

# Negotiation advantages of professional associations in health care

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## Abstract

In several instances, third-party payers negotiate prices of health care services with providers. We show that a third-party payer may prefer to deal with a professional association than with the sub-set constituted by the more efficient providers, and then apply the same price to all providers. The reason for it is the increase in the bargaining position of providers. The more efficient providers are also the ones with higher profits in the event of negotiation failure. This allows them to extract a higher surplus from the third-party payer.

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# 1 Introduction

The simultaneous existence of a public financing entity (third-party payer) and private providers of health care motivates the existence of contracts governing the relationship between the third-party payer and the providers.

A popular contractual form is the setting of fee for service - the financing institution pays a pre-determined amount for a given service per each patient treated. Despite a general trend towards different contractual forms, in some countries and for certain services provided this approach is still dominant.<sup>1</sup>

One such example is the Portuguese dialysis sector, although the principle we highlight is general and applies to many other circumstances. In Portugal, a National-Health-Service (NHS) type of health system is in place.<sup>2</sup> The public sector is clearly unable to treat all patients suffering chronic renal insufficiency. Thus, resorting to the private sector has been essential for patients to access health care. The Portuguese NHS has, however, the financial responsibility over the care provided to these patients. Hence, the NHS contracts with the private sector the value to be paid by dialysis session done. This is likely to remain the main payment system in the future, although some reform proposals for the financing mechanism have been put forward by the private sector.

Besides dialysis, other medical specialties and diagnostic exams are paid according to the same system. Typically, the value of this fee is set in a negotiation procedure between the NHS and an association representing providers. The case of dialysis provision is, however, different. Two providers gained considerable market share and reached a position of market dominance. There is no precise information available on the number of patients treated by each company. Publicly available estimates point to the two largest companies having about two-thirds of the existing clinics in the country. Currently, there are 26 NHS hospitals able to provide dial-

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<sup>1</sup>See Mossialos and Le Grand (1999, pp.17–19) for a review of payment systems for health care providers in the European Union.

<sup>2</sup>For a recent overview of the Portuguese health care system, see European Observatory on Health Care Systems (1999).

ysis treatment, while there are 63 private clinics. The private providers are essential to the health system, as NHS hospitals devote their capacity to acute patients that are in the hospital for other reasons (or for kidney transplant) but still need to do their dialysis sessions. Since they also have the ones with largest capacity, it is reasonable to expect that about 70% of the patients are served by these two companies. The remaining private market is served by a number of smaller companies, with several cases of one company – one firm. Moreover, the two largest providers are vertically integrated multinationals, operating at lower marginal costs. Acquisition of equipment and consumables is made at internal transfer cost (which for our economic analysis corresponds to marginal cost pricing), while smaller companies have to buy on the market. Since the market is not perfectly competitive, they pay inputs above marginal cost. Thus, they are a cost disadvantage relative to vertically integrated multinationals. Currently, the NHS negotiates the price of a dialysis session with the two largest companies and extends the agreed price to all companies. The association of the providers is actually run by representatives of these two companies. Thus, even though the association performs the negotiation, it has been accused of serving only the interests of the two major companies. Also, there were accusations of side negotiations with the largest companies. We can see this situation has having the NHS negotiating only with two largest companies.

The interesting economic question here is whether the NHS would do better negotiating with an association instead of selecting the two largest companies as preferential partners. At first sight, a negotiation with the largest companies, which are also more efficient in production, may lead to lower prices. These firms can accommodate lower prices due to the smaller production costs. Negotiating with an association would mean that the interests of smaller, inefficient, companies would be considered, driving prices up-

This view, however, neglects that the more efficient companies may be tougher negotiators, and thus obtain a better price, which is extended afterwards to all other companies. The bargaining strength comes from the

fallback value in case of failure in negotiations. Assuming that patients will be treated, even if at cost of direct payments, the more efficient companies will have relatively higher profits. Thus, they will be more demanding in negotiations than a sectoral association, because the latter takes into account the relatively low profits of the less efficient companies. Consequently, if the association is willing to concede a less favorable surplus division to avoid failure of negotiations. Therefore, the negotiation with the more efficient firms may benefit all the providers and lead to higher expenditure by the NHS.

The argument is, naturally, dependent on the assumption made about the event of negotiation failure. If, alternatively, we assume that patients will not be treated (at least, by these providers), then the reinforcement of bargaining power of providers associated with the negotiation procedure including only the more efficient ones does not exist. It just remains the first effect: more efficient firms are more willing to take lower prices. In this case, the NHS benefits from negotiating with the more efficient providers only, instead of doing it with a sectoral association. In our motivating example, the nature of the disease justifies the presumption that patients will be treated even if at own-pocket payment (chronic renal insufficiency if not compensated by dialysis or a kidney transplant leads to death). Thus, we conclude that the NHS should negotiate with a sectoral association and not with the more efficient, largest, providers.

