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by

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Abstract. The *minimum* agreeable transfer price in a transfer of goods between autonomous divisions of a decentralised firm is given by what has become known as the "general rule". According to this rule, the least price acceptable to the transferor division is the sum of the transferor's incremental or outlay costs and any associated "foregone contribution" (opportunity cost). The same rule can be shown to apply to transfers of services as well as goods, provided that the transferor's "foregone contribution" is interpreted in relation to the replacement cost of the services (professional time) transferred. Specifically, "foregone contribution" is defined as the minimum of the contribution margin available to the transferor from the services transferred and the replacement or "outsource" cost of those services. This measure of foregone contribution is analogous to Bonbright's notion of "deprival value" and implies a "more general" general rule, upon which the minimum transfer price of services may be determined not by what those services offer in the way of contribution, but by their (lower) replacement or outsource cost.

Key Words. Transfer pricing, general rule, services, foregone contribution.

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Introduction

Following what has been called "the general rule", the minimum possible (mutually agreeable) transfer price in an exchange between two autonomous divisions within a decentralised organisation is given by the incremental cost of the commodity transferred plus any resultant opportunity cost or "foregone contribution", both measured from the perspective of the transferor.[1] That is, the minimum transfer price is given by the sum:

$$\text{incremental cost} + \text{foregone contribution.} \qquad (1)$$

This formula or "general rule" [hereafter *GR*] yields a transfer price just sufficient to reimburse (indemnify) the transferor for its costs accruing in supplying a certain product or commodity to the transferee, and is therefore the *minimum* price at which the transferor can agree rationally to such a transaction.[2]

The transfer pricing *GR* is almost always illustrated in textbook problems involving manufactured goods. Whether the *GR* applies as well to pricing transfers of services as of goods is not raised. Perhaps this does not appear to be an issue, since goods and services are merely different forms of products or "economic goods", and should therefore, it might seem, be costed and priced all by the same criteria or logic. The purpose of this paper is to demonstrate that the transfer pricing *GR* is indeed sufficiently general to allow for typical services transfer contexts, provided that within such contexts "foregone contribution" (see (1) above) is interpreted with regard to the replacement (outsource) cost of the resources (service hours) transferred, a requirement which does not arise in the more familiar application of the *GR* to transfers of goods as opposed to services. This interpretation implies an extension of (1), and can therefore be seen as a generalisation of the GR.

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[1]Some history of this rule is provided by Benke and Edwards (1980, p.11) and Benke et al. (1982, p.43). Formulated by Cook (1955), the "general rule" became known by this name through the influence of early editions of the text by Horngren (e.g. Horngren 1977, p.683). The current edition of Horngren et al. (1994, p.875) uses the description "general guideline" rather than "general rule", so as not to give the impression that there is a definitive or uniquely correct basis for transfer pricing. Other references on the "general rule" are provided by Grabski (1985, pp.50-1), who categorises this rule within the class of "ad hoc" transfer pricing methodologies. Transfer pricing according to the "general rule" is thus distinguished from other approaches which have a formal rather than merely intuitive or "axiomatic" derivation, such as, for example, the results of Hirshleifer (1956) and Kanodia (1979) which are deduced from neo-classical economic models.

[2]For there to be any exchange within a decentralised organisation, between autonomous divisions, the transfer price must be acceptable to both transferor and transferee.

The Minimum Transfer Price of Services

The problem of determining the minimum possible transfer price of services is introduced most easily by way of an example. Consider the case of a law firm which is divided into autonomous profit centres, each dealing with a distinct area of legal practice (e.g. conveyancing, litigation, family law, medical negligence, etc). Suppose that within this firm, the Litigation group finds itself temporarily unable to cope with all its clients' demands and requests the services of another lawyer employed by the same firm within its Conveyancing group. This lawyer, called Ms Jones, is assigned to work briefly for the Litigation group, although her salary is still charged entirely, as usual, to the Conveyancing group. There is thus a transfer of services - but at what minimum price? More precisely, what price is sufficient to compensate (indemnify) the Conveyancing group for its temporary loss of Ms Jones' services, thereby allowing that group to agree to the transaction?

