A Non-Technical Introduction to Bargaining Theory

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1. Introduction

Bargaining is ubiquitous. Married couples are almost constantly negotiating over a variety of matters, such as who will do which domestic chores, who will take the kids to the local park on a wet Sunday afternoon, and whether or not the wife should take a part-time job, now that the kids are grown up.

Government policy is typically the outcome of negotiations amongst cabinet ministers. Whether or not a particular piece of legislation meets with the legislature's approval may depend on the outcome of negotiations amongst the dominant political parties. National governments are often engaged in a variety of international negotiations on matters ranging from economic issues (such as the removal of trade restrictions) to global security (such as the reduction in the stockpiles of conventional armaments, and nuclear non-proliferation and test ban), and environmental and related issues (such as carbon emissions trading, bio-diversity conservation and intellectual property rights).

Much economic interaction involves negotiations on a variety of issues. Wages, and prices of other commodities (such as oil, gas and computer chips) are often the outcome of negotiations amongst the concerned

parties. The current wave of mergers and acquisitions require negotiations over, amongst other issues, the price at which such transactions are to take place.

What variables (or factors) determine the outcome of negotiations such as those mentioned above? What are the sources of bargaining power? What strategies can help improve one's bargaining power? What variables determine whether parties to a territorial dispute will reach a negotiated settlement, or engage in military war? How can one enhance the likelihood that parties in such negotiations will strike an agreement quickly so as to minimise the loss of life through war? What strategies should one adopt to maximise the negotiated sale price of one's house? How can one negotiate a better deal (such as a wage increase) from one's employers?

Bargaining theory seeks to address the above and many similar real-life questions concerning bargaining situations. In this article I shall expound some fundamental principles of this theory in a non-technical language and in a simplified illustrative manner.

1.1 Bargaining situations and bargaining

Consider the following situation. An individual, called Aruna, owns a house that she is willing to sell at a minimum price of £50,000; that is, she 'values' her house at £50,000. Another individual, called Mohan, is willing to pay up to £70,000 for Aruna's house; that is, he values her house at £70,000. If trade occurs—that is, if Aruna sells the house to Mohan—at a price that lies between £50,000 and £70,000, then both Aruna (the 'seller') and Mohan (the 'buyer') would become better off. This means that in this situation these two individuals have a common interest to trade. At the same time, however, they have conflicting (or divergent) interests over the price at which to trade: Aruna, the seller, would like to trade at a high price, while Mohan, the buyer, would like to trade at a low price.

Any exchange situation, such as the one just described, in which a pair of individuals (or organisations) can engage in mutually beneficial trade but have conflicting interests over the terms of trade is a *bargaining situation*. Stated in general terms, a bargaining situation is a situation in which two or more players[2] have a common interest to co-operate, but have conflicting interests over exactly how to co-operate.

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[2] A 'player' can be either an individual, or an organisation (such as a firm, a political party or a country).

There are two main reasons for being interested in bargaining situations. The first, practical reason is that many important and interesting human (economic, social and political) interactions are bargaining situations. As mentioned above, exchange situations (which characterise much of human economic interaction) are bargaining situations. In the arena of social interaction, a married couple, for example, is involved in many bargaining situations throughout the relationship.

In the political arena, a bargaining situation exists, for example, when no single political party on its own can form a government (such as when there is a 'hung parliament'); the party that has obtained the most votes will typically find itself in a bargaining situation with one or more of the other parties. Witness the current coalition in Austria, Germany, India, Italy and Turkey or the co-habitations in France between Presidents of one party and Prime Ministers of another and the often severe divergence between the legislative and the executive arms in the USA.

The second, theoretical reason for being interested in bargaining situations is that understanding such situations is fundamental to the development of an understanding of the workings of markets and the appropriateness, or otherwise, of prevailing monetary and fiscal policies.

The main issue that confronts the players in a bargaining situation is the need to reach agreement over exactly how to co-operate. Each player would like to reach some agreement rather than to disagree and not reach any agreement, but each player would also like to reach an agreement that is as favourable to her as possible. It is thus possible that the players will strike an agreement only after some costly delay, or indeed fail to reach any agreement—as is witnessed by the history of disagreements and costly delayed agreements in many real-life situations (as exemplified by the occurrences of trade wars, military wars, strikes and divorce).