The next sections are devoted to the formal exposition of the argument. The second section shows that without asymmetries, it is irrelevant whether the negotiation is done with the a subset of companies or with an association. The third section introduces cost asymmetries and establishes our main result. Next, the fourth section shows the result to be reversed if patients are not treated in the event of negotiation failure. Finally, section five presents some concluding remarks.

## 2 The model

We consider a setting where a third-party payer, say a National Health Service (NHS), has to negotiate prices of health care services with the providers. We assume, for the moment, zero production costs in the provision of health care and the existence of two providers. This assumption is relaxed in a later section.

Price negotiation can be done under two different regimes. In the first one, the providers join a sectoral or professional association. The association negotiates the price with the NHS. In the second regime, the NHS negotiates the price with the provider and extends the agreed price to the contract involving the other provider. In particular, when cost asymmetries exist we assume the NHS to negotiate with the more efficient provider. This assumption and its implications are discussed in the final section. The negotiation process is described by the Nash bargaining solution.<sup>3</sup>

In case of failure of to reach an agreement, both providers compete in the market. We assume providers to be characterized by horizontal product differentiation at the eyes of the consumer. The differentiation can be due to geographical distance and/or to subjective preferences of the consumer, for example. This means that we model market interaction as a Hotelling product differentiation situation. Providers are located at the endpoints of a segment  $[0,1]$ . Consumers are uniformly distributed along the line, with mass 1.

The NHS has value  $R$  from which it must pay providers. Having free funds is positively valued by the NHS as it allows for its productive application elsewhere in the health sector. We interpret  $R$  as net of the fallback value for the NHS in case of negotiation failure. We assume  $R$  to be high enough to pay all care demanded by consumers.

Denote by  $\Pi_i, i = 1, B$  the profits of each provider and by  $\bar{\Pi}_i, i = A, B$

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<sup>3</sup>Extensive presentations of the non-cooperative bargaining theory are Binmore et al. (1986), Osborne and Rubinstein (1990) and Roth (1985), among others.

their profits in the case of negotiation failure. Profits are then given by

$$\Pi_A = xp_A, \Pi_B = (1-x)p_B, \quad (1)$$

where  $p_i, i = A, B$ , is the price received by each provider and  $x$  is the indifferent consumer between the choice of provider  $A$  and of provider  $B$ . This indifferent consumer is defined by

$$x = \frac{1}{2} - \frac{p_A - p_B}{2t} \quad (2)$$

The parameter  $t$  reflects product differentiation, and it is modeled as the “transport cost” of not consulting the most preferred type of provider.<sup>4</sup>

According to our assumptions, when the NHS negotiates with an association that takes into account the interests of both players, the equilibrium price,  $p$ , is the solution to the following program:

$$\max_p \Omega = (R - \Pi_A - \Pi_B)^\delta (\Pi_A + \Pi_B - \bar{\Pi}_A - \bar{\Pi}_B)^{1-\delta}, \quad (3)$$

where  $\delta$  denotes the bargaining power of the NHS ( $\delta \in (0, 1)$ ). It is easy to check that  $\Pi_A + \Pi_B = p$  and  $\bar{\Pi}_A + \bar{\Pi}_B = t$ . Thus, the first-order condition of the above program can be written as:<sup>5</sup>

$$-\delta(p - t) + (1 - \delta)(R - p) = 0 \quad (4)$$

Thus, the equilibrium price is:

$$p^* = \delta t + (1 - \delta)R \quad (5)$$

Consider now the case where the NHS negotiates with, say, provider  $A$  and applies the resulting price to provider  $B$  as well. The program to be solved is:

$$\begin{aligned} \max_p \Omega &= (R - \Pi_A - \Pi_B)^\delta (\Pi_A - \bar{\Pi}_A)^{1-\delta} = (R - p)^\delta (p/2 - t/2)^{1-\delta} \\ &s.t. \quad \Pi_B \geq 0 \end{aligned} \quad (6)$$

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<sup>4</sup>See Hotelling (1929) or a textbook treatment such as Tirole (1988).

<sup>5</sup>It is straightforward to check that the second-order condition for a maximum of this program holds.

Note that although the NHS negotiates with provider  $A$  only, it takes into account that the same price will apply to the other provider. A further requirement is that provider  $B$  makes non-negative profits. Thus, market demand will be equally split. The above expression makes already use of profit definitions. It is clear that it yields the same solution of the first program. Since firms are symmetric, any price that gives non-negative profits to provider  $A$  also ensures the constraint to be satisfied. The negotiation will, in fact, give strictly positive profits to both providers. Thus, under symmetry of providers, the NHS and providers are indifferent between the two alternative procedures. The next section departs from this symmetric world.

