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Contracting out and the Price of Burning Bridges

D. J. Johnstone
University of Wollongong

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CONTRACTING OUT AND THE PRICE OF BURNING BRIDGES

by

David Johnstone

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David Johnstone
Professor
Department of Accounting and Finance
University of Wollongong
NSW 2522
Australia

d.johnstone@uow.edu.au

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Abstract. The outsourcing of government activities is justified primarily on the grounds of cost savings. In the process of determining whether there are potential savings from contracting out, government agencies are required by various Commonwealth and State Government guidelines to measure the relevant costs of in-house activities and to compare these with external bids. The cost comparison methodology advocated in these guidelines is flawed in that it makes no allowance for the financial value of the *option to contract out* (and thus *not to contract out*). It is wrong to give up (exercise) this option unless the expected cost savings accruing from outsourcing at least equal its value. Contrary to the guidelines and traditional capital budgeting decision criteria, it is not sufficient that expected savings are merely greater than zero. Indeed, depending on the value of the option to contract out, the cost savings expected from outsourcing may have to be very large before a practically irreversible decision to outsource is warranted financially. Like other options, the option to contract out provides a hedge against uncertainty, and is all the more valuable the more uncertain (less predictable) the agency's future costs of in-house and external service arrangements. In the face of inevitably uncertain cost streams, there is much to be said for conserving all available options. By interpreting the option to contract out as a financial asset with financial value, this intuitive strategic principle is given a basis in "rational economics".

The primary argument for contracting out (outsourcing) government activities (e.g. public transport, gaols) and sub-activities (e.g. cleaning, data processing) is that the costs of these activities, borne by the taxpayer, are reduced (Domberger 1994; Domberger and Farago 1994; Domberger and Rimmer 1994). Rather than incurring the many costs of the in-house service function (e.g. salaries, capital equipment, rentals etc.) the government agency pays the contractor an agreed fee for an agreed service period. Through outsourcing, many if not most of the costs which would otherwise have been incurred by the agency are shifted to the contractor, but because of the contractor's relative efficiency there is an overall cost saving on the activity. Some of this cost saving accrues to the agency and the remainder is the contractor's profit or return on investment.

To assess whether a service price tendered by a potential contractor affords the agency any cost saving, it is necessary to assess the costs of in-house service provision. In Australia, the Commonwealth Department of Finance and all State Treasuries have issued technical papers on the measurement of in-house costs and their comparison with the costs of contractors. As is to be expected of technical standards, these costing directives are all very similar, and in some fundamental respects, essentially identical. Indeed their similarity extends to a common set of mistakes, all of which tend to favour the contractor over the in-house provider. See Johnstone and Walker (1997) for details.

The purpose of this paper is to discuss just one of the points on which the various costing-for-contracting guidelines are flawed. Unlike some of the technical mistakes evident in these documents, this is not a straightforward matter of cost accounting methodology. It is a less obvious but perhaps more significant matter, more of finance and financial strategy than accounting, concerning the recognition and valuation of an option, namely the option to contract out.

Most options are of value and in fact some, such as "put" and "call" options on shares, are bought and sold, for a price. It is always nice to have options, of whatever kind. An option represents a kind of insurance or hedge against uncertain events. For example, if I am looking to buy a house and am worried that prices might become too high before I find what I want, I might pay someone $5000 to take a one month option (a "call" option[1]) on their house. This option gives me the right to come back anytime within the month and buy that person's house at the previously agreed price (the

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[1] A "call' option is the option (but not obligation) to *buy* an asset at a pre-agreed price (within a given period). A "put" option is the option to *sell* an asset at a previously agreed price.

"exercise" or "strike" price). So now I can search for another month comforted by the thought that if I find no better affordable house, I have one to go back to. This is a valuable option, something I am prepared to pay money to have. It is a financial (as distinct from physical) asset, something which I could sell at a price (perhaps a profit) to another house buyer in the same circumstances as me. In the fortunate case when I find a better house it will cost me nothing to hold to expiry, and in the other case I will exercise it and benefit from it. At present, before the month is up, I am not sure which of these will be the ultimate outcome, but just a chance of the latter occurring is enough to give the option a financial value greater than zero (and to induce me to pay $5000 to buy it).