Bargaining is any process through which the players try to reach an agreement. This process is typically time consuming, and involves the players making offers and counter-offers to each other. A main focus of any theory of bargaining is on the *efficiency* and *distribution* properties of the outcome of bargaining. The former property relates to the possibility that the players fail to reach an agreement, or that they reach an agreement after some costly delay. Examples of costly delayed agreements include: when a wage agreement is reached after lost production due to a long strike, and when a peace settlement is negotiated after the loss of life through war.

The distribution property relates to the issue of exactly how the gains from co-operation are divided between the players.

The principles of bargaining theory set out in this article determine the roles of various key factors (or variables) on the bargaining outcome (and its efficiency and distribution properties). As such, they determine the sources of a player's bargaining power.

1.2 Some determinants of the bargaining outcome

If the bargaining process is 'frictionless'—by which I mean that neither player incurs any cost from haggling—then each player may continuously demand that agreement be struck on terms that are most favourable to her.[3] In such a circumstance the negotiations are likely to end up in an impasse (or deadlock), since the negotiators would have no incentive to compromise and reach an agreement. Indeed, if it did not matter *when* the negotiators agree, then it would not matter *whether* they agreed at all. In most real-life situations the bargaining process is not frictionless. A basic source of a player's cost from haggling comes from the twin facts that bargaining is time consuming and that time is valuable to the player. In section 2 below, I shall discuss the role of the players' degrees of *impatience* on the outcome of bargaining. A key principle that will be discussed is that a player's bargaining power is higher the less impatient she is relative to the other negotiator. For example, in the exchange situation described above, the price at which Aruna sells her house will be higher the less impatient she is relative to Mohan. Indeed, patience confers bargaining power.

A person who has been unemployed for a long time is typically quite desperate to find a job, and may thus be willing to accept work at almost any wage. The high degree of impatience of the long-term unemployed can be exploited by potential employers, who may thus obtain most of the gains from employment. As such, an important role of minimum wage legislation would seem to be to strengthen the bargaining power of the long-term unemployed. In general, since a player who is poor is typically more eager to strike a deal in any negotiations, poverty (by inducing a larger degree of impatience) adversely affects bargaining power. No wonder, then, that the richer nations of the world often obtain relatively better deals than the poorer nations in international trade negotiations.

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[3]For example, in the exchange situation described above, Aruna may continuously demand that trade take place at the price of £69,000, while Mohan may continuously demand that it take place at the price of £51,000.

Another potential source of friction in the bargaining process comes from the possibility that the negotiations might break down into disagreement because of some exogenous and uncontrollable factors. Even if the possibility of such an occurrence is small, it nevertheless may provide appropriate incentives to the players to compromise and reach an agreement. The role of such a *risk of breakdown* on the bargaining outcome is discussed in section 3. In particular, a key principle that will be discussed is that risk aversion adversely affects bargaining power: i.e., a player's bargaining power is higher the less averse she is to risk relative to the other negotiator.

In many bargaining situations the players may have access to 'outside' options and/or 'inside' options. For example, in the exchange situation described above, Aruna may have a non-negotiable (fixed) price offer on her house from another buyer; and, she may derive some 'utility' (or benefit) while she lives in it. The former is her outside option, while the latter is her inside option. When, and if, Aruna exercises her outside option, the negotiations between her and Mohan terminate forever in disagreement. In contrast, her inside option is the utility per day that she derives by living in her house while she temporarily disagrees with Mohan over the price at which to trade. As another example, consider a married couple who are bargaining over a variety of issues. Their outside options are their payoffs from divorce, while their inside options are their payoffs from remaining married but without much co-operation within their marriage. The role of *outside options* on the bargaining outcome is discussed in section 4, while the role of *inside options* is discussed in section 5.

