Strategic Outsourcing - A Real Option Approach

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Abstract

Rationales for outsourcing have been well debated both in the practitioner and the academic arenas. Different rationales put forward over the years can be broadly put into two categories. The value rationale encompasses a host of theories particularly from strategic literature which is broadly based around the view that a firm creates value for itself on the basis of its inimitable resources, skills and core competencies. The outsourcing rationale embedded in these theories is that the non-value creating activities are a suitable candidate for outsourcing. The cost rationale is primarily based on theories of transaction cost, transaction cost economics and new institutional economics. The broad view here is that the make or buy decision of the firm is a function of the transaction cost a firm incurs to use the price mechanism. If the cost of using the market is lower than the cost of producing the goods and services in-house, the firm opts to buy them from the market otherwise makes them in-house and thus establish the boundaries of the firm. Both the rationales have been criticized for being positive or descriptive rather than being normative in relation to the outsourcing decision.

None of the rationales directly address the issue of uncertainty in an outsourcing decision, yet uncertainty is inherent and firms deal with it whenever they embark on outsourcing. The degree of the uncertainty varies from case to case and is primarily a function of the transaction costs of an outsourcing relationship. Transaction costs are the costs of monitoring and costs of enforcement of the contract in case of non performance by the external service provider. The transaction costs are hard to measure Ex. ante and become increasingly measurable with the passage of time during the duration of the outsourcing contract.

A firm deciding to outsource certain transactions holds a real call option (the right but not the obligation) on producing those activities in-house at a future date. Maintenance of a strategic capability in relation to the outsourced activities within the firm makes this a true real option. By mapping an outsourcing decision onto a real option, firms are cognizant of the inherent uncertainty in an explicit fashion and can think of ways to manage it. I argue that in outsourcing transactions, where uncertainty is high, the firms can benefit by adopting a real option approach to operationalise the outsourcing decision. One example of this will be offshore outsourcing where uncertainty is likely to be greater than the traditional onshore outsourcing model, because of the different institutional setting of the external service provider vis a vis the firm. I argue that this added dimension of uncertainty management makes the outsourcing rationales of value and cost more normative.
Introduction

The academic literature provides explicitly or implicitly several rationales for outsourcing. It is however not clear that the practitioner community looks at these rationales as practical tools for conceptualizing an outsourcing decision. This is perhaps because though these rationales emerging out of different academic streams of economics and management are elegant and coherent, they do not act as normative tools for managers. In this study, I explore the various rationales for outsourcing as it exists in the academic literature and ask the question why these rationales often fail to act as a toolbox for managers looking to engage in the outsourcing process. I argue that the existing theories do not adequately address the issue of uncertainty in an outsourcing process, which is the main reason they fail to act as normative theories. I suggest that by adopting a real option approach, firms can directly address the issue of uncertainty thereby making the rationales of value and cost more normative.

It is useful to start by providing responses to a few fundamental questions about outsourcing. The benefit of this is twofold. First, it articulates the position of this research in relation to some of the terminologies used in the study. This is important as there does not exist a common understanding of these terminologies within the academic and practitioner community. Second, it sets the stage for the research issues of this paper.

What is outsourcing? Casual empiricism suggests that the business and academic literature views outsourcing in different ways. A firm does not carry out all the activities it needs to produce the goods and services. It procures goods and services from its supply chain. This ‘buy’ decision is sometimes referred to as outsourcing. Other literature takes an evolutionary view of outsourcing and relates to cases where firms produce certain goods/ and services in-house and then for a variety of reasons, stop producing and procure them from the market. This study relates to the latter i.e. it concerns itself with the issues of outsourcing which can be viewed as a form of predetermined external provision with another enterprise for the delivery of goods and
services that would have been earlier offered in-house (Kakabadse and Kakabadse, 2000).

Why firms outsource? Literature from a diverse field of research throws up different reasons for outsourcing. This literature draws from industrial organization, transaction cost and transaction cost economics, measurement concepts of firm and strategic management research. Later in the paper, I group the different rationales into two groups of value and cost and discuss them in detail. To explain in brief here, the value rationale encompasses a host of theories mainly from the strategic management literature. The main idea here is that firms tend to outsource resources or activities which are non value generating and keep the value generating resources or activities in-house. One of the main debates in this field is whether value is created through carrying out unique activities (Porter, 1996) or possession of unique endogenous and resources and capabilities (Penrose, 1959; Barney, 1991).

The cost rationale emerges from transaction cost economics and theories of the firm. Here the main idea is that firm is a co-coordinating entity and it evaluates the efficiency of carrying out a transaction in-house vis a vis the market and only the transactions which are cost effective to produce in-house relative to the market are carried out within the boundaries of the firm. The decision to make or buy essentially rests on transaction costs. There are different interpretations of what is meant by transaction costs. Coase (1937) defined transaction cost as the cost of dealing with the market. It is the cost a firm incurs to look for suitable service or goods providers and the cost of monitoring an external relationship. Williamson (1979) and other proponents of transaction cost economics take the view that firms incur transaction costs or governance costs in any form of economic organisation and it is the comparative costs which is instrumental in deciding the governance structure. The difference in terminology leads to confusion so it is important in the context of this study to specify what is meant by transaction cost when it is mentioned here. Demsetz (1991) defines the costs incurred by the firm when it deals with the market as transaction costs and the governance costs of producing goods and services in-house as management costs. I take this as the working definition and also make the further assumption that management costs are subsumed in the production costs i.e. firms
include management costs as part of the production costs to produce the goods and services in-house.

While these rationales provide an adequate answer in most cases to the question ‘why firms outsource?’, they by no means explain all that goes on. For example, it is difficult to understand from these explanations why firms simultaneously produce in-house and procure from the market the same service. They also do not explain why firms decide to procure a service from the market and then after a period of time decide to discontinue outsourcing and produce the service in-house again, a phenomenon which is called backsourcing (Vining and Globerman, 1999). In short, the existing explanations often do not explain the dynamic nature of outsourcing which takes place in the real world.