Government agencies, before they contract out, have the option to do so (and thus not to do so). Generally, or often at least, a decision to outsource is practically irreversible, at least in the near term, usually for reasons of financial and perhaps political cost. Once a function is contracted out and the in-house activity wound up, there is no option to "contract-in" (i.e. to return to the in-house provider). Rather, it is only before an activity is contracted out that the agency has an option, or at least a valuable option.[2] Like other options, the option to contract out is a hedge or kind of insurance against events which may or may not occur but which are potentially damaging if they do occur. In the case of contracting out, the hedge is against the event of in-house costs increasing (or increasing further) relative to the price of a contractor. If indeed this event occurs, the agency has the option to avoid cost increases by contracting out. If it doesn't then the agency benefits from the relatively low in-house service costs. Either way, it is "covered".

The beauty of an option is that it can never make things worse but can possibly make them better. The worst possible outcome is that the option is of no use, in that exercising it would hinder rather than help. For example, if the costs of insourcing fall markedly, to the point where they are clearly and reliably less than the expected costs of outsourcing, then the option to outsource is of no consequence and is valueless (in finance terms it is "out of the money"). It is not of negative value, however, because by definition there is no obligation to exercise it. On the other hand, if for example outsourcing costs become certainly less than those of insourcing, then the option to outsource is immediately valuable ("in the money"). Simply by exercising this option costs are saved and hence value is added. There is, therefore, a

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[2]There is perhaps always the option to switch back or "contract-in", but if the cost of exercising this option is prohibitive then the option is valueless. This is the same as a call option to buy a share or a house (or any asset) at a price much greater than its market price. Such options exist but are valueless.

kind of asymmetry in the results of holding an option, whereby things can end up better, possibly much better, but cannot end up worse. Given even a slight chance of the former, the average or "expected" value of the option (and hence its current "price") is greater than zero.

Note that once the agency exercises its option and contracts out then it is no longer hedged. Instead it is exposed to the costs of outsourcing, however much these increase. Moreover, once this option is exercised, it is lost and so is its financial value (Aggerwal 1993a, p.27). The crucial point of principle is that any decision to exercise an option should not be made without consideration of the value of that option. By the fact that an option may just possibly be very useful at a later date, it has value today. A problem with conventional capital budgeting (present value) analysis, typified by the various Governmental costing/market testing technical statements, is that the values of implicit or embedded options, such as the option to contract out, go unrecognised:

> ...traditional capital budgeting procedures have generally ignored the valuation of
> options created by investment. Such options are valuable whether or not they are
> exercised and should be included in assessing the benefits of such an investment [in the
> case of contracting out, divestment]. (Aggerwal 1993b, p.2)

When an agency exercises its option to contract out, no equally valuable option is acquired with the contract agreement. To write into a contract the option to switch back to in-house provision within the life of the contract may be possible but must add greatly to the contractor's risk (and thus fee) and can scarcely be practicable financially. The contractor will certainly not provide such an option for free. Of course, the agency can give itself some possibility of switching back without being obligated to the contractor for a long period by contracting for a only short period. The problem with this is that the agency is then exposed to possibly large increases in contractor fees at the end of this short period, the prospect of which can only take away from the justification for contracting out in the first place.

No rational party can offer a valuable option for free, or give one up for nothing. However, this is what Government agencies are prompted to do by the various governmental costing guidelines. In following these technical guidelines, government agencies are not required to take into account the financial value of the option they give up when they contract out. This option is foregone routinely without compensation, indeed without valuation or even recognition. Specifically, the numerous costing-for-contracting guidelines promulgated by State Treasuries and

related bodies require only that government agencies compare the two (or more) cost streams on offer, those of the in-house provider and the external contractor(s). If the expected costs of the contractor (contract fees) are currently lower, in discounted present value terms, than those of the internal provider, then the decision is to contract out.[3] This decision rule is wrong in principle, both strategically and technically.