In section 6, I shall discuss the role of *commitment tactics*. This tactic involves a negotiator taking actions prior to and/or during the negotiations that partially commit her to some favourable bargaining position. For example, before a government goes to international trade negotiations, it may attempt to enhance its bargaining position through public statements calculated to arouse a public opinion that permits few concessions to be made. A key principle that will be discussed is that a player's bargaining power is higher the larger is her cost of revoking her partial commitment; it is as if 'weakness' (having a high cost of revoking a partial commitment) is a source of bargaining strength. For example, a national government's bargaining power in international trade negotiations is higher the larger is the cost to that government of reneging on public commitments made to

its electorate. Another key principle that will be discussed is that the deployment of such commitment tactics can result in disagreements and/or costly delayed agreements. This may occur, for example, when two or more governments make incompatible partial commitments to their respective electorates, and their respective costs of reneging such partial commitments are sufficiently large.

An important determinant of the outcome of bargaining is the extent to which information about various variables (or factors) are known to all the parties in the bargaining situation. For example, the outcome of union-firm wage negotiations will typically be influenced by whether or not the current level of the firm's revenue is known to the union. A key principle expounded in section 7, where I shall discuss the role of such *asymmetric information* on the bargaining outcome, is that costly delays (such as strikes and wars) are mechanisms through which privately held information is credibly communicated to the uninformed party.

I conclude in section 8 with a summary of some of the fundamental principles expounded in this article, and with some final remarks.[4]

2. Impatience

Consider the exchange situation involving Aruna and Mohan described at the beginning of section 1.1. They will negotiate the price at which trade occurs by making offers and counteroffers to each other until an agreement is struck. The time interval between two consecutive offers is one day; this might be because they are able to communicate with each other only at one point during the day (such as each morning at 8.30am, before they go to work).

Each player values time: that is, each player prefers to reach agreement on any particular price today rather than tomorrow. For example, an agreement to trade at the price of £62,000 today would be preferred by each player to reaching the same price agreement one day later. A player's value of time can depend on a variety of factors, including personal circumstances such as income and wealth, and the market interest rate.

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[4]It may be noted that a bargaining situation is a game in the sense that the outcome of bargaining depends on *both* players' bargaining strategies: whether or not an agreement is struck, and the terms of the agreement (if one is struck), depends on both players' actions during the bargaining process. Indeed, the principles of bargaining theory that are expounded in this article have been obtained by using the methodology of game theory.

For example, a poor person is typically more impatient than a rich person, since she is more eager to strike a deal in order to quickly obtain her share of gains from co-operation.

The 'gains' from co-operation are often called the *surplus*.[5] For example, Aruna and Mohan are effectively bargaining over the partition of a surplus of £20,000; i.e., the difference between the maximum price at which Mohan is willing to buy Aruna's house (which is £70,000) and the minimum price at which she would sell it (which is £50,000).

Since each player (Aruna and Mohan) values time, they both have an incentive to compromise and reach an agreement without delay.[6] If Aruna and Mohan value time equally—that is, they are equally impatient—then it is quite likely that they would split the surplus of £20,000 equally between them; and thus, agreement would be reached on the price of £60,000.

Now suppose that Mohan is more impatient than Aruna. In that case his share of the surplus would be less than Aruna's share. To illustrate this point in a fairly transparent manner, suppose that Aruna is extremely patient, while Mohan is desperately impatient, perhaps because Mohan is in desperate need of a house, while Aruna is in no hurry to sell. In this case almost all of the surplus would go to Aruna—resulting in an agreement on the price of £69,000. This is because Mohan would be willing to accept almost any share of the surplus in order to strike a deal quickly; Mohan, being desperately impatient, values time so much that an agreement to pay £69,000 on the first day might be preferable to an agreement to pay £51,000 a day later. Aruna, being aware of this, can exploit it to her advantage. Indeed, the price at which trade occurs is higher the less impatient Aruna is *relative* to Mohan.

A key principle illustrated above is that a player's bargaining power (as captured, in general, by her share of the surplus) is greater the more patient she is relative to the other negotiator. This principle holds when the source of the haggling cost is other than time preference; for example, during union-firm wage negotiations, the union's haggling cost might

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[5]Most negotiations effectively involve bargaining over the partition of a 'surplus'. The negotiators have a common interest to reach an agreement over the partition of the surplus, but have conflicting interests over the exact partition (in that each player would like to obtain as large a share of the surplus as possible).