An intuitive, axiomatic or "first principles" response to this question is that the minimum possible transfer price of the services transferred is either (i) the "opportunity cost" of those services, that is, what is lost to the Conveyancing group in terms of fees, or, moreover, contribution margin, or (ii) their replacement cost, whichever is lower. In mathematical terms, the minimum transfer price is thus:

$$\min\{CM, RC\}, \tag{2}$$

where CM is the Conveyancing group's potential contribution margin and RC is the replacement cost of the professional services (labour time) required to generate that contribution (and which normally would have been provided by Ms Jones).

If $RC < CM$, then the Litigation group (transferee) could pay the Conveyancing group (transferor) the amount RC, which would allow the Conveyancing group to contract Ms Jones' "undone" work to another lawyer or firm (by what lawyers call an agency arrangement) and hence generate the same client fees as would have been generated had Ms Jones' services not been transferred. Alternatively, if $RC \geq CM$, the Litigation group would have to pay the Conveyancing group a price equal to its foregone contribution, in order to leave it as well off as if Ms Jones had done her usual work.

Of these two possibilities, it will often be the case that $RC < CM$, since the Litigation group's CM (client fees less incremental job costs such as those of telephone calls, photocopying, travel, disbursements, etc.) will tend to exceed the price RC that

Litigation has to pay to a "locum" standing in for Ms Jones. It is in this case where the familiar general rule, which takes explicit account of *CM* but not *RC*, applies only upon an unfamiliar interpretation of "foregone contribution", one which in effect (see below) measures "foregone contribution" as $\min\{CM, RC\}$ according to (2) above.

Analogy with Deprival Value

Note that the value obtained from (2), $\min\{CM, RC\}$, can be thought of as the "deprival value" of the services transferred. "Deprival value" is a concept from insurance (cf. Bonbright 1937, p.71) according to which an owner deprived of an asset (through theft, for example) is indemnified by a payment equal to

$$\min\{EV, RC\},$$

where *EV* denotes the "economic value" of the asset (measured by the higher of its net realisable value and net present value), and *RC* denotes its replacement cost. By contracting to pay just the minimum of the asset's "economic value" *EV* and replacement cost *RC*, the insurance company is liable for at most the cost of replacing the asset and a lesser amount if the asset is not worth replacing ($RC > EV$). This minimum compensation payment is analogous to a minimum agreeable transfer price, in that it is the least payment the owner can accept without being left out of pocket.

Formal Rules

The intuitive argument above can be generalised as follows. Suppose that the transferor provides services of type y to the transferee, taking the time of a particular employee which would otherwise have been in use producing services of type x for external clients (where x and y can be the same). The minimum transfer price of services y is given by:

$$ic_y + \min\{CM_x, RC_x\} \qquad (3)$$

where:

RC_x = the replacement cost of the professional time transferred, this being time sufficient to produce services x.

ic_y = the incremental cost (to the transferor), not including RC_x, of the services y transferred (in the law firm example, Ms Jones may incur incremental job costs such as telephone calls, etc. charged to her usual account number, and

thus appearing in the accounts of her usual employer, Conveyancing, rather than against Litigation on whose behalf she is currently working).

CM_x = the contribution margin from services x (i.e. fees less incremental job costs ic_x; e.g. telephone, etc.) which *would have* accrued to the transferor had the transfer not occurred.

Note that (3) is merely the "deprival value" (2) with the obvious addition of ic_y so as to allow for any incremental job costs incurred by the transferor "on behalf of" the transferee. The intuitive basis for (3) is otherwise as explained in the section above.

Idle Capacity. If the time used in providing y would otherwise have been idle, CM_x is zero (as is RC_x) and (3) becomes simply ic_y.

Insufficient (or Zero) Idle Capacity. If the time used in providing services y would otherwise have been used in providing services x to external clients, then in general the needs of these clients will be met only if the time required is replaced (bought in) at cost RC_x. The minimum transfer price of y is in these circumstances given by (3).

It follows from (3) that when $RC_x \geq CM_x$, the minimum transfer price of y is

$$ic_y + CM_x. \tag{5}$$

This is explicitly as per the usual general rule (1) since ic_y is the incremental cost of the services y transferred and CM_x is the contribution foregone through diversion of resources away from external clients (services x) toward the transferee (services y).