In terms of strategy, it is wrong to outsource just because the contractor's costs are somewhat lower on present expectations than those of the in-house provider. Rather, before making such a practically irreversible decision, the agency must be satisfied that the cost difference in favour of the external provider is, for reasons of its magnitude or otherwise, sufficiently unlikely to shift in favour of the in-house provider in the future (i.e. soon enough to make a difference in present value terms). If the cost difference favouring the contractor is likely or even possibly only temporary, then in the short term it may well be worth paying the marginally or even significantly higher costs of the in-house provider so as to keep open the option of staying with that provider in the long term:

> It is well known that one of the most significant advantages of flexibility is to provide the production process with the ability to modify itself in the face of uncertainty. Recent studies have addressed the issue of the economic value of flexibility in terms of its *option* value. (Kulatilaka and Marks 1988, p.574)

Once the decision to contract out is affected, the possibility of retaining the in-house service function is lost. With this in mind, the additional service cost of the in-house arrangement can be thought of and justified as an insurance premium, in the same way as the agency pays to insure against other potentially costly contingencies (e.g. fire).

In technical terms, the decision rule advocated by the various costing guidelines is to contract out if

$$PV_{ih} > PV_{oh},$$

where PV_{ih} represents the discounted present value of the projected in-house cost stream, and PV_{oh} represents the present value of the projected fees payable to the contractor. This rule is incomplete and should be changed to allow for the financial

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[3]References include the guidelines of the Queensland Treasury (1995, p.30) and NSW Premier's Department (1992, p.29-30). The same decision rule is proffered in the British Governments *Guide to Market Testing* published by the Efficiency Unit, Office of Public Service and Science (1993, pp.75-7).

value of the agency's contracting option. Specifically, contracting out is warranted on financial grounds only if

$$PV_{ih} - PV_{oh} > v,$$

where v denotes the value of the option to contract out.[4] That is, the agency should contract out only if the expected cost saving from contracting (measured in PV terms) exceeds the value of the option (asset) which it is exercising and thus giving up.[5] It is not sufficient that there is a cost saving if that saving is less than the option value foregone (Pindyck 1988, p.969; 1991, pp.1110, 1112). Note that the above rules assume zero transition costs. To allow for transition costs t, the appropriate rule is to contract out only if the present value of future cost savings exceeds $v + t$.

It is possible theoretically to use the techniques of corporate finance to measure the value v of the option to contract out. This valuation process is demonstrated in an appendix, in the highly simplified context of a two-period contracting model. A mathematically more general option pricing model applicable to contracting is developed in Edelman and Johnstone (1997).

In real world contexts it is unlikely that the option price v will be measurable reliably (Pindyck 1991, p.1143). Unlike equity or share markets, where option prices are readily determined, there are not the required statistical inputs. In particular, stochastic models of the future costs of in-house and external service provision are bound to be unreliable. It is possible, however, to learn from the mathematical theory of options pricing about the factors which make option values higher and lower. For example, it is well known in finance that the value of an option depends very largely on the *degree* of uncertainty surrounding the hedged variable (which, in this case, is the difference between the costs of in-house and external service provision). The greater this uncertainty, the greater the value of the option. This means, for example, that if there is much uncertainty concerning the amount of contractor fees after the original contract period, as might be the case when the contractor has no competitor constraining its contract renewal bid, then the option to contract out (and thus equally to not contract out) is highly valuable and should be seen as such in any rigorous market testing or CCT (compulsory competitive tendering) process.

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[4]Strictly, this condition should be written in terms of *expected values*, since allowance for the option value v requires an admission that the amounts of future costs are random (uncertain) variables.