*How do firms outsource?* This question has not been met with serious academic research. There is of course a lot written on how firms manage the outsourcing process in the domain of business literature, but these heuristics lack theoretical underpinnings and exhibit a large degree of adhocracy. There is a need for a conceptual framework that has a sound theoretical base but at the same time act as a strategy heuristic for managers. The focus of this paper is to provide such a heuristic.

This study takes the view that the various existing rationales of outsourcing are more complementary rather than being contradictory to each other. Real option theory provides a convenient framework to bring together these largely complementary theories, which exist within and across disciplines, and re-organize them into a coherent heuristic for managerial consumption.

**The value rationale**

The value rationale is embedded in strategic management literature. This body of research is not focused on the ‘make or buy’ decision as such, and is more concerned with issues of competition and achieving sustainable competitive advantage in the marketplace. However, the discussion on how firms achieve that goal does provide insights on how firms can choose activities or capabilities to outsource.
As said earlier, the focus of the strategic management literature is competition. One important question on which there is no agreement is what the source of competitive advantage is for firms. One school of thought notably led by Porter (1996) argues that the source of competitive advantage is the unique set of activities a firm performs. Here the focus is on the external environment which drives how a firm positions itself in the industry. Having positioned itself, a firm attains competitive advantage by carrying out a unique set of activities. Porter (1996) distinguishes between activities which confer competitive advantage and activities which can deliver operational effectiveness at best. Porter considers the activities which do the latter are the ones which can be considered for outsourcing. The role of a firm’s endogenous resources is considerably downplayed in this explanation of a firm’s competitive advantage. Christensen (1997) while explaining why firms fail provides a definition of organizational capabilities which is similar in its scope to that envisaged by Porter. As per Christensen, an organization’s capabilities lies in two places- processes and values and both exist independently of the people who work within the organization. Processes are the methods by which the organization transforms inputs of labor, energy, materials, information, cash and technology into outputs of higher value whereas organization values are the criteria that managers and employees use to make prioritizations decisions. Christensen suggests that the capabilities which can be the source of competitive advantage can also be the cause of firm failure, precisely because they exist independently of the people who work within the firm.

The second school argues that competitive advantage is mainly a product of a firm’s endogenous, idiosyncratic and synergistic resources. The founder of this school of thought is arguably Edith Penrose, who penned the classic ‘Theory of the growth of the firm‘ in 1959. Penrose (1959) suggests that the firm is a pool of resources and many of the important types of resources are heterogeneous in nature. This heterogeneity of resources has a strong influence on the endogenous nature of strategy. This line of thought is very similar to other economists like Nelson and Winter (1982), Teece and strategy academics like Barney (1991) and Prahlad and Hamel (1994).

Prahlad and Hamel (1990) argue that core competencies are the integrative skills of the firm which generate from collective learning. This learning helps the firm to
coordinate diverse production skills and integrate multiple streams of technologies. These skills often embedded within organisation, often within the functions that are commonly known as 'cost centers'.

Barney (2001) argues for a similar position by stating that some factors of production for a firm which would include some of its resources and capabilities are inelastic in supply, because of difficulty in trading them (social complexity). Supply inelasticity implies that firms who possess these kinds of resources and capabilities may be able to generate above normal profits. This above normal profits will be sustainable in the short term at least as they will not lead to increase of these resource and capabilities in the market. This is because of the long time it takes to develop these resources and capabilities (path dependence) and sometimes it may not be even clear how to develop them (causal ambiguity). Implicit again in this argument is the idea that some of the firm’s resources and capabilities are tradable and possession of them in-house does not gain sustainable competitive advantage for the firm in the marketplace.

What is the source of competitive advantage, resources and capabilities or activity systems? Ghemawat et al (1998) takes the view that these concepts are complementary but need to be extended dynamically to account for the ways in which managers can shape the evolution of their firm’s resource endowment over time. As discussed in greater detail later in the paper, this study takes a similar view on the dynamics between activity system and resources. It is the capabilities which give firms the flexibility to choose between alternate governance modes of hierarchy or market, but it is equally true that value is created or destroyed often at the level of the activity system.

**The cost rationale**

The cost rationale is based primarily on the theories of firm which is a loose but complementary body of research on transaction cost, transaction cost economics, new institutional economics, information economics and measurement based explanation of firm (Poppo and Zenger, 1998). The origin of transaction cost approach to explain make or buy decision of the firm can be traced to Coase’s seminal paper published in
1937. According to Coase (1937), the *make or buy* decision of the firm is determined by the cost of transacting through the market. If the cost of transacting through the market is less than cost of producing in-house, then the firm will buy the goods or services from the market otherwise produce them in-house. The cost of transacting through the market includes the nominal price of the goods and services charged by the external supplier, and also the costs of finding appropriate supplier, drawing up contracts and enforcing contracts. Since 1937, when Coase published his paper, there is a growing body of research which tries to determine the factors affecting transaction costs (Williamson, 1979) (Grossman and Helpman, 2002) (Grossman and Hart, 1986; Williamson, 1997). These studies have contributed enormously to our understanding of industrial organization, but the underlying Coasean logic of the *make or buy* decision remains unchanged.

Williamson (1985) argues that the decision to make or buy for the firm is based on three factors- bounded rationality, opportunism (self interest seeking behavior with guile) and asset specificity which affects transaction costs in any exchange. The presence of one of these factors, a combination of two or a combination of all three determine the mode of governance in relation to a particular transaction. The following table makes this point clear:

Attributes of the Contracting Process

<table>
<thead>
<tr>
<th>Behavioral Assumption</th>
<th>Opportunism</th>
<th>Asset Specificity</th>
<th>Implied Contracting Process</th>
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<tbody>
<tr>
<td>Bounded Rationality</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>0</td>
<td>+</td>
<td>+</td>
<td>Planning</td>
</tr>
<tr>
<td>+</td>
<td>0</td>
<td>+</td>
<td>Promise</td>
</tr>
<tr>
<td>+</td>
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<td>0</td>
<td>Competition</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>Governance</td>
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</table>

In relation to the make or buy decision, Williamson explains that when all the three attributes are present, firms will decide to produce the services in-house, while in the absence of asset specificity, but presence of the other two attributes, firms may opt for procuring the services from the market. This of course establishes only a rough distinction between the firm and the market, and is the start rather than the end of the enquiry. As Joskow (1991) elaborates, firms can take on different organization structures and markets can take many different forms ranging from simple spot market transactions to complex long-term contracts which will be driven by combinations of the above attributes.