A side point to note here is that under negotiation providers always earn more than in the standard private market equilibrium. One can then question why does the third-party payer exist in the first place. To answer the question, remember that health care demand is, at the beginning of a period, stochastic. This leads directly to insurance demand and to an active role for third-party payers. Moreover, the value of insurance (either publicly or privately provided) exceeds that of health care provision, leaving some surplus to be shared between the third-party payer and providers. In the case of chronic conditions, the main argument for a third-party payer is an equity one, as well, at least in NHS-like health systems. People should not be forced to pay the full costs of their treatments for solidarity reasons. Some patients may lack the financial means to access the health care they need in a pure private health care market. The health financing system provides insurance coverage against the event of having a chronic condition. In either case, we find justification for  $R$  greater than the providers' equilibrium profits in a private market, and therefore for a negotiation dividing the available surplus.

### 3 Negotiating with asymmetric providers

We now assume that provider  $A$  is more cost efficient. Provider  $B$  has a production cost  $c$  per patient treated. Now, the equilibrium in a private market without a third-party payer is not symmetric. It is characterized by

$$p_A = \frac{c + 3t}{3}, p_B = \frac{3t + 2c}{3} \text{ and } \bar{\Pi}_A = \frac{(c + 3t)^2}{18t}, \bar{\Pi}_B = \frac{(3t - c)^2}{18t}. \quad (7)$$

The above profits define the fallback values for the providers in case of negotiation failure.

When the NHS negotiates with sectoral/professional association, the equilibrium solves the following program:

$$\max_p \Omega = (R - p)^\delta \left( p - \frac{c}{2} - \frac{(c + 3t)^2}{18t} - \frac{(3t - c)^2}{18t} \right)^{1-\delta} \quad (8)$$

Solving the first-order condition yields the equilibrium price:

$$p^+ = (1 - \delta)R + \delta \left( \frac{c}{2} + \frac{(c + 3t)^2}{18t} + \frac{(3t - c)^2}{18t} \right) \quad (9)$$

Equilibrium profits are given by

$$\Pi_A = p/2; \Pi_B = (p - c)/2. \quad (10)$$

Consider now the negotiation with the more efficient provider, which is also the largest one. The price determined by the negotiation applies to both providers. The program to be solved is:

$$\begin{aligned} \max_p \Omega' &= (R - p)^\delta \left( \frac{p}{2} - \frac{(3t + c)^2}{18t} \right) \\ \text{s.t.} & \frac{1}{2}(p - c) \end{aligned} \quad (11)$$

Let's consider, first, the problem without the constraint of non-negative profits for provider  $B$ . Afterwards, we will show that provider  $B$  has strictly positive profits as well.

The first-order condition leads, after manipulation, to the following equilibrium price:

$$p' = (1 - \delta)R + \delta \frac{(c + 3t)^2}{9t} \quad (12)$$



We know, from the bargaining process, that the equilibrium price must be such that

$$p > \frac{(3t + c)^2}{9t} \quad (13)$$

Thus, if

$$\frac{(3t + c)^2}{9t} - c > 0 \quad (14)$$

holds, then provider  $B$  makes strictly positive profits. This condition can be rewritten as:

$$c^2 + 3t(3t - c) > 0 \quad (15)$$

In the private market equilibrium, prices must cover costs. Thus, from (7), we require  $3t - c > 0$ . Hence, condition (15) always holds and the non-negative profit constraint in problem (11) is not binding in equilibrium.

It is straightforward to see that

$$p' - p^+ = c/6 > 0. \quad (16)$$

Thus, the price is higher than when the NHS negotiates with an association. Since a uniform price is set in both cases, demand is evenly split between the two providers, and both earn higher profits if the NHS negotiates with the more efficient one.

The result derives from the tougher position taken by the more efficient provider. Since it is relatively more efficient it has less to lose in the event of negotiation failure. This drives the price up, and more than compensates the downward effect of lower costs of production.

This implication is consistent with the observed facts. In the Portuguese dialysis sector, the NHS negotiates prices for each dialysis session with the two largest providers. The price settled in this agreement is then applied to all companies. Surprisingly enough, the smaller companies have not been claiming for a role in the price-determination process. Given that it is reasonable to assume the largest providers to be the more efficient ones, as they are subsidiaries of vertically integrated multinationals, our model presents an explanation for the current happiness of all firms with the status quo.<sup>6</sup>

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<sup>6</sup>Although you find some complaints in press, firms have not taken any real decision to change matters.

All firms benefit from the tougher position of the largest firms, compared to what would be the stance of an association that includes all providers.

