it needs to assess but cannot assess. This time-based rigidity destroys the flexibility that is necessary to generate organizational value. The traditional discussion method that decision makers use takes options one at a time and makes a local assessment. This leads to a narrower picture but decision makers face issues of assessing value rather than ignoring them. After examining how decision makers pursue the creation of strategic flexibility in their organizations, and comparing practice against the prescriptions of ROR, it is not clear that ROR improves the decision making process. Rather, it seems that it can make the process worse, at least in comparison with how decision makers usually manage their options.

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