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Selecting Negotiation Processes with Health Care Providers

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Selecting Negotiation Processes with Health Care Providers*

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Abstract

We address the question of how a third-party payer (e.g. an insurer) decides what providers to contract with. Two different mechanisms are studied and their properties compared. A first mechanism consists in the third-party payer setting up a bargaining procedure with both providers. The second mechanism is the so-called "any willing provider" where the third-party payer announces a contract and every provider freely decides to sign it or not. 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. When, on the contrary, the surplus is relatively low, the third-party payer will select a negotiated solution.

Keywords: Bargaining, health care provision, Any willing provider.

JEL classification: I12, I18.

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1 Introduction.

A major change in the health care sector worldwide appears in the contractual arrangements between payers and providers of care. Countries with provision of health care organized around explicit contracts, like the U.S., moved from retrospective to more prospective payment systems. Preferential provider arrangements have also been introduced. Countries with a delivery of health care based on National Health Systems seek to introduce some sort of explicit contracting. Again, the definition of a contract implies specification of which organizations enter the contract. Frech (1991) provides an overall account of the elements involved in the design of doctors' fees (see also Charatan (2000)). Moreover, Brooks et al. (1997) documents empirically the importance of bargaining and the evolution of the bargaining position between a third-party payer and a hospital in the case of appendectomy pricing.

An alternative procedure is for the third-party payer to follow an "any willing provider" approach: it announces price and conditions, and any provider that finds them acceptable is allowed to join the network. The empirical relevance of this approach is clear. In the US, "any willing provider" laws have recently been the object of intense debate (and of a Supreme Court decision).[1] Such laws force managed care firms to take into their networks of providers all those willing to accept the terms and conditions of the contract (price, quality and licensing). In the economics literature, we find a couple of relevant studies. Vita (2001) focus on the impact of selective contracting upon costs. More precisely, the effect of any-willing-provider laws ensuring that no selective contracting takes place. The starting point of the empirical test is the hypothesis that "any willing provider" laws increase costs because they reduce the set of available instruments to payers against the alternative that selective contracting creates inefficient risk selection. The inefficient risk selection leads to higher aggregate costs as some people left out will drive cost up by taking the fee-for-service regime. Vita's findings give more support to the first hypothesis than to the second. These results have not been

[1] See ⟨ http://www.supremecourtus.gov/opinions/02pdf/00-1471.pdf⟩.

confirmed by subsequent research. Carroll and Ambrose (2002) report no impact on profitability from "any willing provider" laws. More recently, Morrisey and Oshfeldt (2004) re-examine the issue, including also in the analysis "freedom of choice" laws (which forces managed care firms to pay a fraction of the cost even if patients use a provider of their choice which is outside the selected network of the health plan). They look at market share of health maintenance organizations in markets under different intensity of "any willing provider" laws, finding a negative effect, though smaller in magnitude than "freedom of choice" laws.

In this paper, we address the question of how a third-party payer decides what type of procedure to follow in contracting with providers. We insert this paper in a more general research project analyzing the relationship between third-party payers and providers in the health care market. The interest of this research line lies in the study of mechanisms combining health care insurance contract in a differentiated product setting aiming at the control of the expenditure in the health care sector. We can think of that relationship as the outcome of a three-stage game. In a first stage, the third-party payer (be it a NHS or private insurance companies) offers health insurance contracts to consumers. Such contracts specify the insurance premium, the providers the individuals have access to when ill, and the associated copayments. In a second stage, each insurance company defines the set of selected providers to which the individuals that have contracted a health insurance have access to when ill. Finally, in the third stage of the game, providers compete in prices and qualities in the market. The competitive process among providers is influenced by the selection decision of providers by the insurance companies to provide health care services to their population of insured individuals. This order of moves is the more natural one for health systems where the third-party payer has a very strong commitment to provide health care in case of need or when third-party payers and providers are able to renegotiate terms and conditions after insurance contracts have been signed with consumers.[2] We tackle the third stage of the game in Barros

[2]Of course, it may be the case that in certain circumstances a different timing assumption is needed. For example, there are states in the US where insurers have to show evidence that providers are willing to accept the insurance plan within a given geographic region prior to marketing the plan.

and Martinez-Giralt (2002). There, we study the competitive effects on providers from different reimbursement rules.