When $RC_x < CM_x$, the minimum transfer price (3) becomes

$$iCy + RC_x, \tag{6}$$

which unlike (4) and (5) is not a familiar outcome of the GR, but can be reconciled with that rule without much difficulty (see below).

Allowing now for the case when the services y transferred are the same (in both type and quantity) as those services x which would otherwise have been provided to external clients (i.e. $x=y$), then for $RC_x \geq CM_x$ the minimum transfer price (5) becomes

$$ic_x + CM_x,$$

which equals

$$ic_x + (P_x - ic_x) = P_x, \tag{7}$$

where P_x is the price at which services x could be sold (to external clients) and ic_x is the incremental job cost of those services x (see definition of ic_y above). This is the usual "full capacity" outcome of the *GR*.

Similarly, for $RC_x < CM_x$, the minimum transfer price (6) becomes

$$ic_x + RC_x, \tag{8}$$

which represents the incremental job cost of the services x ($=y$) transferred plus the cost RC_x of replacing (buying in) the professional time required to produce those same services.

Example of Replacement Cost Based Transfer Pricing

An example problem in which the unconventional, replacement cost based formula (6) gives the appropriate minimum transfer price occurs in my own work place. Here faculty employed in the Department of Accounting and Finance, which is responsible for graduate and undergraduate programs majoring in those disciplines, are sometimes co-opted to teach in classes offered by the MBA Program, a separate and autonomous profit centre. Some of this teaching is done "on load", which means that it is part of the staff member's normal teaching load ("off-load" teaching is done outside the staff member's salaried employment and is paid at a figure agreed between that person and the MBA Program Director). Teaching services provided "on-load" amount to a transfer of services from the Department of Accounting and Finance to the MBA Program. Sometimes these services can be quite adequately replaced, to the extent (number of teaching hours) that transfers are considered, by a part-time or "casual" employee. In these circumstances, the usual "book rate" paid by the University to nearly all part-time staff is, from the Department's viewpoint, an acceptable (albeit barely acceptable) transfer price.[3]

[3]In addition, as per (6), the Department requires reimbursement of any incremental job costs (e.g. telephone, photocopying, etc.) incurred in fulfilling its service commitment.

In another actual transfer arrangement, the Department of Accounting and Finance buys teaching services from the Department of Applied Statistics at the part-time teaching rate. This is an arrangement whereby a particular staff member trained as a theoretical statistician wishes to develop a research interest in corporate finance. Both Departments benefit from the transfer of her services. The Department of Accounting and Finance finds someone very able in the mathematical aspects of finance, and the Department of Applied Statistics provides one of its staff with the opportunity to tool up in an important applied research area. At a transfer price equal to the part-time teaching "book rate", neither Department is out of pocket. The Department of Applied Statistics gets its teaching done competently, or more than competently, at that rate (often by one its PhD students) and the Department of Accounting and Finance does the same.

Reconciliation with the General Rule

The formal rules (3)-(8) above, all derive from an intuitive premiss (2). Except for (6), and its corollary (8), these rules are just as would arise from application of the *GR*. Although (6) is less familiar, it can be reconciled with the *GR*, if, in the case where $RC_x < CM_x$ (to which (6) applies), the transferor's "foregone contribution" is interpreted as RC_x. In effect this is true, because when $RC_x < CM_x$ the transferor of y can rationally "buy in" at cost RC_x the work x which would otherwise go undone, and then proceed, just as it would otherwise, to sell that work to clients, yielding a contribution CM_x more than sufficient to meet its added cost RC_x. In effect, therefore, all that is foregone (i.e. what contribution margin the transferor loses by supplying service y to the transferee) is just its added cost RC_x, and hence by the *GR* (1) the minimum transfer price of services y is $ic_y + RC_x$ as per (6).

This is so, of course, only for $RC_x < CM_x$. If $RC_x > CM_x$, the transferor's foregone contribution is just CM_x (a price of RC_x would overcompensate for this loss). In either case, therefore, the contribution foregone is the lower of CM_x and RC_x, as described by (2), and hence (3) is completely general. Indeed (3) can be seen as a "more general" form of the usual "general rule".

