
21 Models of negotiation and bargaining in health care

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1. Introduction

Under traditional health insurance arrangements, citizens were covered by some insurance scheme. When sick, insurance arrangements allowed citizens to go to a health care provider, pay the price of the care received and be reimbursed later. Alternatively, the care provider would be owned by the insurer (like in integrated national health systems) and the patient paid nothing at the moment of consumption. In such arrangements, providers would freely set their prices or have no price to set at all (in an NHS-like system).

Recent developments in health care financing include independent institutions that negotiate the prices with the financing institution. This is true with respect to health maintenance organizations (HMOs), managed care in general, but also in national health systems where decentralization and the split between provision and financing is implemented.

In this scenario, negotiation over contractual terms, including prices as one major element, becomes a relevant issue in the analysis of performance of health care systems. Both empirical and theoretical analyses have been produced, and are reviewed below.

This chapter reflects our views and preferences. It does not aim to be an encyclopaedic view of the existing literature on bargaining in health care. Instead, we try to highlight the new developments associated with explicit bargaining between third-party payers and providers of health care (a relation which is, in itself, only one of many that exist in the health care sector).

Bargaining theory has a long tradition in the economics literature. However, it is only recently that this approach has found space in the analysis of the health care sector. The recognition of the strategic interaction among agents in the health care sector (patients, providers and third-party payers) came with the application of models borrowed from the industrial organization tradition dating from the 1970s. It was in the early 1990s when a step forward was taken with the eruption of the models of bargaining (see for example, Osborne and Rubinstein, 1990, for a nice presentation) In many situations the health care sector has the structure of a bilateral monopoly/oligopoly. In this context, bargaining becomes the natural way to approach the interactions among agents.

Most economic analyses of contract design in health care in fact assume that the party that moves first, typically the payer, proposes a take-it-or-leave-it offer to the provider. We take here a broader view, looking at other types of negotiation procedures. We do not discuss issues related to contract design, which are taken up in chapter 22 by Chalkley in this *Companion*.

We focus here on models of explicit bargaining between two parties, which we call *the payer* and *the provider*. On theoretical grounds, simple bargaining models can have their results transposed in a straightforward way: higher bargaining power and higher

alternative-option values ('outside options') from providers generate higher prices. Therefore, a first empirical question is: how strong are providers? In other words, financing institutions (payers) are usually large relative to providers. However, providers may in turn have natural exclusive 'catchment areas' (in geographic terms or medical specialty), thus balancing the negotiation strength. Then, what is the effect on prices from moving to an explicit bargaining situation? This being a relevant question, it is certainly not the only one. The special setting of health care markets brings to attention the optimal design of the negotiation procedure. In particular, the timing and format of negotiations between payers/financing institutions and health care providers may lead to distinct outcomes.

We discuss first the main theoretical background, emphasizing recent work. Afterwards, we review some of the 'small' empirical literature on bargaining in health care. We conclude with directions for future research.

2. Models of bargaining in health

The basic model has a single third-party payer bargaining with a single provider over the division of a surplus S . The Nash bargaining solution is a price p^* that maximizes the product of their gains weighted by the respective bargaining powers. Formally,

$$p^* = \operatorname{argmax}_p V(p)^\delta \Pi(p)^{1-\delta} \quad (21.1)$$

where $V(p)$ is the surplus for the third-party payer ($V'(p) < 0$), $\Pi(p)$ is the profit for the provider ($\Pi'(p) > 0$), and δ is a parameter related to the relative bargaining power of the third-party payer. Whenever the total surplus $S = V(p) + \Pi(p)$ is constant, the Nash bargaining solution entails

$$V(p^*) = \delta S \quad (21.2)$$

Thus, the greater the bargaining power of the third-party payer, the greater the share of surplus they capture. This simple model does not allow for outside options (the result of the non-cooperative game should the players fail to reach an agreement). The Nash bargaining solution has been extended to the situation where the parties have an alternative in case of breakdown of negotiations. Suppose that the third-party payer has an alternative value of \bar{V} and the provider has a profit $\bar{\Pi}$ when negotiations fail. Then, the generalized Nash bargaining solution corresponds to

$$p^* = \operatorname{argmax}_p (V(p) - \bar{V})^\delta (\Pi(p) - \bar{\Pi})^{1-\delta} \quad (21.3)$$

Taking again the case of a fixed total surplus, S , the Nash bargaining outcome implies:

$$V(p^*) = \bar{V} + \delta(S - \bar{\Pi} - \bar{V}) \quad (21.4)$$

That is, the third-party payer is assured of its outside option value, \bar{V} , plus a share δ of the total surplus at stake, given by the overall surplus S , deducted from the assured outside option values to each side, \bar{V} and $\bar{\Pi}$. These outside option values also drive the outcome of the bargaining process. In particular, the higher the outside value

of the third-party payer (the provider), the lower (the higher) the equilibrium price will be.