The present paper looks at the second stage of the game, that is, we analyze how an insurance company decides the selection of providers to which the individuals contracting a health care insurance will have access to. To make the problem tractable, we consider one third-party payer and two providers. We take the perspective of a third-party payer that at the beginning of its activity has a set of providers to choose among. The decision of the third-party payer consists in determining the price at which to reimburse the health care services offered to patients insured with the company. We look at this problem from two different angles. The third-party payer may bargain the reimbursement policy with each provider, or may decide an "any willing provider" policy. In this case, health plans accept any health care provider who agrees to conform to the plan's conditions, terms and reimbursement rates. The question we address is which of these procedures should a third-party payer select.

The comparison between the bargaining protocol with the "any willing provider" mechanism hinges upon the size of the surplus to be shared. Given that the "any willing provider" mechanism represents a commitment to be tough, the larger the surplus, the more valuable this commitment is.

This paper relaters with the works by Davidson (1988) and Gal-Or (1997, 1999). Davidson looks at a model of wage determination where two firms bargain either with (i) the unions representing their respective workers, or (ii) a single union representing all workers. This latter scenario corresponds to our bargaining setting between the third-party payer and the providers. Davidson aims at investigating the impact of the bargaining structure on wage determination. Our interest differs in two aspects. On the one hand, the consequences of the failure of the negotiation with one firm/provider, is to leave the rival firm as a monopolist in Davidson's model, while in for us, it implies that consumers patronizing that

If there is no renegotiation of prices after consumers sign insurance contracts, a different timeline of decisions would result. We see our timing assumptions as describing most situations. We thank an anonymous referee for calling our attention to this point.

provider must bear the full cost of the service. On the other hand, the aim of our paper is to provide rationale to the "any willing provider" mechanism. Davidson's scenario (i) represents an extension of our paper where several (two) payers negotiate with providers. This multipayer set-up is also used by Gal-Or (1997) to study 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 of the (both) providers. Also Gal-Or (1999) addresses the related issue of whether and how the formation of vertical coalitions between physicians and hospital enhances their bargaining power. It is also worth mentioning the work of Glazer and McGuire (2002), who analyze the interaction between a public payer (contracting on a AWP basis), a private one (selecting providers and adjusting prices according to quality), and a provider. This is a problem complementary to ours, as we consider only one payer and two providers, and no quality choice.

There are other possible mechanisms of interest. Among them, we can point out at sequential bargaining so that after the third-party payer has finished the procedure with one provider, it starts a new one with the second provider. Conducting sequential negotiations may nevertheless increase considerably transaction costs. The implications of sequential bargaining are left for future research.

The paper is organized in the following way. Section 2 lays down the model structure. In section 3 we report the equilibrium solution under bargaining, and describe the equilibrium characterization associated with "any willing provider" contracts. Next, section 4 discusses the optimal negotiation format. Section 5 concludes.

2 The model.

Assume there is population of consumers with a potential health problem. Each member of the population has a given probability of being sick. The expected mass of consumers demanding health care is 1 and it is distributed uniformly on a

$[0, 1]$ horizontal differentiation line. The location of the consumer in the horizontal differentiation characteristic is independent of the probability of occurrence of the illness episode. In terms of insurance choice models, this adds a background risk to the demand for insurance, thus reinforcing the demand for insurance (Eeckhoudt and Kimball, 1992). The population we study is made of patients and it is conceivably, a subset of all people insured. In the first-stage of the game, individuals face several possible states of the world (for example, healthy or sick). The uncertainty faced at that stage determines health insurance demand. After realization of uncertainty, if an individual is sick, demands one unit health care. The horizontal differentiation line represents the differences providers have at consumers eyes. It can be objective, like geographic distance, or subjective, such as personal taste for one provider over the other [3]. Providers are located at the extremes of the interval. Whenever a patient cannot patronize his(her) best preferred provider, (s)he suffers a loss in utility (or under the geographical interpretation, has to bear a transport cost). We assume the patients' utility loss increases at a constant rate t per unit of utility.