The Difference Between Goods and Services

Although (3) is a "more general" general rule, its added generality is useful in services contexts rather than in relation to transfers of goods. This is because replacement cost does not have the same relevance to the transfer price of goods as it does to services.

When services are transferred, the transferor will sometimes be content, in fact more than content (see below), with a price sufficient to pay a "locum", that is to replace the service time transferred. Indeed, the first thoughts of the transferor when negotiating a transfer price will often be of the replacement cost (e.g. daily outsource rate) of the professional time being transferred. Reference to replacement cost is not so immediate or natural with goods. By (3) above, it is only when the potential contribution margin *CM* of what is transferred is greater than its replacement cost *RC* that *RC* is relevant. However, with goods, unlike services, the transferor is in general unlikely to see a replacement cost *RC* as sufficient to compensate for a possible contribution *CM* which exceeds that cost. Moreover, replacement (outsourcing) is generally not a consideration when the transfer is of goods rather than services. Several factors explain why replacement is a natural consideration with services but not often with goods:

1. There is usually no equivalent in goods markets of the availability of contract professional service time on an hourly, daily or other highly flexible labour rate. When goods are transferred, they cannot be immediately replaced, in whatever small or large quantity, with essentially no transaction costs (e.g. freight, insurance, handling etc.). By comparison, temporary or replacement professional services, contracted by the hour or by the year, are often just "a phone call away".

2. Goods are often customised and hence not something which the transferor can replace "off the shelf". Services are more adaptable and hence in effect quite "generic". For example, the services of a competent legal secretary are largely substitutable for those of another, whereas standard "Brand X" washing machine motors will not do the job of high efficiency, heavy duty "Brand Y" motors designed to order.

3. Services are more than merely substitutable, they have a chameleon like character which enables them to be whatever they need to be to meet users' immediate needs. For example, Ms Jones can apply her time to doing conveyancing or she can "change hats" and do litigation work in that same time. Similarly, a member of university faculty can teach statistics, or she can teach finance, and will do either without difficulty depending on who (which Department) she is working for at the time. By comparison, when goods are transferred, they are the same goods in the hands of the transferee as in the hands of the transferor. A shipment of washing machine motors cannot become a shipment of alternators, or even of higher rated motors, regardless of the transferee's current needs. Like most other goods, motors have inherent physical

specifications which are practically unchangeable. Services, however, are of one type when employed by the transferee and typically another type altogether when redirected to the transferee and oriented to its particular needs. The transferee does not acquire (or desire) the same commodity as the transferee gives up. Once transferred, teaching services in the subject "Introductory Statistics" become teaching in the finance subject "Investments", and hours spent on conveyancing become hours of litigation, neither with significant, if any, "energy loss".

This difference between goods and services is perhaps what most explains the peculiar relevance of replacement cost to the transfer pricing of services. When services are transferred, the transferee has only to replace what it gave up, not what the transferee received. For example, when the Department of Accounting and Finance buys in teaching time from the Department of Applied Statistics, the latter department has only to replace its foregone statistics class time. This is despite the fact that by way of the transfer the Department of Accounting and Finance obtained class hours in a different subject matter, namely finance, which may have a much greater cost at current market prices. There exists, therefore, a kind of arbitrage opportunity. The transferor can sell commodity y and replace it with a less expensive commodity x, without being any worse off for the switch. If there is a tradeable difference between the market prices of x and y, then a transfer arrangement can benefit both parties. For example, if highly competent teaching in statistics is much less costly than highly competent teaching in finance, then the Department of Applied Statistics can sell class hours to the Department of Accounting and Finance for a price somewhat greater than it pays to replace its foregone statistics class hours, yet less than would be paid by Accounting and Finance to buy such competent finance class hours on the outside market.[4] That is, a transfer price between a minimum given by the replacement cost of what is foregone (see (6) above), and a maximum given by the market price of what the transferee acquires, is rationally agreeable to, and will benefit, both parties.