The Nash bargaining solution is the only solution satisfying a set of four intuitively appealing properties. These are: efficiency, symmetry, independence of irrelevant alternatives, and invariance to equivalent utility representations. In the application of this concept to health care context, the patient who can only be given a small health improvement will receive less of the health care budget than a patient with potential to achieve a large health improvement. A useful illustration supporting this solution and other alternatives can be found in Cuadras-Morato et al. (2001).

The empirical papers reviewed below can be interpreted in this simple framework, as they attempt to identify the sources of bargaining power of the third-party payer and of the provider, or the impact of increasing \bar{V} and/or decreasing $\bar{\Pi}$. The theoretical works by Gal-Or (1997, 1999a, 1999b), Barros and Martinez-Giralt (2005a, 2005b, 2008), Milliou et al. (2003) and Fingleton and Raith (2005) elaborate on this bargaining model by providing more structure, mainly to functions $V(\cdot)$, $\Pi(\cdot)$ and \bar{V} , $\bar{\Pi}$. The particular market structures assumed to contextualize the bargaining process allow for the discussion of different aspects. These are the impact of (i) product differentiation across providers and (ii) mergers between providers in the outside values. Gal-Or (1999b) and Milliou et al. (2003) discuss the role of vertical mergers between hospitals and physician practices in increasing the bargaining power of the latter vis-à-vis third-party payers. In Gal-Or (1997, 1999a), Barros and Martinez-Giralt (2005a, 2005b, 2008) and Fingleton and Raith (2005), the interest is in the way the bargaining is organized, which originates different values for these parameters, discussed below.

The next logical step is, in our view, to use the bargaining model to discuss the particular institutional arrangement for bargaining. We focus on price negotiations. Siciliani and Stanciole (2008) broaden the scope of the negotiation to process and activity. Two sorts of choices seem relevant to consider. The first is the choice between the bargaining game and the use of 'any willing provider' (AWP) clauses. These require payers to take into their networks of providers all those willing to accept the terms and conditions of the contract (price, quality, licensing). Also, in some European countries (for example, Switzerland or the UK) we can find the use of AWP dispositions. The second is the choice between negotiating with each provider on a one-to-one basis and negotiating with an association of providers.

Both institutional arrangements can be found in practice. The AWP approach has been debated mainly in the United States, where the enactment of AWP laws by some states (for example, Kentucky in 2003) were taken to the Supreme Court and upheld. Simon (1997) studies the effect of AWP laws on managed care penetration rates and provider participation, and Ohsfeldt et al. (1998) explore the growth of AWP laws applicable to managed care firms and the determinants of their enactment. Empirical work on the implications of the 'any willing provider' laws by Carroll and Ambrose (2002), Morrisey and Oshfeldt (2004) and Vita (2001), have been complemented by the novel theoretical treatment of Barros and Martinez-Giralt (2008). We address the question of how a third-party payer (for example, an insurer) decides what providers to contract with under the AWP mechanism and under a bargaining procedure. The main finding is that the decision of the third-party payer depends on the surplus to be shared. When it is relatively high the third-party payer prefers the any willing provider

system. This is so because the announcement of the terms of the contract constitutes an implicit commitment to be tough. This commitment is more valuable in the case of a bigger surplus. When, on the contrary, the surplus is relatively low, the third-party payer will select a negotiated solution. This imposes further demands on empirical work related to the impact of such laws. It also raises econometric issues: countries, states or third-party payers may introduce them because they fulfil the conditions to get lower prices that way. This endogeneity issue has not yet been tackled in empirical work, to our knowledge.

As to the second issue dealing with the convenience of bargaining with an association, we do find in several European countries examples of centralized negotiations between third-party payers (National Health Services, Health Plans or Insurers) and associations of providers. This question also extends beyond the NHS framework. Around 2005, in the US there was an attempt by democrats in the state Senate and Assembly to pass a bill that would allow health care providers to bargain collectively with health care plans. Barros and Martinez-Giralt (2005b) 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 (able to cope with lower prices), and then apply the same price to all providers. The reason for this 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. From a different perspective, the Medicare Modernization Act of 2003 expanded Medicare allowing private insurers to negotiate drug prices and rebates with retail pharmacies and drug manufacturers, rather than having Medicare negotiate a single price on behalf of all beneficiaries. Lakdawalla and Yin (2009) find that greater concentration among private insurers allows them to obtain lower prices for their members.