We also assume that consumers are subject to compulsory health insurance. Even in the presence of operating costs (recovered by insurance companies through a loading factor) and/or not all providers being included in the insurance plan, we take the consumer to contract full insurance. The assumption is made for simplicity and, again, does not change the qualitative features of the model. We can see it as a result of the insurance company offering only full insurance. To justify somewhat the assumption, we also consider that a consumer when signing the insurance contract does not know beforehand the position (s)he will have in the horizontal differentiation line when sick. This implies that when both providers are successful in reaching an agreement, consumers can patronize either of them only bearing the disutility cost. In case of disagreement with one provider, consumers have the choice of patronizing the in-plan provider at zero cost or the out-of-plan provider

[3] Implicitly, we assume that there are no quality differences across providers. Otherwise, a vertical differentiation dimension would have to be added to the problem. For quality issues in the provision of health care in the context of vertical differentiation models see Jofre-Bonet (2000) and the references therein.

at full cost. If no provider reaches an agreement with the insurer, it gives back the premia to consumers and providers compete à la Bertrand in the market.

The insurance contract defines a premium to be paid by consumers, which is taken as given at the moment of contracting with providers. When selecting providers, the third-party payer (in line with the complete three-stage game described above) has already collected the insurance premia/contributions from consumers. Thus, total revenues of the insurance company are exogenously given.

We restrict attention to equilibrium situations where the third-party payer contracts with at least one provider. The case of not contracting with any provider means that no insurance is, in fact, given. It cannot be an equilibrium contract of the full, three-stage, game. We ignore it in the ensuing analysis. We also assume, for simplicity, zero production costs in the provision of health care. Our qualitative results are insensitive to this simplifying assumption.

As mentioned above, two mechanisms of price formation will be studied. A way of contracting health care services frequently used by Governments and, to some extent, by private health plans or insurance companies involves the payer announcing a price, and providers deciding, on a volunteer basis, to join (or not) the agreement. This is known as "any willing provider" (AWP) contracts. Simon (1995) studies both the characteristics of the states that have enacted AWP laws and their effect on managed care penetration rates and provider participation. Also, Ohsfeldt et al. (1998) explore the growth of AWP laws applicable to managed care firms and the determinants of their enactment[4].

Alternatively, the third-party payer may negotiate with the providers. We propose the Nash Bargaining solution as the equilibrium concept. The Nash bargaining solution yields outcomes that satisfy a set of four conditions (axioms). These axioms have been interpreted as the guiding principles that an arbitrator would

[4]Within this framework, providers may be, or not, allowed to balance bill patients, that is, they may charge, or not, an amount to consumers on top of the price received by the third-party payer. Balance billing has received some attention in the literature. See Glazer and McGuire (1993), Zuckerman and Holahan (1991) and Hixson (1991). Since balance billing in not crucial to our arguments, we assume it away. This assumption is also supported by its prohibition in several countries.

follow to solve a situation of conflict.[5] The solution was shown to maximize the product of each bargainer gains over the fallback position. The notion of bargaining power is embodied in the parameter δ. The Nash bargaining model can be linked to alternating offers models, thus providing some justification to bargaining power.

The alternating offers model sets the bargaining process as a sequence of offers and counteroffers. This allows for an explicit treatment of bargaining as a time consuming activity and of time preferences of bargainers. Typically, alternating offers models are able to establish a relationship between bargaining power in the Nash bargaining model and the discount rates of agents, costs of delay, and the period of time between offers.[6] In our case, it would involve the same degree of arbitrary judgement to endow the third-party payer and health care providers with distinct time-preference rates or to directly set their bargaining power parameter in the Nash bargaining solution. For simplicity, we have decided for the latter modeling option.

In our setting, the conflict appears because the insurer's cost represents the providers' revenues. Naturally, the outcome of the negotiation hinges on the parameters of the bargaining problem. These are the distribution of bargaining power among the players and the so-called "status-quo", or the fallback values. That is, the outcome that would arise should the negotiation fail. We assume that providers do not collude, that is negotiations are carried simultaneously with the two providers who decide their actions in a non-cooperative way. The issue of collusion among providers is tackled in a companion paper Barros and Martinez-Giralt (2004).

There is a difference to existing literature that is worth noting. Fallback values in one negotiation in our setting, depend on the outcome of the other negotiation. This happens because providers after each negotiation compete in the market. Thus, the outcome of each negotiation is conditional on the expected price of the

[5] The axioms are: invariance to equivalent utility representations, symmetry, independence of irrelevant alternatives and Pareto efficiency. See Osborne and Rubinstein (1990, pp. 11-13).