While transaction cost economics uses the proxy of asset specificity to measure transaction costs, measurement explanation of the firm puts the measurement issue at the forefront of the firm boundary decision. As Alchian and Demsetz (1972) argues firms organize those activities in-house for which the productivity is hard to measure and outsource those activities which are measurable and reward can be directly linked to productivity.

**Uncertainty in outsourcing**

None of the theories directly address the issue of uncertainty, yet uncertainty is inherent in the outsourcing decision. Further the degree of uncertainty varies. In some cases it is high while in others it is moderate to low. What drives uncertainty? Transaction cost economics explains uncertainty by pointing out that bounded rationality and opportunism (behavioral assumptions) are the major causes behind it. In this regard, transaction cost economics has been found less useful in terms of dealing with uncertainty. Indeed the main critique of the transaction cost economics is that while it is a useful positive theory, it creates problems when it applied in a normative sense (Ghoshal and Moran, 1996). There have been counterarguments to this criticism, where it has been asserted that TCE can be used effectively for normative practices.

Without going into relative merits of debate, one can appreciate intuitively the problem of applying TCE in a normative sense. The concept of uncertainty (leading to
opportunism) and its measurement problem is considered as a static concept in an outsourcing relationship in TCE literature, while in reality it is more dynamic. Williamson (1985) argues that uncertainty is one of the reasons that firms produce goods and services in-house. He says that when contingencies that may arise during the life of the contract are too numerous, it may be impossible to agree on a contract therefore preventing parties from concluding a transaction. More specifically, Williamson argues fear of the uncertainty ex post can affect investment choices ex ante. Normatively this means that firms when faced with a level of uncertainty in a potential outsourcing situation need to assume certain costs associated with such uncertainty which will be part of the total cost of exchange in the outsourcing relationship. The problem of measuring such costs is well documented in the literature, so one can safely say that any such assumption of costs would be a rough approximation at best. Yet as the TCE literature suggests this estimated cost of exchange is the basis of a firm’s decision to make or buy. The treatment of uncertainty in TCE literature has been contested. Kogut (1991) for example argues that firms may choose to adopt flexibility in business situations where the uncertainty is very high.

The value rationale does not fare better as a normative theory. As discussed before, the difficulty in identifying the potential rent seeking assets in firms is well documented in the academic literature. The firms are never quite sure ex-ante that the activities or assets they are considering to outsource are non-rent generating ones. This stems from the fact that they are often not aware of the specific rent-generating assets they possess. This is a major source of uncertainty in the outsourcing decision. Managers trying to identify services or activities which can be outsourced can be guided by each of these rationales, even if they are intuitively aware of the uncertainties these rationales bring to the table.

A good example of the above is IBM’s decision to outsource both the microprocessor and the operating system needed for its personal computer launched in 1981. Microprocessor was procured from Intel while the operating system (PC-DOS) was licensed from Microsoft, at that time a fledging software company. The decision helped IBM to get its product to market much faster than it would have been possible if they would have produced the outsourced activities in-house (Teece, Chesbrough
By 1985, four years after the PC was launched, IBM market share quickly grew to 41% and the decision to outsource was apparently vindicated. As Teece and Chesbrough (2000) explain, with passage of time however, ‘the downside of IBM’s decentralized approach became apparent’. The open approach of the company restricted them to direct the PC architecture it had created. The standards in the PC industry were now being created not by IBM but by Microsoft and Intel, and they were the ones capturing the ‘rents’ from these established proprietary standards. By 1995, IBM’s share of the PC market shrunk to 7.5% and the profits were modest to say the least.

Ambiguity on what the core skills or processes are of a firm can be one of the reasons why an outsourcing initiative fails. Quinn (1992) identifies loss of critical skills and loss of cross functional skills as potential pitfalls of outsourcing. Prahlad and Hamel (1994) argues that firms often surrender their core competencies when they cut internal investment, by outsourcing these activities to outside suppliers under the false assumption that they are cutting costs.

As we will discuss in greater detail later, under a real option approach, uncertainty has a positive relationship with the value of the option i.e. the more the uncertainty associated with an outsourcing decision, the more the value of the real option is to the firm which is looking to outsource. The critical difference between TCE and the real option approach is that in certain potential outsourcing opportunities where the uncertainty is too great and satisfactory safeguards (sanctions) are not possible to implement straightaway, TCE would point towards hierarchy (producing the goods and services in-house), while the real option approach will recognize the high value of the real option the firm possesses and can think of ways to manage the uncertainty and establish the outsourcing relationship.

To better understand uncertainty related to outsourcing, it is useful to look at Knight’s explanation of uncertainty expressed in his seminal work ‘Risk Uncertainty and Profit’ published in 1921. Knight’s definitions of risk and uncertainty are based on his threefold classification of uncertain outcomes. Under the first category are the situations where it is possible to deduce the probability of a certain outcome a priori. Example of this is a lottery or rolling of a dice. The second category comprises of
situations where the probability of a certain outcome can be calculated statistically through empirical observations of that event's occurrence. Example of this will be insurance of life, fire and other insurable events. The third category covers situations where there is no valid basis of calculating probability of a certain outcome, as every situation is unique. One can only estimate the probability of the occurrence of a certain outcome. Knight (1971) makes a distinction between risk and uncertainty based on the above classification. The first and second category he defines as risk while the third category is defined as uncertainty.