[5]It is perhaps easiest to understand this option as the option of staying with the in-house provider, as that is in effect what is being given up.

It is undoubtedly true that many managers within the public sector understand intuitively the value of unburned bridges, and thus the price of burning those bridges. On the basis of this intuition, there may be some strategic reluctance towards contracting out, or at least towards racing into irreversible decisions. The argument put in this paper affords a "rational economics" basis for such intuitively justifiable reluctance. Specifically, before a service function is contracted out, or privatised (the argument is the same), the agency has the option to maintain in-house service provision. After contracting out it does not. This option is a financial asset, with a financial value, and should only be given up in exchange for a price (cost saving) exceeding that value. It should certainly not be given up for nothing (cf. Edleson and Reinhardt 1995, p.251). This, however, is what in effect the various "official" cost comparison (market testing) guidelines advocate. The effect of these guidelines is that many activities will have been privatised and contracted out before those issuing contracts and driving the contracting process appreciate fully, in merely economic terms, what is being foregone.

A similar, indeed analogous argument is now well established in environmental economics. This argument, following the independent expositions of Arrow and Fisher (1974) and Henry (1974) proceeds as follows. In contemplating irreversible environmental destruction (e.g. the Lake Pedder dam) value should be given to the option to wait and learn. If there is any prospect of information arising on which the value of the environment being considered for destruction may increase (as has happened with Lake Pedder) then the mere possibility of this information coming about makes the option to destruct, and thus not to destruct (i.e. to preserve) valuable:

> [T]he mere prospect of getting fuller information, combined with the irreversibility of the non-preservation alternative, brings forth a positive option value in favor of preservation. (Henry 1974)

Here environmental destruction equates to contracting out or privatising, a similarly irreversible albeit not so fundamentally conclusive action. The logic of the Arrow-Fisher-Henry "value of waiting" (i.e. waiting for further information) argument can be summarised as follows:

> Given that development is both irreversible and indivisible, a decision maker who ignores the possibility of acquiring further information about the consequences of development inevitably underestimates the benefits of preservation to some degree. This is because the irreversibility creates an asymmetry. If he decides to preserve now, he can always develop later if subsequent information warrants it; but if he decides to develop, the decision cannot be reversed regardless of what the information reveals. In the first case, there is flexibility with respect to future decisions, and the information has some

potential value; in the second case, there is no flexibility, and the information has no economic value. Thus, when future learning is taken into consideration, there is an extra component to the benefits associated with preservation. This component or flexibility premium is what AFH called option value. (Hanemann 1989, p.34)

The Arrow-Fisher-Henry argument and notion of option value applies as well to contracting out as to environmental destruction, and in essence anticipates the point of view regarding outsourcing put forward in this paper. In both contexts, the conclusion is that irreversible action can indeed be justifiable economically, but only if the consequent benefits are of sufficient magnitude or certainty to warrant the risk that within some possibly short time of our having, without necessity, taken such action, we may wish we were still in a position to choose.