[6] For a textbook treatment of the alternating offers model and its relation with the Nash bargaining solution, the interested reader can consult Muthoo (1999, ch.3).

other provider. we force expectations to hold in equilibrium.

A detailed analysis of all these elements is beyond the scope of the present paper. Extensive presentations of bargaining theory are Binmore et al. (1986), Osborne and Rubinstein (1990) or Roth (1985). Also, a short introduction is provided by Sutton (1986).

Generically, providers may have different bargaining powers, so that the distribution of bargaining power will involve a parameter constellation for the third-party payer and the two providers respectively. However, we are interested in comparing different systems of negotiation between a third-party payer and a set of providers. To keep focus in this issue we will assume that all providers have the same bargaining power, so that they will be symmetric in all respects. We could think of asymmetries in bargaining power as a way to capture differences in technology, size, quality, etc. among providers. In turn, this would imply that we would have to allow providers to react to the differential characteristic (e.g. invest in size, R& D, quality, etc.) introducing an additional stage in the game. In our perception this implied modeling would add little to the determination of prices. We discuss the implications of this assumption at the end of the paper.

3 Equilibrium analysis.

3.1 "Any willing provider" contracts.

"Any willing provider" contracts have the third-party payer announcing a price p, and leaving to the providers the option of joining, or not, the agreement[7]. In a world of two providers, the set of possible decisions defines four different sub-games in prices, which in turn define previous-stage profits for providers. Therefore, we first characterize the four subgames. When both providers choose to join the agreement, demand is split in half. Each provider receives price p. Profits earned are $\Pi_i = p/2$, $i = A, B$. In the other polar case of both providers choosing not to join the agreement, the market game is back to the Hotelling price game. As mentioned

[7] Although in reality AWP contracts also include conditions on dimensions other than price, here we concentrate on the price aspect to be able to compare the outcome of AWP contracts with the corresponding outcome of the negotiation procedure.

before, equilibrium profits are $\Pi_i = t/2$, $i = A, B$.

The last possible case has one provider joining the agreement and accepting to receive p, while the other stays out and sets freely its price. Without loss of generality, we assume provider A to join the agreement. Demand is defined by the location of the indifferent consumer, which is given by:

$$tx = p_B + t(1 - x) \text{ or } x = \frac{1}{2} + \frac{p_B}{2t}.$$

Since providers are not allowed to balance bill patients, someone visiting provider A pays nothing while if he visits provider B pays the full price charged by the latter provider. The equilibrium price of provider B is $p_B = t/2$ and profits are $\Pi_B = t/8$ and $\Pi_A = 3p/4$.

The payoff matrix of the first-stage of the subgame is now given by Table 1.

A/B	Join	Not Join
Join	p/2 ; p/2	3p/4 ; t/8
Not Join	t/8 ; 3p/4	t/2 ; t/2

Table 1: AWP equilibrium profits.

For the outcome of both providers joining to be an equilibrium, it is necessary and sufficient that

$$\frac{p}{2} \geq \frac{t}{8} \text{ or } \frac{p}{t} \geq \frac{1}{4}.$$

On the other hand, for both providers to stay out of the agreement, we need to have $p/t < 2/3$. It is straightforward to check that there is no asymmetric equilibrium in pure strategies. The different possibilities can be traced in the (p, t) space as shown in Figure 1. Although this may appear natural given the symmetry of players, *à priori* one could not rule out that asymmetric equilibria may result from an *ex-ante* symmetric market structure.[8]

It is clear that there is a range of parameter values for which both equilibria may arise. We use Pareto dominance (from the providers' viewpoint) as selection

[8]Most textbooks of game theory provide 2×2 games of symmetric agents where only asymmetric equilibria exist. More structured market situations, like vertical differentiation, also result in asymmetric equilibria with *ex-ante* identical firms.