When a firm embarks on a new outsourcing relationship, often the uncertainty it faces is similar to Knight’s definition of uncertainty i.e. it falls in the third category of uncertain outcomes. The nature of uncertainty in an outsourcing contract is endogenous in nature i.e. it depends on the social interaction of the involved parties. The uncertainty exists because of information asymmetry between the seller and the buyer. The seller knows more about its ability and capability to deliver the services than the buyer who is procuring these services. More specifically, the main source of uncertainty in an outsourcing decision is the governance issues associated with the outsourcing relationship. Conceptually, the total cost of outsourcing is a sum total of production costs and transaction costs. Production cost is direct purchase price of the services procured from the external service provider while transaction costs are the cost of identifying potential breaches of contract, monitoring and enforcement of the contract.

More importantly, I argue that with the passage of time in an outsourcing relationship, the nature of uncertainty changes from uncertainty to risk i.e. the uncertainty becomes increasingly measurable. More specifically the transaction costs associated with the outsourcing relationship which can be only estimated a priori increasingly becomes statistically measurable during the duration of the outsourcing contract.

To summarize, a firm faces two types of uncertainties as it evaluates the option of outsourcing. First, it faces strategic uncertainty in the sense that it can never be sure that the activities or processes they are looking to outsource are not in the nature of their core competencies or contributes in a strategic way to their competitive advantage in the marketplace. As is noted extensively in the strategic literature, core
competencies are notoriously hard to detect and firms are often not aware of their own core competencies or their strategic capabilities. Second, the total cost of outsourcing cannot be measured accurately *ex ante*, which is the other source of uncertainty. More specifically, the total cost of exchange is the sum total of production cost and transaction costs and it is the latter which is hard to measure accurately a priori. The other important attribute of uncertainty associated with outsourcing is that both types of uncertainty reduce with the progress of time in an outsourcing relationship i.e. it becomes clearer with time if the activities which have been outsourced have any strategic implications on the sustainable competitive advantage of the firm and also the uncertainty becomes increasingly statistically measurable.

The concept of real options

Options give the holder of option the right but not the obligation to do something. Financial options like equity options are fairly common and are a popular investment or risk management tool for investors and risk managers. An example of equity option is as follows- Suppose the price of BT share for 1 month delivery is GBP 10. An investor expects price of BT share to rise over the next one month but he wants to protect his downside at the same time. If he buys the share at the future market, he can potentially lose his entire investment i.e. GBP 10 as the price of the BT share can at least theoretically go down to 0 over the next one month. So to protect his downside he can buy an option on BT share, say at GBP 2 (option premium). This option gives the investor the right but not the obligation to buy BT share after one month (time to expiry) at a price of GBP 10 (exercise price). After one month if the price of BT share is more than GBP 10, the option is ‘in the money’ and the investor is going to exercise his option. In case it is equal to or less than GBP 10, the option is ‘out of the money’ and he is not going to exercise his option. Let’s consider two scenarios after 1 month- In the first one, the price of BT share is GBP 20 (strike price). In this case the investor exercises its option. The gross profit from the transaction is GBP 10 (20-10), and the net profit is GBP 8 (10 - 2). In the second scenario, the price of BT share is GBP 5. In this case the investor does not exercise his option and his downside is limited to the option premium he paid i.e. GBP 2.
One can intuitively see the two benefits of the option approach for the investor from the above example- First; it protects the downside for the investor while keeping the upside open. Second, it involves less upfront capital investment. If the investor wanted to buy the BT share outright, he would have to commit GBP 10 while by investing through options he had to commit only GBP 2 initially. He makes the sequential investment of GBP 10 if he exercises the option after 1 month. Of course there is no free lunch, and the investor accepts a reduced payoff incase his view turns out right (GBP 8 instead of GBP 10).

In general, real option thinking in strategic decision making is motivated by the same benefits which an investor or a risk manager obtains using financial options- less capital commitment upfront, minimizing downside risk and greater flexibility in operations. Having said this, there are important distinctions between financial options and real options. One of the important distinction is the way a real option is acquired by a firm vis- a-vis the way financial option are acquired. A financial option can be purchased by anyone paying the specified option premium, whereas acquiring real options is not that straightforward.

So what creates real options for firms? A firm does not automatically have the option to engage in unlimited number of activities. The ability to hold a real option is often path dependent. Owning a patent, a license or copyright, land or mineral rights are all examples of events which confer real options to firms. More significantly for this study, managerial know how and capabilities of the firm are also examples of real options. Seen from this perspective, the firm can be seen as a portfolio of real options. The activities a firm chooses to engage in, can be seen as an exercise of the option by the firm where as other activities which the firm opts not to carry out itself can be seen as holding a real option which has not been exercised. Kogut (2001) argues that a firm’s investment in physical and human assets that provide itself the opportunity to respond to future contingent events and this opportunity is the real option the firm possess. This concept is closely aligned with the resource based view of the firm.

A real call option confers the right to a firm to acquire some real world assets or to produce some real world activities, without the obligation to exercise that right (adapted from definition provided by Feichman, Keil and Tiwana, 2005).
Casual empiricism of the literature on real options shows that the main application of the real option approach, at least in its theoretical form has been in evaluation of new investments by firms. This is perhaps not surprising as the uncertainties related to new project investments are all too clear and the benefit of the real option approach in appraising investment proposal is intuitively understood.

It is also true that in some cases real options are more similar to financial options than in other cases. For example a firm having exploration rights to an oil rig have a real option on making further investment to develop the oil field. The value of this option will reflect closely the value of the holding a financial call option on oil. However, in many cases there is no active market where real options can be traded or objective values can be derived. As Bowman and Moskowitz (2001) explains that in most cases the problem is how to determine the various inputs to the real option model.