## 4 Providers without outside option

To see that the main effect comes through the bargaining position induced by a better fallback value, consider the following alternative situation in case of negotiation failure: the NHS is able to totally divert patients to other treatment alternatives.<sup>7</sup> In terms of the negotiation process, this means that negotiation failure leads to zero demand for both providers. In this case, the fallback value for both providers is zero. Computations similar to those in the previous section show the equilibrium price to be, when the NHS negotiates with an association,

$$p^+ = R(1 - \delta) + \delta c/2, \quad (17)$$

while the equilibrium price if the NHS negotiates with the more efficient provider is:

$$p' = R(1 - \delta). \quad (18)$$

And it follows directly that

$$p' < p^+. \quad (19)$$

From the point of view of the third-party payer, it is better to negotiate with the more efficient provider and apply that price to the second provider. The result reverses that of the previous section. The crucial difference is that, in the latter situation, shifting from a negotiation with an association to a negotiation with the more efficient provider does not change the fallback value of providers in case of breakdown in negotiations. The mechanism that weakened the position of the NHS does not exist here.

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<sup>7</sup>This is done possibly at a higher cost. If this is so, the value  $R$  can also differ to the previous case. In particular, it would be higher in the current section than in the previous one. Such a case would strengthen our case of Section 3. The price comparison of equation (19) below would not be clearcut.

## 5 Concluding remarks

In this note, we addressed a simple, but economically significant, question: should a NHS (or a third-party payer, in general) negotiate prices of health care services with professional associations, or should it negotiate only with the more efficient ones and apply the resulting price to all providers? The first alternative has been common, but the second one can also be found in the health care sector.

We showed that the apparent benefit of negotiating with the more efficient providers – obtaining lower prices – can be more than outweighed by a stronger bargaining position of the provider, when compared to an association. This is so because a representative association incorporates in its decisions also the (relatively larger) decline in profits of the less efficient firms in the event of negotiation failure.

In the context of the motivating example, the clear policy implication is that the Portuguese NHS should avoid to negotiate with the largest providers in the dialysis market. Instead, it should promote negotiations over prices with an association representative of all providers' interests. According to our findings, all providers benefit from the partial negotiation. So, the association will not take over price negotiations without pressure from the NHS for that to happen.

Some caveats to the model need to be presented. Given our results, it is tempting to draw another policy implication. By reversing the argument, the NHS should attempt to negotiate with the less efficient providers and then apply this price to all providers. Such procedure, however, seems to be quite difficult to implement in political terms, especially if the less efficient providers are also the smaller ones in the market. In addition, if the inefficiency is large enough, a too high price may result anyway. Thus, considering that the NHS has the option to negotiate with the more efficient/largest providers seems the more reasonable one.

Another assumption deserving discussion is that only one negotiation is done. Alternatively, one could think of a sequential bargaining procedure.

In such a case, the NHS would negotiate first with one provider and then with the other. We preclude this as typically price discrimination on the fee per session is seen as undesirable and usually faces strong opposition by providers. Also, conducting sequential negotiations adds considerably to transaction costs. The settlement of prices may take several months and involves use of real resources by both parties. Taking together these two elements, we find reasonable to assume that only one negotiation takes place and the resulting price applies to all providers.

Summarizing, whenever a third-party payer negotiates prices with providers, it will do better by doing it with an association inclusive of all providers if the providers are asymmetric in production costs and face valuable outside options, in comparison with negotiating with a set of the more efficient providers. This finding reassesses the role for professional associations in price determination processes, at least in some health care markets.

## References

- Binmore, K.G., A. Rubinstein and A. Wolinsky, 1986, Non-cooperative models of bargaining, in *Handbook of Game Theory with Economic Applications*, edited by R.J. Aumann and S. Hart, Amsterdam, North-Holland.
- Brooks, J.M., A. Dor and H.S. Wong, 1997, Hospital-third-party payer bargaining: An empirical investigation of appendectomy pricing, *Journal of Health Economics*, **16**, 417-434.
- European Observatory on Health Care Systems, 1999, *Health Care Systems in Transition – Portugal*.
- Fingleton, J. and M. Raith, 2000, Open covenants, privately arrived at, mimeo.
- Hotelling, H., 1929, Stability in Competition, *Economic Journal*, **39**: 41 – 57.
- Mossialos, E. and J. Le Grand, 1999, Cost containment in the EU: an overview, Chapter 1 in Mossialos, E. and Le Grand, J., editors, *Health care and cost containment in the European Union*, Ashgate Publishing Limited.
- Osborne, M.J. and A. Rubinstein, 1990, *Bargaining and markets*, San Diego, Academic Press.
- Roth, A.E., 1985, *Game-theoretic models of bargaining*, Cambridge (Mass.), Cambridge University Press.
- Tirole, J., 1988, *The Theory of Industrial Organization*, The MIT Press.