In this respect, the general literature on bargaining, mostly with applications to the labour market, provides rationales for providers to join forces and to negotiate as a single entity vis-à-vis the third-party payer. The direct application of most bargaining theory results to health care settings faces a difficulty: the existence of market interaction between participants on one side of the negotiation (*the provider*). This often makes, in health care, the value of one negotiation conditional on the outcome of some other (simultaneous) negotiation(s). Firm–union bargaining issues have similarities, allowing for useful analogies to health care settings. For example, see Gal-Or's (1997) study into the way third-party payers select providers to contract with. She considers two differentiated providers and finds that when consumers' valuation of accessing a full set of providers is small (large) relative to the degree of differentiation between payers, both payers choose to contract with only one (both) of the providers. Petrakis and Vlassis (2000) provide a model of endogenous determination of the firm–union bargaining. According to the relative bargaining power of the unions, they choose to negotiate over wages only or over wages and employment as well. Barros and Martinez-Giralt (2005a) note that a feature present in countries with a National Health Service is the co-existence of a public and a private sector. Often, the public payer contracts with private providers while holding idle capacity. We argue that the public sector may opt to have idle capacity as a way to gain bargaining power vis-à-vis the private provider, under the assumption of a more efficient private than public sector.

Chae and Heidues (2004) point out that when studying negotiations within and across

groups, it is essential to define the preferences of the group. Their analysis provides a theoretical foundation for treating groups as single decision-makers and generalizes the Nash bargaining model. Cai (2004) studies the bargaining structure of a game of complete information where a player bargains sequentially with a number of passive players to implement a project. It turns out that in equilibrium, the probability of the project getting implemented decreases with the number of passive players and their bargaining power. Finally, Stole and Zwiebel (1996a, 1996b) and Wolinsky (2000) examine the effects of union bargaining on employment and other organizational design issues. This line of research is also related to other work, namely by Horn and Wolinsky (1988) and Inderst and Wey (2003). They show that as each supplier acts on the incremental surplus, under decreasing surplus function, doubling the incremental surplus is smaller than the entire surplus, which provides an incentive for providers to join forces and gain bargaining power in input markets.

However, at least equally relevant is to know under which circumstances the third-party payer itself prefers to bargain with an association, or not. This will depend on the change in the outside option value for providers. Barros and Martinez-Giralt (2005b) show that by negotiating with an association, the third-party payer dilutes the outside option value of the more efficient providers. The more efficient providers are the ones that have more to gain from a bilateral bargaining process. The change in their bargaining power, measured by the outside option value can more than compensate for the willingness to take up lower prices due to higher efficiency.

A different line of research proposed by Jelovac (2002) studies the financing of pharmaceutical products in a national health system where negotiations between the public financing agency and pharmaceutical laboratories are affected by the conditions on the demand side, in particular, by the level of co-payments. Also Wright (2004) contributes to this discussion, focusing on the Australian regulation system for drug introduction, and the price bargaining process for new drugs. The regulated pharmaceutical firms manage to extract more of the total additional surplus generated by regulation, thus achieving greater pay-offs than in the absence of regulation.

3. Evidence on bargaining outcomes

Even though explicit negotiations exist in countries with national health services (like the UK and Canada) and with private insurance-oriented systems (like the United States), a crucial difference can be found: in national health services, negotiations often take place between third-party payers (the government or health plans) and professional associations (like medical associations). This sets the negotiation in terms of bilateral monopoly. On the other hand, health maintenance organizations, like the ones that emerged in the United States, use negotiations with providers in a competitive setting. The third-party payer uses the outside option it has, looking for an alternative provider, to put pressure upon providers and obtain lower prices.

There is a recent line of literature looking at the empirical impact of negotiation processes between providers and insurers/third-party payers of health care. The first empirical issue addressed is whether managed care organizations are able to obtain advantageous conditions through bargaining. The debate has one side claiming that lower costs associated with managed care are the outcome of quality degradation, while the other side claims that lower costs are due to the ability of managed care organizations to obtain

lower prices from providers. The existing evidence favours the latter interpretation over the former (see, among others, Cuellar and Gertler, 2006; Cutler et al., 2000; Ho, 2004; Maude-Griffin et al., 2001; Melnick et al., 1992; Sieg (2000)).

Also in the UK NHS, changes in bargaining power seem to have produced visible effects. One of the main policy experiments in the UK, the fundholding GPs (GPs who handle their own budgets), implied an important shift of bargaining power towards GPs, especially those that were fundholders. The empirical research looking at hospital discrimination (favouritism for patients associated with fundholders) can also be used to address the impact of bargaining power shifts. According to Propper et al. (2002), the fundholding GPs were able to obtain lower waiting times for their patients. The ability of GP fundholders to channel money is a reinforcement of their bargaining position vis-à-vis hospitals, and prompted better conditions for the patients of GP fundholders. Thus, understanding 'time' as a sort of *price* in a health system where monetary prices are administratively fixed, the increased bargaining power of GPs, created by the different institutional arrangement (fundholding), has lowered the price/time paid (as a side note, concerns over risk selection issues led to the elimination of the fundholding system to be substituted by primary care groups).