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Appendix

To demonstrate the value of the option to contract out, consider the following simple model. A government agency has an in-house activity with uncertain future costs, and is considering contracting this activity to an external supplier with similarly uncertain but different future costs (i.e. periodically negotiated contract fees). These two possibilities are represented on "time lines" as follows, where "time 0" is "now" (the current decision point).
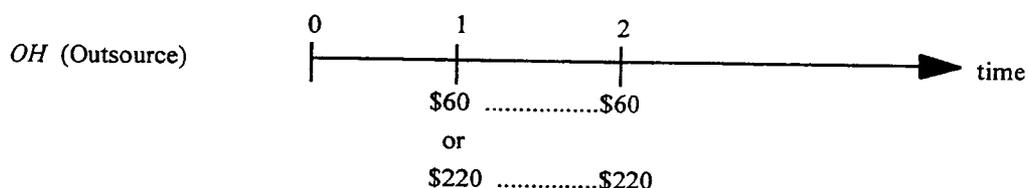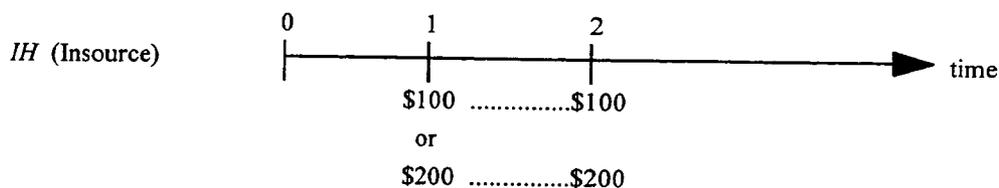
In each case, the costs in period 1 (shown at time 1) can take one of two possible values. The in-house [IH] costs in period 1 can be either $100 or $200, with say equal probability, and the contractor [OH] fees can be either $60 or $220, also with equal probability. With either alternative, the costs in period 2 will be the same, with certainty, as for period 1. The "time horizon" is just two periods (i.e. a two period model). Given this information, which of the two service providers, *IH* or *OH*, should be chosen? The conventional answer to this question, as exhibited in the various costing guidelines, is found as follows:

The expected costs per period of *IH* are $150 (i.e. (100+200)÷2) and hence the present value of expected costs (at time 0) is

$$EPV_{ih} = \frac{150}{(1+r)} + \frac{150}{(1+r)^2} = \$260.33,$$

taking $r=0.10=10\%$, for example, as the chosen discount rate.

By comparison, the expected costs of OH are \$140 per period, and hence the present value of expected costs is

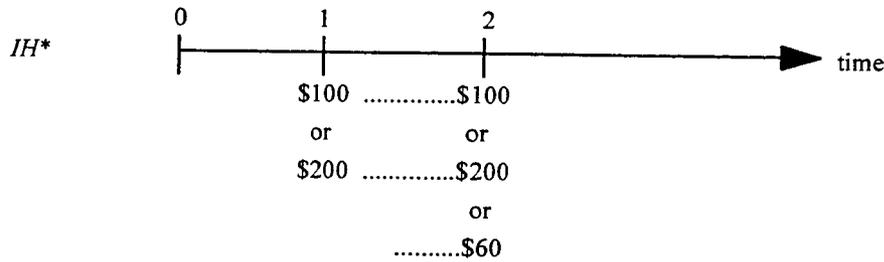$$EPV_{oh} = \frac{140}{(1+r)} + \frac{140}{(1+r)^2} = \$242.98,$$

again taking $r=0.10$. This is less than EPV_{ih}, and hence the apparent conclusion on cost grounds is that the activity should be outsourced.

Such is not the conclusion, however, when the option to contract out is valued and taken account of in the calculations. To find this value, consider a third alternative, that of persisting during period 1 with IH and then deciding at the end of that period (at time 1) whether to stay in-house during period 2 or to contract out. Denote this alternative by IH^* so as to distinguish it from IH. Specifically, IH^* is IH with the option of switching to OH at the end of period 1. Under IH^* the agency stays with the in-house provider for period 1 but recognises the right to switch to OH for period 2. That is, it keeps its option to remain with IH or switch to OH open for another period. At the end of period 1 it will decide on whichever provider had lower costs in period 1 (assuming zero transition costs), since both providers' costs will remain the same in period 2. There are four possible outcomes, each with equal probability (assuming statistical independence):

Possible Outcomes (Period 1 costs)

IH	OH	Switch to *OH* at time 1?	Period 2 Costs
100	60	Yes	60
100	220	No	100
200	60	Yes	60
200	220	No	200

Given these four possibilities, and assuming rational choice at time 1, the possible but still uncertain costs of IH^* are shown as follows

IH* 0   1   2
     ├──────┼───────┼──────────────▶ time
         $100 ....$100
          or   or
         $200 ....$200
                          or
                  ....$60

and the present value of expected costs of IH^* is

$$EPV_{ih^*} = \frac{150}{(1+r)} + \frac{1}{(1+r)^2}\left[\frac{1}{2}(60) + \frac{1}{4}(100) + \frac{1}{4}(200)\right] = \$223.14,$$

with $r=0.10$. This is the lowest present value of the three alternatives, OH, IH and IH^*, which means that on grounds of least expected cost IH^* is the best action.