4. A further reason for the ready consideration of replacement cost in services contexts is to do with the salaried (large fixed cost) and varied nature of professional

[4]This is in fact what occurs in my University. The Department of Applied Statistics sells teaching time to the Department of Accounting and Finance at a price equal to its replacement cost plus a small "profit". Both parties are content with this transaction, although there is the suspicion that Accounting and Finance is a bigger winner than Applied Statistics, since it is getting highly competent teaching at much less than prevailing market price. The other view is that Applied Statistics is bound to pay the salary of the its faculty member anyway (because she is both tenured and indispensable) and the "profit" element in the transfer price is therefore an "unnecessary" contribution by Accounting and Finance toward what is a fixed and unavoidable (sunk) cost.

service work. Consider, for example, an academic who is paid a salary of $100,000 per year for teaching, research and other related services. Of this person's teaching, one class in particular is very specialised and can be done only or best by him (of all available staff). His other class time presents more "routine" demands and can be replaced quite adequately at hourly rates by PhD students or academics from other institutions. Now suppose that a research institute proposes to "buy out" some of this academics teaching time, so as to free his services up for research. At what rate should this time be transferred? The minimum rate which the transferor (Faculty Dean) is able to accept is the hourly replacement rate of the academic's lower level teaching. His salary (a much higher rate when expressed by the hour) is irrelevant, since (i) in the short term it is sunk, and (ii) in the long term it is paid to hold him, rather than to have him teach lower level classes. Indeed, if his attraction is his research, then it may be of great benefit to all parties to have his less specialist teaching done at outsource rates thereby allowing more of his services to transfer to the research institute.

Conclusion

It is common in services environments that professional labour time can be "bought in" or, equivalently, specific jobs "contracted out". In these circumstances it is necessary that intra-firm service transfers be priced in relation not only for the usual notion of "foregone contribution" but also with regard to the replacement cost of the service time transferred. More specifically, if the time transferred (had it not been transferred) would have yielded a contribution margin of $100, and yet could be replaced (outsourced) at a cost of only $40, then the minimum possible transfer price is just $40. With this amount the service provider can "replace" or make up the time transferred and thus still earn the potential $100 contribution margin. There is, therefore, no contribution ultimately foregone by the service provider (transferor) apart from the cost incurred in hiring replacement professional labour time. This is so provided that the replacement cost *RC* of the services transferred is less than their potential contribution *CM* to the transferor. Once it becomes uneconomic to buy the required labour time ($RC > CM$), the service provider's foregone contribution can no longer be reduced to replacement cost.

The notion that a transfer price equal to replacement cost may satisfy the transferor is peculiarly relevant to services. In services contexts it makes sense, and is commonplace, that time transferred between autonomous sub-entities is replaced by temporary employment of a "locum" or sub-contractor. Indeed it may be more than acceptable to the transferor division that the transferee pays a price just sufficient to

cover replacement labour time. With this price, the transferor may hire someone idealy suited to the work at hand. If at the same time the individual whose time is transferred happens to fit the transferee's needs similarly well, then both parties, and the firm as a whole, will be better off.

Mutually agreeable transfers of services are often a possibility, particularly when the service time transferred represents different things to the transferor and transferee. For example, if one section of a law firm is involved in mainly "routine" low margin work, a type of work which can be outsourced at low cost, and another section is temporarily overloaded with some kind of more specialist or high margin work, then there are obvious grounds for transferring the services of an attorney capable of both types of work but normally employed within the lower margin activity. From the viewpoint of the firm as a whole, it is cheaper to outsource routine work than specialist work, and, from the viewpoint of the transferor section, any transfer price greater than its relatively low outsource rate (replacement cost) will provide a contribution which would not be earned if no transfer occurred. This rate, at which a "locum" or "agent" can be contracted to do the work of the attorney transferred, is the minimum acceptable transfer price. The maximum agreeable price is determined by the transferee, and depends, more conventionally, on what rate it would have to pay on the outside market for the same services and the contribution margin available to it from the work on offer. It may be that given the available contribution margins, the transferee cannot quite afford to buy in its own "agent" at external market rates, but can afford to pay a transfer price for the necessary specialist services appreciably greater than the transferor section would have to pay its agent. There is then the opportunity of significant mutual advantage.

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