[6]A main cause of costly delays (such as wars and strikes) is the deployment of commitment tactics (as will be discussed in section 6) and/or the absence of complete information (as will be discussed in section 7).

depend on the size of its strike fund, while the firm's haggling cost might depend on the level of its inventory of finished goods. The larger the strike fund the lower the union's haggling cost, and thus, the greater its bargaining power. And, similarly, the larger the inventory level the lower the firm's haggling cost, and thus, the greater its bargaining power.

An implication of this principle is that to enhance one's bargaining power, a player should try to decrease her haggling cost and/or increase the other negotiator's haggling cost. For example, a union could decrease its haggling cost during next year's wage negotiations by building up a large strike fund during the current year; and similarly, a firm could decrease its haggling cost by building up a large inventory of finished goods.[7] It may be noted that decreasing one's haggling cost can be a costly activity. For example, it is costly to the firm to build up (and store) a large inventory of finished goods. As such, the cost of decreasing one's haggling cost (before negotiations begin) should be weighed against the expected benefit from doing so, where such benefit comes from obtaining a relatively better deal at those negotiations.

It is often difficult to decrease one's haggling cost. For example, consider international trade negotiations. A poor country will typically be more impatient than a rich country; that is, more eager to strike a deal early rather than later. Since wealth cannot be easily changed, the poor country seems doomed to accept a trade agreement that is more favourable to the rich country. Although both countries would be made better off by the trade agreement, the rich country will become relatively more better off, which would thus increase income and wealth inequality between the two countries. It would thus seem from an application of this basic principle of bargaining theory that economies are unlikely to 'converge' in wealth and income solely through an increase in international trade agreements aimed at reducing tariffs *et cetera*.

3. Risk of breakdown

While bargaining, the players may perceive that the negotiations might break down into disagreement because of some exogenous and

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[7]Mrs Thatcher getting the Coal Board to build up a year's worth of coal inventories in order to see off the National Union of Miners is an example of this point.

uncontrollable factors. A specific factor that may generate such a risk of breakdown is that the players may get fed up as negotiations become protracted, and thus walk away from the negotiating table. This type of human behaviour is 'random', in the sense that the exact time at which a player walks away for such reasons is difficult to determine in any definite way. Another possible factor that may lead to the existence of a risk of breakdown is when 'intervention' by a third party results in the disappearance of the gains from co-operation that exists between the players. For example, while two firms bargain over how to divide the returns from a new technology, an outside firm may discover a superior technology that makes their technology obsolete. Another example is as follows: while a corruptible policeman and a criminal are bargaining over the size of the bribe, an honest policeman turns up and reports the criminal to the authorities.

Consider, again, the exchange situation between Aruna and Mohan, and suppose that while bargaining over the price at which Aruna would sell her house to Mohan, on each day there is a tiny exogenous possibility that the housing market picks up. In that eventuality there no longer would exist any gains from trade between Aruna and Mohan, since Aruna would then value her house at, say, £80,000, while Mohan's value of her house would, let us assume, go up to only £75,000. Furthermore, in that eventuality Aruna would, we can assume, manage to sell her house to a different buyer for £83,000, thus netting a profit of £3,000, and, Mohan would manage to buy a different house worth £75,000 to him at a price of £68,000, thus netting a profit of £7,000.

Notice that the sum of their profits in the eventuality that the housing market picks up equals £10,000. Since this sum is less than the surplus of £20,000 that currently exists between them, it is mutually beneficial for Aruna to sell her house to Mohan at a price between £53,000 and £63,000.[8] This implies that they are effectively bargaining over the partition of a *net* surplus of £10,000, where the 'net' surplus is the difference between the surplus and the sum of their profits in the eventuality that negotiations break down the moment the housing market picks up.

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[8]Suppose, for example, that agreement were to be reached on the price of £52,000. This would mean that Aruna's profit from the sale equals £2,000. Since this is less than her profit of £3,000 that she can obtain by waiting until the housing market picks up, she would not agree to sell her house for £52,000. The agreed price must be sufficiently high so that her profit exceeds £3,000. At the same time, the agreed price must be sufficiently small so that Mohan's profit exceeds £7,000 (which is the profit he can obtain by waiting for the housing market to pick up).