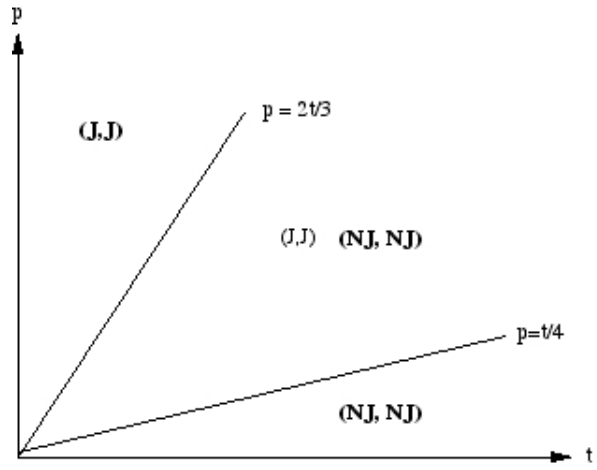

Figure 1: AWP equilibrium regimes.

criterion, which ensures that only one equilibrium is selected. Thus, the equilibrium where both providers join the agreement occurs for $p/t \geq 2/3$, as in the intermediate range it is dominated by the other equilibrium candidate.

We take now the optimal choice of the price set by the third-party payer. The criterion is the minimization of total health expenditure. Given the initial assumption of full insurance, all expenses will be paid, irrespective of the provider chosen by each particular consumer. The optimal value of p to be announced in the "any willing provider" contract is the lower price that still allows for both providers accepting it. Thus, the optimal price is $p/t = 2/3$. This optimal price is also lower than t, which guarantees that the third-party payer prefers to announce "any willing provider" contracts instead of allowing free competition between the parties (and having to reimburse consumers from the care they would seek in a pure private market equilibrium).

Note that the payer needs to announce a fee sufficiently high to induce participation of at least one provider. But in equilibrium with both providers participating the fee is lower than what the take-it or leave-it offer would have been. In other words, the payer is willing to give away some monopoly (bargaining) power in order to induce an equilibrium with providers' participation. Thus, softening the (full) bargaining power that too a rigid payer would reflect in committing to a high

fee.

One could think of alternative ways to model fee schedules, such as a two-part tariff where the variable part could be linked to the market share of the provider. As we are only dealing with price schemes, appealing to real market situations, this type of schemes are beyond the scope of this paper. Alternatively, the payer could propose a price scheme conditional on the number of participants. In particular, a price,

$$p = \begin{cases} 2t/3 & \text{if one provider participates} \\ t/4 & \text{if two providers participate} \end{cases}$$

would yield a unique equilibrium $p = t/4$ with both providers joining the agreement. However, AWP regulation does not allow for discrimination among participants. Also, in our setting of perfect information, the equilibrium price should be renegotiation-proof, so fees are not to be expected to be adjusted once providers have agreed to the price.

3.2 Bargaining.

By bargaining we refer to the situation where the third-party payer carries negotiations simultaneously but independently with the providers. The third-party payer has a bargaining power strength parameter given by δ and each provider is endowed with $1 - \delta$. Note that this situation does not correspond to a process where after failing to close a deal with one provider, the third-party payer addresses the second one. In our scenario, the provider when accepting or rejecting a deal *does not know* the outcome of the other parallel negotiation process.

Three scenarios may appear. Both providers successfully close the negotiation with the third-party payer, none does, or only one is successful. We start by introducing some notation. Let R be the (exogenous) premia collected by the third-party payer. F denotes the penalty to the third-party payer when one provider does not accept. This penalty is left unspecified at this stage. It captures the point that an insurer giving access to a smaller set of options in health care provision faces a cost to it (for example reputation, value of variety and freedom of choice to consumers, or money returned to insured people). $\widehat{\Pi}$ are third-party payer's profits;

Π_i are profits to provider i when both negotiations are successful; $\widetilde{\Pi}_i$ are profits to provider i when its negotiation succeeds while j's does not, $\overline{\Pi}_i$ are profits to provider i when its negotiation fails while j's is successful. Finally, $\underline{\Pi}_i$ are profits to provider i when both negotiations fail. Table 2 summarizes these alternatives.

$i \diagdown j$	Success	Fail
Success	Π_i, Π_j	$\widetilde{\Pi}_i, \overline{\Pi}_j$
Fail	$\overline{\Pi}_i, \widetilde{\Pi}_j$	$\underline{\Pi}_i, \underline{\Pi}_j$

Table 2: Providers' profits alternatives.

Given that we are assuming away production costs in the provision of health care services, providers' profits are simply the revenues from providing treatment to those patients patronizing the respective facilities.