**Applying real options to outsourcing**

Outsourcing is in a sense opposite to an investment decision. It occurs out of a decision by a firm not to produce some goods and services in-house and procure them from the market instead. The firm pays out a stream of cash flows and receives goods and services from the external service provider in exchange. It is the net present value of the cash outflows which can be conceptualized as the equivalent of a stock price. The price of the goods and services fluctuate as the actual cash flow varies from the estimated cash flow due to variance in transaction costs. The variance in cash flow is the volatility. The net present value of the cost of producing the goods in-house can be considered the exercise price and the time horizon of the outsourcing decision can be considered as time to expiry.

The fact that a firm was producing certain goods and services in-house before deciding to procure them from the market indicates that the firm possesses capabilities within the organization to produce the goods and services in-house. These capabilities confer the real option to the firm. The costs the firm has already incurred
to developed the capabilities in-house is the equivalent of the *option premium*, which is the amount one pays to acquire a financial option.

During an outsourcing relationship, the firm may incur some costs to maintain a core strategic capability in-house, the net present value of these costs can be considered as *dividends*.

<table>
<thead>
<tr>
<th>Option term</th>
<th>Strategic term</th>
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<tr>
<td>Option premium</td>
<td>Sunk costs in developing strategic capabilities within the organization</td>
</tr>
<tr>
<td>Time to expiry</td>
<td>Time horizon of the outsourcing decision</td>
</tr>
<tr>
<td>Stock price</td>
<td>Present value of cost of transacting with the market (purchase price + transaction cost)</td>
</tr>
<tr>
<td>Exercise price</td>
<td>Present value of cost of producing the services in-house</td>
</tr>
<tr>
<td>Volatility</td>
<td>Uncertainty of the cost of transacting with the market (arises due to fluctuation in transaction costs)</td>
</tr>
<tr>
<td>Dividends</td>
<td>Present value of cost incurred to maintain core strategic capability in-house during the outsourcing relationship</td>
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Real options can be used in two ways in outsourcing. First, it can be used to design an outsourcing strategy. Second, it can be used as a tool to evaluate and measure efficiency of an outsourcing strategy.

It has been argued that the main benefit of real option approach in strategic decision making may be in the design of the decision rather than actual planning evaluation (Bowman and Moskowitz, 2001; Leslie and Michaels, 1997). This may well be true in the case of outsourcing i.e. the larger benefit may accrue to firms by adopting an ‘option thinking‘approach to outsourcing. This is not to say that real option theory
cannot be used to measure the efficiency of the outsourcing decision and I show later in the paper how this can be carried out.

‘Option thinking’ in outsourcing

Strategic thinking on outsourcing can be facilitated by adopting a real option approach. Thinking in such a fashion begins by recognizing that a firm possesses *path dependent capabilities* in-house which are valuable as they confer to the firm the right but not the obligation to produce certain goods and services in-house. It also recognizes the sunk cost which has been incurred by the firm developing those capabilities over time. So it is the capabilities inside the firm which provides the flexibility to choose between ‘make or buy’. Without the capabilities the flexibility does not exist. This view of capabilities is closely aligned with the resource based view of the firm. In the strategic literature, the resource based view and the activity based view of the firm put forward by Porter (1996) is often dichotomized by arguing that only one of these can be the source of competitive advantage. In a sense this is a false dichotomy, as both are important for generating and sustaining competitive advantage for firms. The real option framework provides a useful framework to think holistically about these two generators of competitive advantage. While capabilities gives the flexibility to firms in deciding the ‘make’ or ‘buy’ decision, activities are where the value is actually generated or destroyed. The relationship between capabilities and the activity system is dynamic, as capabilities govern the activity system while the activity system reinforces the firm capabilities.

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<table>
<thead>
<tr>
<th>Capabilities</th>
<th>Flexibility to make the decision</th>
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<tr>
<td>activity system</td>
<td>Decision to ‘make’ or ‘buy’</td>
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In real option terms, capabilities are option generators and the cost incurred by firms to develop these capabilities can be thought of as the option premium paid to acquire these options. The activity systems are the underlying assets which can be either produced in-house or can be procured from the market.

‘Option thinking’ makes the managers think proactively about the uncertainty associated with the outsourcing decision. Managers intuitively understand the uncertainty associated with an outsourcing decision. From the previous discussion, it becomes clear that the uncertainty can be strategic in nature which is difficult to measure as well as transaction cost based which is relatively easier to measure and the uncertainty facing a firm can also be a combination of both. The question managers should ask themselves is ‘what is the level of uncertainty associated with this outsourcing decision?’. If the answer is that it is high, then option thinking may be useful. It may be worthwhile highlighting here again that the uncertainty associated with outsourcing is endogenous in nature. It is an uncertain outcome arising out of social interaction between the firm and the external service provider. It is important to recognize that managers while managing an outsourcing relationship affect the uncertainty associated with that particular relationship.

The treatment of uncertainty under traditional TCE theory is qualitatively different from that under real option approach. Under TCE, if the uncertainty is high and if ‘sanctions’ or safeguards cannot be put in place ex ante, the theory suggests hierarchy is the efficient governance mode of such transactions. Under real option approach, the uncertainty is recognized a priori, but the model tells us that high uncertainty has a higher probability of a greater pay-off i.e. firms also have a chance to benefit more when there is high uncertainty in the outsourcing process. The use of real option approach in outsourcing can be thought as risk management of the uncertain outcome of the outsourcing decision.

*Exercise of the option* by the firm indicates the decision of the firm to discontinue with outsourcing and bringing back the production of the goods and services in-house again. A firm may exercise the option because the option may be *in the money* or in other words the option may have a positive value. The exercise of options in outsourcing relationship is actually quite common. There are numerous examples of
firms bringing back the production of goods and services in-house after outsourcing them initially. The term for this phenomenon is commonly known as backsourcing (Vining and Globerman, 1999). However the decision to exercise the option may not necessarily be dependent on the positive value of the option if calculated on purely financial terms. Following from the earlier discussion on uncertainty associated with outsourcing, it becomes clear that uncertainty can be strategic in nature. Strategic uncertainty relates to potential loss of competitive advantage for firms due to an outsourcing decision and is harder to measure in pure financial terms. The firm may choose to exercise its option in such cases even though the option may have a negative value.