It may be noted that if, in the eventuality that the housing market picks up, Aruna's profit were £8,000 (instead of £3,000), then she would sell her house to Mohan at a price between £58,000 and £63,000. Indeed, a key principle is that a player's bargaining power is higher the higher is her profit (or payoff) following the occurrence of the exogenous and uncontrollable factor that triggers a breakdown in the negotiations; and, similarly, a player's bargaining power is lower the higher is the other negotiator's payoff in that eventuality.

The exact partition of the net surplus between the players will depend upon their relative degrees of impatience (as was discussed above in section 2) and upon their relative degrees of aversion to risk. Indeed, a player's share of the net surplus is smaller the more averse to risk she is relative to the other negotiator. For example, if Mohan is more averse to risk than Aruna, then his share of the net surplus will be smaller than Aruna's share of the net surplus. The logic behind this principle runs as follows. Although it is mutually beneficial for the parties to strike a deal (rather than wait for the housing market to pick up), the more risk averse player is relatively more eager to minimise the risk of breakdown. This is exploited by the less risk averse player; she demands a larger share of the net surplus. Of course, if both parties are equally risk averse and equally impatient, then they are likely to split the net surplus equally between themselves.

4. Outside options

In order to isolate the role of 'outside' options on the bargaining outcome, I now assume that there is no risk of breakdown, and that each player values time equally. Consider the situation in which Aruna and Mohan are negotiating the price at which to trade. Suppose that before the negotiations with Mohan begin, Aruna has been made a non-negotiable (fixed) price offer on her house by another buyer; this is her 'outside' option. Let the price offered be £q, where q is greater than 50,000, but less than 70,000—that is, it is a price which would be acceptable to Aruna, but is less than the maximum amount that Mohan is willing to pay. As such, trade at any price that lies between £q and £70,000 would be mutually beneficial to Aruna and Mohan.

Suppose that in the absence of this outside option, trade occurs at the price of £60,000, which is the likely outcome when they are equally impatient. Now I describe what is likely to happen in the presence of this outside option. In its presence the agreed price will continue to be £60,000 if q is less than 60,000, but will equal £q if q is greater 60,000. This means that if Aruna's outside option is relatively small (more precisely, less than what she obtains in its absence), then it has *no* impact on the agreed price. But if her outside option is greater than what she gets in its absence, then the agreed price has to equal it. The logic behind this conclusion is straightforward, and has to do with the issue of the credibility (or otherwise) of threats in the bargaining process. Aruna's potential threat to sell the house to the other buyer at a price of £q is not credible when q is less than what Mohan is already offering her (namely, £60,000). This is because if Mohan refuses to agree to a price that is higher than £60,000, then she will not carry out her threat; since q is less than 60,000, she will prefer to trade with Mohan at the (originally agreed upon) price of £60,000. As such, Mohan can safely ignore such an empty threat, and continue to offer that agreement be reached at the price of £60,000. Notice that even if q equals 59,000, the outside option is useless; Aruna cannot extract a higher price from Mohan; she might as well not have this outside option. However, if q is greater than 60,000, then her threat to sell her house to the other buyer unless Mohan increases the price offer is credible. But, in this circumstance, all that Mohan has to do is to just match the outside offer, and offer a price that is a penny more than £q.

A key principle is that a player's outside option will increase her bargaining power if and only if the outside option is sufficiently attractive; if it is not attractive enough, then it will have *no* effect on the bargaining outcome. This is the so-called *outside option principle* (OOPS). Contrary to what is often suggested, OOPS tells us that having an outside option (such as an outside job offer) will not necessarily increase your bargaining power; it will not necessarily enable an employee to extract a higher wage from her current employer. In order to do so, the outside job offer must yield a wage that is higher than what your current employer is paying. It is no good approaching your employer and saying, 'I have just been made an attractive job offer that will pay me £65,000 per year, so please raise my wage, or else I quit'. The employer will reply by saying, 'but your current wage is £65,001, and thus, I refuse to increase your wage by even one

penny'. This response is based on the plausible presumption that the employee's threat to quit unless her wage is raised is empty (not credible); it is not in her interest to carry out the threat (*ex-post*). A basic, important message that is built in OOPS is that a negotiator should not let herself be influenced by threats (or promises) that are empty, in the sense that such threats and promises would not be carried out when, and if, time came to do so. Only credible threats and credible promises matter.