Profits obtained by the third-party payer when negotiations are successful with both providers are given by $R - \Pi_A - \Pi_B$. When, say, only provider A reaches an agreement, the revenues to the third-party payer are $R - \widetilde{\Pi}_A - F$. Finally, if no negotiation succeeds, the third-party payer obtains zero revenues (as no insurance is contracted). In this latter case the market game is just a Hotelling price game with fixed locations. The symmetry of the solution implies equal demand to each provider and prices are, in equilibrium, $p_i = t$, $i = A, B$. Associated equilibrium profits are $\Pi_i = t/2$, $i = A, B$.

Two successful negotiations.

We deal first with the conditions to be satisfied such that both negotiations are successful.

Given our assumption of full insurance, an equilibrium with both providers accepting exists, given the symmetry between providers, when the same price prevails for both. Hence, providers will share the market evenly and their profits will be given by half of the respective equilibrium price since total demand is normalized to the unit.

The negotiation with provider A is described by the following problem,

$$\max_{P_A} \Big[(R - \Pi_A - \Pi_B) - (R - F - \widetilde{\Pi}_B)\Big]^{\delta} (\Pi_A - \overline{\Pi}_A)^{(1-\delta)}.$$

where P_A and P_B denote the fees for providers A and B respectively.

The fallback level of the third party payer is defined by the profits it obtains under the agreement with the other provider, net of the penalty associated to a smaller set of providers than the maximum possible. The fallback for the provider is given by the profits available when the rival provider succeeds in his(her) negotiation. This are profits when provider i is out-of-plan, so that those patients patronizing it have to bear the full cost, while its rival is an in-plan provider. This implies that the consumer indifferent between either provider is given by $x(P_i) = \frac{1}{2} - \frac{P_i}{2t}$ and provider i's profits are given by $\overline{\Pi}_i(P_i) = P_i x(P_i)$. Thus, the maximizer price is, $P_i = \frac{t}{2}$, and profits $\overline{\Pi}_i = \frac{t}{8}$.

Similarly, the negotiation with provider B is given by,

$$\max_{P_B} \Big[(R - \Pi_A - \Pi_B) - (R - F - \widetilde{\Pi}_A)\Big]^{\delta} (\Pi_B - \overline{\Pi}_B)^{(1-\delta)}$$

From the symmetry of providers, $\widetilde{\Pi}_A = \widetilde{\Pi}_B = \widetilde{\Pi}$ and $\overline{\Pi}_A = \overline{\Pi}_B = \overline{\Pi} = t/8$.

The first order conditions of the maximization problems yield,

$$P_i = 2(1-\delta)(F + \widetilde{\Pi} - \frac{1}{2}P_j) + \frac{\delta t}{4}, \quad i, j = A, B;\ i \neq j.$$

Solving the first order conditions and defining $\widetilde{R} \equiv F + \widetilde{\Pi}$ we obtain the (symmetric) prices:

$$\widetilde{P} = \frac{2(1-\delta)}{2-\delta}\widetilde{R} + \frac{\delta t}{4(2-\delta)} > 0.$$

Substituting the value of $\widetilde{R}$,

$$\widetilde{R} = F + \widetilde{\Pi} = F + \delta\frac{t}{2} + (1-\delta)(R - F)$$

we obtain,

$$\widetilde{P} = \frac{2(1-\delta)}{2-\delta}\left[\frac{\delta t}{2} + (1-\delta)R + \delta F\right] + \frac{\delta t}{4(2-\delta)}$$

These (positive) prices are equilibrium prices if two additional consistency conditions are met: (i) no provider wants to leave the agreement and (ii) the third-party payer obtains non-negative revenues. Condition (i) requires $\Pi(\widetilde{P}) = \widetilde{P}/2 \geq \overline{\Pi}_i = t/8$. This is satisfied iff $\widetilde{R} > t/4$. Condition (ii) is fulfilled iff $R \geq \widetilde{P}$.

One successful negotiation only.

Take now the case of only one provider accepting the price determined in the negotiation process.