Arguably the main benefit of option thinking in outsourcing is that firms can experiment with outsourcing in a much more intensive manner than would be possible if firms are guided solely by traditional rationales.

**Mapping an outsourcing decision onto options**

Beyond option thinking, another value of the real option theory would be to evaluate and measure the efficiency of an outsourcing decision. Merton’s (1973) equation for a European call option for a dividend paying stock is as follows-

\[ c = se^{-rT} \Phi(d_1) - xe^{-rT} \Phi(d_2) \]
Where:

\[ d_1 = \frac{\log(s/x) + (r - q + \sigma^2/2)t}{\sigma \sqrt{t}} \]

\[ d_2 = d_1 - \sigma \sqrt{t} \]

Here, log denotes the natural logarithm, and:

- \( s = \) the price of the underlying stock
- \( x = \) the strike price

- \( r = \) the continuously compounded risk free interest rate
- \( q = \) the continuously compounded annual dividend yield
- \( t = \) the time in years until the expiration of the option
- \( \sigma = \) the implied volatility for the underlying stock
- \( \Phi = \) the standard normal cumulative distribution function

Adapting from the Luehrman’s (1998) and Leslie and Michaels (1997), the outsourcing decision can be mapped onto an option as follows:

| Outsourcing opportunity | Call option | Variable | | |
|-------------------------|-------------|----------|-------------------|
| Present value of the cost of transacting with the market | Stock price | \( s \) | |
| Present value of cost producing in-house | Exercise price | \( x \) | |
| Estimated horizon of the outsourcing decision | Time to expiration | \( t \) | |
| Time value of money | Risk-free rate of return | \( r_f \) | |
| Uncertainty associated with the decision | Variance of return on stock | \( \sigma^2 \) | |
| Costs incurred to preserve the strategic capability in-house. | Dividend | \( q \) | |
Explaining the variables

The cost of transacting with market has two components, the direct purchase price of the goods or service charged by the external provider and transaction costs i.e. the cost of incurred by the firm governing the transaction. Transaction costs are hard to measure *ex ante* but can be measurable *ex post* through activity based costing, which accounts for all related costs of a particular activity (Qu and Brocklehurst, 2003).

The other variable in the equation which may not be self explanatory is $q$, which is the cost incurred to preserve a strategic capability in-house to produce the outsourced activities during or after expiration of the outsourcing contract. Most firms need to retain a ‘core’ employee capacity within the firm to bring the service back in-house, if required. Vining and Globerman (1999) calls this ‘backsourcing’. The cost incurred by the firm to retain this strategic capability can be considered as dividends $q$ (Leslie and Michaels, 1997).

Variance in transaction costs is a source of uncertainty. The uncertainty variable ($\sigma^2$) also affects the value of the contract is a positive way i.e. the greater the uncertainty greater is the value of the option.

The interest ($r_f$) behaves in similar fashion but the *dividend* or the cost of maintaining a strategic capability ($q$) has an inverse relationship with the value of the option.

The intrinsic value of the option is the difference between $s$ and $x$. The horizon of the outsourcing decision $t$ affects the value of the option in a positive way i.e. the greater the time-value of the contract higher the value of the option.

Real Option Valuation in Outsourcing

We can work with a hypothetical case to explain the option valuation process-

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<th>Table 1</th>
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<td>Outsourcing relationship Option Valuation Analysis</td>
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A firm is looking to outsource a particular business service, say IT support services from an external service provider. The firm does not have a prior relationship with this particular service provider and is looking to start the relationship with a one year contract. The firm has received a confirmed offer for providing the service for GBP 6 Million for 1 year. The firm is aware that the IT support service market is not homogeneous in terms of quality of service delivered and there is substantial uncertainty in the delivery of the agreed level of service. The firm thinks that it would need to monitor this new relationship quite closely and estimates that the associated transaction costs would be GBP 4 Million. The firm has calculated the in-house cost of producing the services at GBP 12 Million. The firm has calculated that the cost of maintaining a strategic core capability of IT support staff in-house is GBP 1 Million p.a. The risk free interest rate is 4.75% p.a.

Mapping these variables in the option pricing model leads to an option value GBP 1.1 Million. This is an in the money option. It should be noted that if one ignores the volatility, the rationale for outsourcing becomes straight forward. It is obvious that it costs more to produce in-house than to procure the services from the market. However with volatility added to the picture, the rationale tilts towards in-house production. This is actually what transaction cost economics tells us i.e. produce in-house when there is more uncertainty. However in this case the firm recognizes that they hold a real call option which is in the money, but embarks on the outsourcing process knowing that the uncertainty in this case is endogenous in nature which will increasingly become measurable as the relationship progresses.
At the end of the 1st year, two things can happen. The total cost of outsourcing can be more than the cost of producing in-house, and in that case the option will be in the money. The total cost of outsourcing can be less than that it costs to produce in-house, and in that case the option is out of the money. In the former case, the firm needs to reevaluate its rationale for outsourcing. The firm may opt to exercise the option and decide to produce the service in-house again. The firm may also choose to continue outsource the services because of strategic reasons. The in the money ness of the option will also play a role in the decision.

**Case study- Brandon Trust**

**Motivation of the case study approach**

The purpose of the case study is to illustrate option thinking done implicitly by managers while evaluating an outsourcing initiative. The purpose of the case study is not to prove or falsify any hypotheses but to show how managers can gain by making intuitive option thinking more explicit.