As an interesting application of OOPS, consider the following situation. An individual, called Jake, decides whether or not to steal one million dollars. If he does engage in this criminal act, then there is some possibility that he will be caught by a policeman. He believes that all policemen are corruptible, and thus they would then bargain over the size of the bribe that Jake would give the policeman so that he would not be reported to the authorities. If Jake is reported to the authorities, then he will be forced to return all the stolen money, and a penalty may be imposed on him— which could include a monetary fine and/or a prison sentence. Each player has an outside option, which is obtained if the policeman chooses to report Jake to the authorities; note that the policeman's payoff in that eventuality is zero, since he would get no bribe.

It follows from OOPS that Jake and the policeman would strike a deal in which Jake gives the policeman a bribe of half a million dollars for not reporting him to the authorities.[9] This is the agreed bribe irrespective of the size of the penalty that would be imposed on Jake were the policeman to report him to the authorities. Interestingly, even if the penalty is large, making the prospect of being reported highly unattractive to Jake, the policeman is only able to extract a bribe of half a million dollars. Indeed, the size of the penalty has no impact on the bribe that the corruptible policeman can extract from Jake. Does this make sense? Surely, if the penalty is extremely large, then, by threatening Jake with the prospect of being reported to the authorities, the policeman should be able to obtain the whole surplus of one million dollars? The point is that Jake knows that this threat is empty: the policeman would rather take a bribe of half a million dollars than report Jake and get nothing. Hence, committing the crime will always be worthwhile to Jake, no matter how large is the

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[9]This is because each player's outside option is not attractive enough; and thus, since it is being assumed that they are equally impatient, they would split the million dollars equally between them.

possibility of being caught by a corruptible policeman, and no matter how large is the penalty instituted by society. Indeed, even if Jake knew that for sure he will be caught, he would still commit the crime, since he would get to keep one-half of the stolen money. Thus, since the penalty is evaded through bribery, society may as well not institute it. The message here is that when policemen are open to bribery, standard instruments such as penalties are ineffective in deterring crime.

5. Marital bargaining

A negotiator's 'inside' option is the payoff that she obtains during the bargaining process—that is, while the parties to the negotiations are in temporary disagreement. In the context of the exchange situation discussed above, while Aruna and Mohan are bargaining over the price at which Aruna will sell her house to Mohan, she may be living in it. As such Aruna's inside option is the payoff (or utility) per day that she derives from living in the house. Her bargaining power is greater when she has a larger inside option. If Aruna derives much pleasure by living in her house, then she is less desperate to sell it; and this works to her advantage during the negotiations with Mohan. I now consider the interaction between outside options and inside options in the context of marital negotiations.

Married couples are almost constantly negotiating over a variety of issues such as who will do which domestic chores, and, whether the husband or the wife (or both) should have a job. The outcome of such negotiations matter to them, since it significantly influences how happy and well-off each partner will be in the marriage. Two main determinants of the outcome of such negotiations are each individual's outside and inside options. Their outside options are the payoffs that they obtain from divorce, which might, for example, be their payoffs from being single, or from finding an alternative partner. Their inside options are their payoffs from remaining married but with generally uncooperative behaviour (such as constant fights and arguments, refusing to undertake various domestic duties, making poor decisions about important matters, and making life difficult for each other).

The marital surplus can be thought of as the gain from marriage when the couple co-operate effectively with each other in the running of their relationship, and, in other domestic and non-domestic affairs. Negotiations

among the parties are essentially over the division of the marital surplus. Consider a marriage in which the marital surplus is so large that it is mutually beneficial for the couple to reach an agreement over the partition of the marital surplus (and live happily ever after) rather than exercise their outside or inside options. Since they have conflicting interests over the exact partition of the surplus, they will need to compromise and negotiate an agreement. In order to isolate the potential impact of their outside and inside options on how the marital surplus is divided, I assume that there is no risk of exogenous breakdown, and that the individuals value their time equally.