Assume that provider i accepts the deal while provider j rejects it. The negotiation process between the third-party payer and provider i is described by,

$$\max_{P_i}(R - \widetilde{\Pi}_i - F)^{\delta}(\widetilde{\Pi}_i - \underline{\Pi}_i)^{1-\delta}.$$

The solution of this problem is given by,

$$\begin{aligned}
P_i =& \frac{4}{3}\Big(\frac{\delta t}{2} + (1-\delta)(R-F)\Big); \quad P_j = \frac{t}{2};\\
\widetilde{\Pi}_i =& \frac{\delta t}{2} + (1-\delta)(R-F); \quad \overline{\Pi}_j = \frac{t}{8}; \quad \text{and,}\\
\widehat{\Pi} =& \delta\Big(R - F - \frac{t}{2}\Big).
\end{aligned}$$

The pair (P_i, P_j) will constitute an equilibrium price pair if (i) providers' prices and third-party revenues are non-negative and (ii) provider i is not willing to quit the agreement (i.e. $\widetilde{\Pi}_i \geq \underline{\Pi}_i$) and provider j does not want to join it (i.e. $\overline{\Pi}_j \geq \Pi_j$).

Third-party revenues are non-negative iff $R - F \geq t/2$. This condition is also sufficient to ensure that $P_i \geq 0$ and that provider i does not have incentives to leave the agreement. Provider j does not want to join iff $R \leq t/4$.

Note that the latter condition is not compatible with the former, so that we cannot have an equilibrium with only one provider successfully terminating the negotiation with the third-party payer.

We can summarize the discussion in the following proposition.

Proposition 1. *It is not possible to find an equilibrium configuration where only one provider reaches an agreement with the third-party payer.*

Moreover, when $\widetilde{R} \geq t/4$ and $R \geq \widetilde{P}$, both negotiation processes are successful and the equilibrium price is given by $\widetilde{P} = \dfrac{2(1-\delta)}{2-\delta}\widetilde{R} + \dfrac{\delta t}{4(2-\delta)}$.

This proposition implies that under explicit bargaining procedure with identical providers it cannot be the case of only one successful negotiation. Again, in our

framework, the symmetry of players does result in a symmetric equilibrium. The disadvantage in terms of demand from being left out is higher than the advantage of being a price-setter. Moreover, it is not clear that the equilibrium price is smaller than the one prevailing on the stand-alone market (that is, without insurance to consumers). The condition for a higher price under bargaining relative to the stand-alone case is $\widetilde{R} \geq t/2$, which is compatible with the conditions for existence of a bargaining equilibrium.

4 The preferred negotiation format.

Note that the comparison between bargaining and AWP is only relevant for $p \geq 2t/3$ and also for $R \geq \min\{\frac{t}{2} + F, \frac{2t}{3}\}$. As shown previously, values of R above $\frac{t}{2}+F$ ensure non-negative profits to the payer under bargaining and also guarantees participation by the providers; values of R under $2t/3$ would yield negative surplus to the payer under the AWP regime.

From the point of view of the third-party payer, the bargaining procedure is better than "any willing provider" if

$$\widehat{\Pi}_{SB} - \widehat{\Pi}_{AWP} = p - \Big(\frac{\delta t}{4(2-\delta)} + \widetilde{R}\frac{2(1-\delta)}{2-\delta}\Big) > 0.$$

This condition defines a line, as shown in Figure 2, which allows for a simple description of the basic economic intuition. The intuition runs as follows. If $\widetilde{R}$ is small, there is not much surplus to bargain. Hence, prices will be below the price required in the any willing provider case to generate the acceptance outcome. The reverse occurs for high $\widetilde{R}$. Since the bargaining process transfers surplus, the any willing provider contract is equivalent to a "tough" bargaining position. The commitment to a price is more valuable when $\widetilde{R}$ is large.

A comment is in order here. We have seen that under bargaining given the symmetry of the model both providers accept the same price. Why is it not the case that under AWP announcing that price is not an equilibrium? Actually, under AWP we have obtained that for any $p \geq t/4$ both providers join. Also, we have shown that there are two equilibria where both providers join and where no provider joins.