Further, the value at time 0 of the option to contract out is implied. This value is

$$v = EPV_{ih^*} - EPV_{ih},$$

which for $r=0.10$ equals $\$260.33 - \$223.14 = \$37.19$.[6]

Note that the option value v can be zero but never negative, since EPV_{ih^*} can only be less than or equal to EPV_{ih} (i.e. rational use of the option to contract out can lead to a cost reduction but not to an increase).

The decision rule which accounts for the value of the option to contract out is to outsource if

$$EPV_{ih^*} > EPV_{oh},$$

or in terms of v, if

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[6] It is known from options pricing theory that the value of an option is greater the longer its lifespan (time to expiry). Because we have assumed only a two period model, time to expiry is short. In real world contexts, the time to expiry of the option to contract out is unbounded, and hence this option is limited time-wise only by the "time value of money" and the consequent immateriality of cost savings not achieved until well into the future.

$$EPV_{ih} - EPV_{oh} > v,$$

these being different mathematical expressions of the same rule.

This rule departs from the conventional present value decision criterion advocated within the various official costing guidelines. The conventional rule is to contract out whenever

$$EPV_{ih} - EPV_{oh} > 0.$$

The technical oversight implied by this convention is of the value v of the option to contract out, an option which is being exercised, and hence lost, without having been priced or accounted for.

This kind of loss is implicit whenever an action taken is in any way irreversible, since once such an action is taken the option not to take it, or to wait before making a decision (on what would by then be further evidence), is foregone. There is thus a loss of opportunity and hence potentially a loss of money. Such loss is incurred when a firm makes an irreversible investment or divestment.

Contrary to the technical guidance provided by the various governmental market testing manuals, it is has become in recent years an established principle in financial economics that no such investment (or divestment; e.g. liquidation of productive assets) should take place unless its "value added" (NPV) at least compensates for the loss of the "option to wait". Although applying explicitly to circumstances of potential investment rather than potential divestment, the following quotes from the literature on what are known as "real options", demonstrate the importance afforded by financial economists to making allowance for implicit option values in all capital budgeting analyses:

> When investment is irreversible and future demand or cost conditions are uncertain, an investment expenditure involves the exercising, or "killing," of an option - the option to productively invest at any time in the future. One gives up the possibility of waiting for new information that might affect the desirability or timing of the expenditure; one cannot disinvest should market conditions change adversely. This lost option value must be included as part of the cost of the investment. As a result, the Net Present Value (NPV) rule "Invest when the value of the unit of capital is at least as large as the purchase and installation cost of the unit" is not valid. Instead the value of the unit must *exceed* the purchase and installation cost, by an amount equal to the value of keeping the firm's option to invest these resources elsewhere alive - an opportunity cost of investing. This aspect of investing has been explored in an emerging literature [showing] that with

even moderate levels of uncertainty, the value of this opportunity cost can be large, and investment rules that ignore it will be grossly in error. (Pindyck 1988, p.969)

Management's flexibility to adapt its future actions in response to altered future market conditions expands an investment opportunity's value by improving its upside potential while limiting downside losses relative to management's initial expectations under passive management. The resulting asymmetry caused by managerial adaptability calls for an *expanded* NPV rule reflecting both value components: the traditional static or passive NPV of direct cash flows and the option value of operating and strategic adaptability. This does not mean that traditional NPV should be scrapped, but rather it should be seen as a crucial and necessary input to an options-based expanded NPV analysis: Expanded (strategic) NPV = passive NPV of expected cash flows + value of options from active management. (Trigeorgis 1995, p.2)

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