**Introduction and background-Brandon Trust**

Brandon Trust is a not for profit organization engaged in providing health and social care services to people with learning disabilities. Brandon Trust was established in 1994, and over the past years has seen considerable growth in operations. During the past ten years Brandon Trust has built up its reputation as a progressive organisation, and is currently one of the major providers of services for people with learning disabilities in south west England. The Brandon Trust currently works in partnership and receives funding through the following agencies: Bristol Social Services & Health, North Somerset Social Services, Bath & North East Somerset Social Services, South Gloucestershire Social Services, Primary Care Trusts across the region, Learning & Skills Council, Workforce Development (NHS), TOPSS, European Funding Schemes. The major purchasers of Brandon Trust’s services are the four local Unitary Authorities (Local Government) and the Health Service (Primary Care Trusts).
Brandon Trust provides a variety of health care services. The services can be grouped into two categories- Residential Care and Day Services. Under residential care, Brandon Trust runs homes which provide residential health care services to people with learning disabilities. There are two types of residential homes, Brandon Trust offers, Care Homes and Nursing Homes. The main difference between the two is that while in the former the staff are not required to be professionally qualified in health care, in the latter presence of a qualified nurse is mandatory. In Day Services support is provided that is not necessarily health care related. The organisation helps individuals pursue work experience, training, employment and education, as well as leisure and social interests. Brandon Trust tries to differentiate itself in the market by providing a range of services which are often complementary to each other and thus act as a one stop solution for customers who may require more than one of these services. ‘Intensive support’ is such a service solution which has been recently launched by Brandon Trust to add value to the experience of its clients.

Although Brandon Trust is a not for profit organization, it is more similar in its operations to ‘for profit’ organizations than to the traditional ‘not for’ profit organization. Brandon Trust competes in the health care market in a similar fashion to a ‘for profit’ organization. It does not receive any donation or funding from the government and its operations are sustained by the revenue it generates. A technical distinction between Brandon Trust and for profit organizations is that the latter can pay dividend to its shareholders while Brandon Trust is not allowed to do it. In fact it does not have any shareholders but a board of directors. Moreover, Brandon Trust is revenue surplus i.e. its revenues exceed its costs. In 2004-05, it added GBP 900,000 to their reserve which is the amount of profit it generated from its operations. Brandon Trust’s competitors are other not for profit organisations as well as for profit organisations. The basis of competition is often not price in this industry. Due to the nature of the service which caters to a segment of the population who are often vulnerable and in such services the integrity and delivery track record of the service provider is of paramount importance. Local councils are endowed with funds for procurement of these services and they are more concerned with the track record and integrity of the service provider rather than going with the least cost provider of such services.
Though people with learning disabilities are the direct consumers of Brandon Trust's service, they are not the ones who pay for it directly. The local government is the purchaser of Brandon Trust's services. Most health services are provided free of cost in United Kingdom by National Health Service (NHS). However in mid 1990's, striving for efficiency and cost reduction, government decided to contract out some services which have been traditionally provided by NHS but are not health care professional intensive i.e. it does not require doctors or trained nurses to carry out these services. Service providers like Brandon Trust, compete to win these contracts from the local government. People still get these services free of cost, but Brandon Trust bills the local authority for the services delivered.

CSCI (commission for social care inspection) plays an important role in quality control of the services which Brandon Trust provides. All the private social care services is audited by CSCI for quality control and it is through them the consumers get a chance to voice their opinion about the services they are consuming. CSCI normally carries out two audit checks per calendar year.

All the residential homes are owned and operated by Brandon Trust while many of Day Centers are owned by the local government with the operations being managed by Brandon Trust.

The organization has witnessed rapid growth over the years. In 1994 the firm had five employees which grew to over 1100 full time employees in 2004. The revenue has grown from GBP 4.5 Million in 1994 to GBP 21.5 Million in 2004.

There are three definitive group of stakeholders for Brandon- Consumers- these are the people who have various health and social care requirements and who avail of Brandon’s services. Purchaser- The purchaser of Brandon’s service are the local councils who are endowed with funds to procure these services from private social care providers. Auditor- The quality control of the social care services is primarily carried out by CSCI (commission for social care inspection).
The health and social care industry in UK

Long term care and intermediate care has been increasingly privatized by the NHS (National Health Service) over the years in the UK. These services which were previously delivered by NHS hospitals are now increasingly delivered through private nursing homes and in 2001 over half of the health care beds in England were in the privatized nursing home sector (Kerrison, Pollock 2001). Though such services have been privatized or in a sense outsourced by local authorities, the health care system remains a publicly funded healthcare system. This raises issues of incentives and quality control of the private service providers. Due to the way the market has been privatized, the purchasers of these services are not their consumers. The purchasers are local authorities, while the consumers are general public who are in need of such services. To make the process more accountable, the British government in August 2004 constituted the Commission for Social Care Inspection (CSCI), which is responsible for the overall social care inspection and regulation. The ethos of the government behind such privatization strategy is arguably of maintaining accountability of public services through regulation without necessarily providing the services itself (Mandelson, Liddle 1996)

Outsourcing in Brandon Trust

Given the not for profit nature of Brandon Trust, it may be something of a surprise that Brandon Trust has quite actively experimented with outsourcing. As discussed before, the way Brandon Trust competes in the market is qualitatively not very different from a for profit organization. This competitiveness along with the initial small size of its operations has contributed to the outsourcing initiatives of the organization.

Brandon has experimented with outsourcing over the years. In the past they have outsourced the IT system and Payroll services but have since discontinued outsourcing these services and have brought them in-house again.
Hilary Pearce, Director Finance and Business System comments ‘Outsourcing has not worked for us. I think our size is an issue. We are either too small or too big. If you are a small enterprise, it makes sense to outsource as the size does not make a case for a full time employee. However, as soon as you grow to a certain size, you need a person in-house to co-ordinate the increase data flow between the organization and the external service provider. At the same time you have a sense of loss of control as you are not in charge of operations. The external service provider is generally inflexible to our needs and the pricing system is often prohibitive. Our payroll service provider for example was charging us ‘per pay slip’ processed basis. This system was fine as long as the size of the employees was small. Then, as our employee size grew, we asked them to change the pricing basis as the marginal cost of processing extra pay slips should get increasingly lower with increase in number pay slips processed. The service provider was not agreeable to change to the terms and so we discontinued the service. We had to employ a full time employee anyway to co-ordinate the data flow and that person can now be better utilized to process the pay slips in-house. I also believe that if we were a bigger company than we are, we could have brought scale as a bargaining chip and the external service provider perhaps would have been more amenable to our demands.