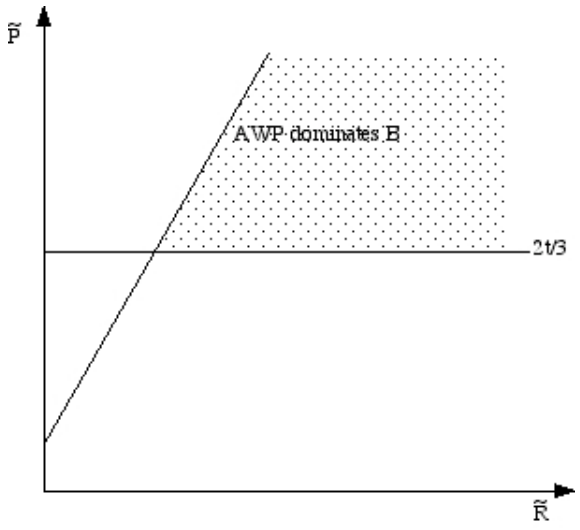

Figure 2: Optimal negotiation procedure

Artificially, (since the Pareto criterion does not select among the two equilibria) we are forcing $p > 2t/3$ to eliminate the equilibrium where no provider joins as it cannot be an equilibrium of the full three-stage game. In other words, we are imposing to the third-party payer a conservative behavior in the sense that we are not allowing it to announce a price $p \in (t/4, 2t/3)$ so that no provider would decide to accept.

In our two-provider world, it is never the case that one provider decides to join negotiations with the third-party payer, while the other provider remains outside any agreement. One may question whether this a general feature. In particular, we want to address whether this is a matter of a small number of providers, or not. The basic intuition carries through to a world with mode providers[9]. A question of interest is whether the increase in the number of providers does change the relative attractiveness of bargaining vs. any willing provider contracts. Under reasonable assumptions, an increase in the total number of providers makes less likely for any willing provider contracts to dominate. This is so because the equilibrium price under bargaining will be lower the higher the number of providers, while the

[9] An appendix available at ⟨http://ppbarros.fe.unl.pt/papers.html⟩, we show that there is no subset of providers which choose, in equilibrium, not to negotiate prices with the third-party payer.

optimal price under the any willing provider procedure is insensitive to the number of providers (see the appendix for details).

5 Final remarks.

In this paper, we address a simple question: what negotiation procedure should a third-party payer select when contracting health care providers? Two alternatives, commonly observed, have been considered: bargaining and "any willing provider" contracts.

The main finding of the analysis is that whenever the surplus to be shared in the bargaining is relatively high, the third-party payer prefers the "any willing provider" system. This is so because the simple price announcement constitutes an implicit commitment to be tough. This commitment is more valuable in the case of a bigger surplus.

Although most of the analysis has been done considering two providers only, we can extend the same arguments to an arbitrary number of providers. Moreover, under the symmetry assumptions used, the possible equilibria with an arbitrary number of providers are characterized either all providers joining the agreement with the third-party payer, or none accepting the proposal of the third-party payer.

Some caveats to the model deserve discussion. The first one is the symmetry across providers. We conjecture that introducing asymmetries across providers, be it in the bargaining power vis-a-vis the third-party payer, or in the production costs of health care services, will not change the qualitative results, especially if price discrimination by the third-party payer across providers is not feasible. This seems to be, in general, the case. Payments to providers can differ according to patient characteristics but not according to providers' efficiency level. Of course, some exceptions exist (for example, high reputation doctors may be able to obtain a better value for consultation).

Second, we conjecture that the introduction of asymmetries would allow us to obtain equilibria characterized by some providers being associated with the third-party payer, while others remain independent. Once again, we believe the relative

advantages and costs of the different bargaining procedures to still be present.

The third issue is quality. We have assumed away quality considerations. Thus, our analysis applies to the provision of services where quality can be easily monitored, or does not have a major impact on patients' selection of provider. Again, we conjecture that the essential trade-off in choosing between "any willing provider" contracts or an explicit bargaining procedure would remain. It would not change our insight related to the incentives of the third-party payer to choose one of the bargaining procedures proposed. This is left for future research.

The analysis renders some testable predictions. The simplest one to put to test is that whenever a high surplus to be shared exists, one should be observe more frequently "any willing provider" contracts. Another one is that the number of providers should not have an impact on the selection of the bargaining procedure as long as the surplus per patient treated is kept constant. If the per capita surplus grows (decreases) with the number of providers in the market, then one should observe "any willing provider" more (less) often. It is beyond the scope of the paper to empirically test these implications. The empirical testing of the model is left for future research.

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