Since lower prices are obtained by payers, a second empirical question arises: the source of the bargaining power of insurers and providers. Theory suggests that size and the existence of outside options do increase a side's bargaining strength. The studies on the sources of bargaining power in health care can be divided into two lines: one looking at the bargaining power of third-party payers; the other one detailing the bargaining power of providers, usually hospitals. On the latter line of empirical research, Brooks et al. (1997, 1998) and Town and Vistnes (2001) look at hospital competition and ownership type as sources of bargaining power. Their findings conform well to what we should expect (see above): competition between hospitals to attract health plans and patients reduces their bargaining power, and lower prices are observed. Moreover, the increased HMO penetration over time was associated with a decrease in hospitals' bargaining power.

With respect to third-party payers, the available evidence suggests that availability of alternatives is a more significant source of bargaining power than size alone. Availability of alternatives means, for health care third-party payers, the ability to channel patients to different providers. Studies by Ellison and Snyder (2001), Pauly (1998), Sorensen (2003), Staten et al. (1988) and Wu (2009) give empirical support to this view. Pauly (1998) noted that size did not preclude small managed care organizations from obtaining significant discounts from hospitals. Sorensen (2003) takes a step further and finds that the ability of third-party payers to direct patients to designated providers has a greater impact than size. Wu (2009) finds that demand elasticity (measured by the patient channelling within the provider network) is even more important than size for the health plans to obtain discounts.

It should also be apparent that some of the theoretical testable predictions are yet to be taken to the data.

4. Directions for future research

Health economics has radically changed its 'toolbox' in the last 25 years. It was the recognition of the strategic behaviour of the agents interacting in the health care sector that

brought the view of the industrial organization field into the analysis. More recently, since the mid-1990s, an explicit recognition of the particular interactions between the different *types* of players (patients, providers and third-party payers) has introduced bargaining theory among the tools of analysis. We have attempted here to provide an overview of the problems tackled so far. Although bargaining theory is widely developed, the health care sector contains enough peculiarities to prevent a direct application of the results already obtained in other sectors, such as, for example, the labour market. Although some efforts to apply bargaining theory to the analysis of the health care sector have already been done, several issues still require intense research efforts.

One relevant dimension is the timing of the negotiation, especially when the payer has to deal with several providers. Then, it may choose to negotiate simultaneously with all interested providers, to do it sequentially (each provider at a time) or to use mechanisms like ‘any willing provider’ clauses. These alternative scenarios have clear implications for the modelling of the information available to the negotiating parties. Also, one should take into account that asymmetric information in negotiation games may reveal information.

The protocol of the bargaining game also has consequences for the capacity of the third-party payer to dilute the bargaining power of providers and thus to bias the outcome of the negotiation. This may, obviously, lead to policy-relevant insights. Along these lines, we can put forward a counter-intuitive conjecture based on Barros and Martinez-Giralt (2005b). This is that allowing entry by efficient providers can be harmful if negotiations are not done under the auspices of an association.

Another issue that, up to our knowledge, has not yet been fully treated is the bargaining over price and (observable) quality. This implies a multi-dimensional bargaining problem. A first step, in the context of drug prices, can be found in Wright (2004), though quality is assessed and not subject to negotiation, in the process of price determination.

Many of the relevant relations between third-party payers and providers are repeated ones, and often bargaining occurs repeatedly over time. How this repeated nature does (or does not) change the bargaining outcome in health care provision is yet to be discussed.

We also feel that empirical analysis of bargaining outcomes in European countries is also warranted, as they occur mostly in the context of bilateral monopoly, with providers organized in professional associations. Of course, we are aware that gathering the relevant information will be a formidable task.

Last but not least, in a somewhat different direction a recent trend in the organization of the health care sector is given by the so-called private finance initiatives (PFI), particularly in the UK, Portugal and other countries. The implementation of these public–private partnership programmes demands a careful negotiation leading to the contract design, and the definition of what is included in the contract of one entity and what remains to the other one. A first analysis along this line is found in Barros and Martinez-Giralt (2009). Also, Martimort and colleagues (Martimort and Iossa, 2009; Martimort et al., 2008) apply principal agent models to PPPs in the transport sector.

Overall, the spreading of instances of explicit bargaining/negotiations between third-party payers and providers should lead to the need of both positive and normative theoretical approaches and further empirical work.

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