Hilary Pearce observed further ‘Our experience with IT systems outsourcing is similar. The main issue was the feeling of loss of control and the speed of response of the external service provider and I feel that we are better off producing these services in-house’.

Going forward, Hilary Pearce said that Brandon Trust does not have plans to outsource any services and in fact has insourced services which they were procuring from the market earlier. Hilary Pearce explains ‘we are in fact insourcing some of the services which we were previously procuring from the market. We were earlier procuring NVQ (national vocational qualification) accreditation services for our social and care workers from external accreditation agencies. Two years back, we decided to have our own accreditation service and now we provide NVQ accreditation to our own workers and the scheme has worked quite well. We are now thinking of ramping up this service and providing it to workers outside our organization’.
Brandon Trust’s reluctance to engage in outsourcing is also reflected in the fact that future capital investments in IT are geared to build capabilities in-house rather than procure these services from the market. Brandon Trust is currently looking to make substantial capital investment to implement an enterprise wide HR, payroll and rostering software system, and is planning to increase its IT staff strength to manage the expanded IT resources. Abid Mohammed, a KTP (knowledge transfer programme) Associate from University of the West of England, who is helping Brandon Trust to design and implement the IT project, comments ‘There were several options available to Brandon, but it was felt that outsourcing could not provide the flexibility both in terms of control and cost that Brandon wanted. We have gone to the market to procure systems rather than develop a bespoke solution as I see no point in reinventing the wheel and I am sure there are vendors that can and will meet our requirements. The outcome for the future is to have low maintenance systems in place that can be supported by the current IT Manager and one or possibly two members of staff.’

**Analysis**

The case of Brandon Trust shows the problem in applying traditional rationales to explain why Brandon Trust outsourced in the first instance and then discontinued outsourcing. The uncertainty Brandon Trust faced cannot be explained in terms of asset specificity or opportunism.

The uncertainty in this case is the endogenous uncertainty which existed between Brandon and the external service provider. This endogenous uncertainty is primarily because of the information asymmetry which exists at the beginning of the outsourcing relationship. The service provider knew more about its service offering than Brandon Trust, who can only guess the transaction costs it will incur to govern this particular outsourcing relationship. As time progressed, however the transaction costs actually incurred became a better indicator of the transaction costs likely to incur in the future, and the uncertainty associated with transaction costs became progressively lesser. It is important to note here that the uncertainty in this case has less to do with asset specificity which is put forward as the source of uncertainty in most of the transaction cost economics literature. Both Brandon Trust and the external
service provider did not make any investments which were specific to that relationship, yet Brandon Trust faced considerable uncertainty in the beginning in relation to the transaction cost it is likely to incur.

The case study highlights the importance of measuring primary transaction costs rather than depending on secondary proxies like asset specificity to ascertain the level of transaction cost in an outsourcing relationship. Brandon cost incurred real transaction costs of governing the outsourcing relationship in case of outsourcing the payroll services. One employee had to be assigned exclusively to manage the interactions between the firm and the external service provider. The cost of governing the transaction became prohibitively expensive for Brandon and they ultimately decided to discontinue outsourcing of this service and started to manage payroll in-house again. This highlights the fact that transaction costs can often exceed the nominal procurement price in an outsourcing relationship and can make the outsourcing proposition unattractive.

Brandon Trust has engaged in what is known as *backsourcing*, i.e. it has brought back the services outsourced in-house. In real option terminology, we can say that Brandon Trust exercised its option to produce these services in-house. Obviously, the managers in Brandon Trust did this more intuitively and they cognitively did not apply real option thinking to come to this decision.

One can however see how real option thinking can be applied to evaluate an outsourcing relationship and come to a decision. As the transaction costs of governing the outsourcing relationship increased, the real option value of producing the specified set of activities in-house increased simultaneously for the firm. This means that now it made more sense to produce the set of activities in-house rather than procuring it from the market. Also with the progress of time, the uncertainty associated with the outsourcing relationship reduced i.e. the firm knew that the transaction cost which it has incurred in the past will be indicative of the transaction cost it will incur in the future. This meant there is less likelihood of diminishing transaction costs in the future and hence less probability of the value of the real option becoming less valuable in the future. So the firm decides to exercise its option of discontinuing the outsourcing relationship and produce the set of activities in-house.
Conclusion

The case study suggests that firms can potentially benefit from real option thinking while governing an outsourcing relationship. The reasoning that Brandon Trust applied to discontinue its outsourcing relationship can be easily replicated by using a real option theory. A logical question which can arise is why this is important? After all the Brandon Trust case can also be explained in terms of economies of scope and resource based view of the firm. The main benefit of using the real option theory is arguably is in its focus on uncertainty which is also critical in the outsourcing context. Real option theory helps firms to recognize explicitly the presence of uncertainty and also its properties. The treatment of uncertainty in real option theory is also qualitatively different from that in traditional transaction cost economics. Whereas in traditional transaction cost economics, existence of uncertainty without sanctions (safeguards) leads to hierarchy, in real option theory, uncertainty shows the potential of greater benefit of outsourcing and may lead to greater experimenting with outsourcing. An added benefit which accrues to a firm by bringing such thinking from an intuitive level to a conceptual model is that it can actually assign values to the model and make the case more explicit.

In this paper, I have tried to put forward a strategic heuristic for outsourcing. The real option theory provides convenient framework to bring together the different but largely complementary existing concepts on outsourcing and reorganize in a coherent heuristic for managerial consumption. Arguably a benefit of such a heuristic is that it enables firms to experiment with outsourcing in a more intensive fashion than possible if they are guided by traditional rationales.

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