First, suppose that the outside option of each individual is sufficiently small, perhaps because they are both unattractive, and also would not find much happiness from living alone. In that case, it follows from OOPS that the outside options have no impact on how the marital surplus is divided. The inside options will have the decisive impact. If their inside options are of equal size, then the couple would split the marital surplus equally. Now suppose that the wife's inside option is bigger than her husband's inside option, perhaps because she suffers far less than her husband when they engage in fights and uncooperative behaviour. This works to the wife's advantage. Since her husband's inside option is relatively smaller, he is more eager to strike a deal over the partition of the marital surplus. As such, she is able to negotiate a bigger share of the surplus for herself; that is, the agreement that is reached is more favourable to her—for example, she may have to do only a few domestic chores and can, perhaps, spend Sunday afternoons visiting her parents while her husband takes care of the kids.

What happens if, instead, the husband has a fairly large outside option? In that case she is doomed; in particular, her relatively large inside option becomes irrelevant. More importantly, her husband's potential threat to seek divorce, which is now credible (since his payoff from divorce is large), will solely determine the division of the surplus. The deal struck will now be more favourable to the husband. The wife's attractive inside option has no impact in such a circumstance.

A key principle is as follows. When both players' outside options are sufficiently unattractive, then a player's bargaining power is higher the more attractive is his or her inside option, and, the less attractive is the other player's inside option. But, when one player's outside option is sufficiently

attractive, both players' inside options have no impact on the bargaining outcome; the player with the attractive outside option gets the more favourable deal. And, if both players' outside options are sufficiently attractive, then it is mutually beneficial for the players to exercise them. Indeed, if divorce is sufficiently attractive to both individuals (relative to the size of the marital surplus), then the couple are likely to get divorced.

The discussion above suggests that a good strategy to get a better deal out of a marriage is to enhance one's outside option—that is, the payoff from divorce. This might partly explain why some married couples make so much effort to keep themselves attractive. But, if both partners adopt such a strategy, then they risk making divorce mutually beneficial, in the sense that the marital surplus may become smaller than the sum of their payoffs from divorce. Thus, when such strategies are adopted by married couples, governments can perhaps offset the increase in the risk of divorce by increasing the marital surplus and/or decreasing the payoff from being single. This could be achieved, for example, by providing tax breaks and/or tax allowances to married couples, but not to singles.

Governments, especially in many poor countries, are concerned with the relatively poor deals that many married women tend to get from their marriages; their share of the marital surplus tends to be quite small. One strategy that has had some positive success in increasing the woman's share of the marital surplus has been to provide good employment opportunities specifically designed for married women (such as the development of local handicraft activities). The additional income earned raises the marital surplus, but it also improves the woman's outside option, allowing her to negotiate a better deal for herself from the marriage. Another strategy that has also helped to increase their share of the marital surplus has been to provide them with the opportunity to improve their educational skills. Indeed, better educated women tend to get better deals from their marriages. This is partly because education raises the possibility of obtaining gainful employment (and hence, it raises one's outside option). Although a married woman may choose not to seek such employment, her potential threat to be able to obtain it would now be credible. Education may also increase a married woman's bargaining power by enhancing her confidence to be able to haggle (and make proposals) over the partition of the marital surplus; uneducated women, in contrast, are more likely to

accept almost any proposal made by their husbands (and thus, they are likely to obtain relatively poor deals).

In some of the rich OECD countries, governments are also concerned with reducing the divorce rate (as well as improving the woman's welfare). Since improving the outside options too much raises the risk of divorce, an alternative strategy that may help reduce the divorce rate and, at the same time, enhance the woman's bargaining power within marriage, would be to make divorce somewhat more painful, and, at the same time, to significantly improve the quality and quantity of state-provided child care. The latter would significantly enhance the married woman's inside option, since she would no longer have to rely on the co-operation of the husband to help out with child care.

6. Commitment tactics

In many bargaining situations the players often take actions prior to and/or during the negotiation process that partially commit them to some strategically chosen bargaining positions (or, 'demands'). Such commitments are partial in that they are revocable, but revoking a partial commitment (i.e., backing down from one's demands) can be costly. The following extract from Schelling (1960) nicely illustrates this 'commitment' tactic:

> "…it has not been uncommon for union officials to stir up excitement and determination on the part of the membership during or prior to a wage negotiation. If the union is going to insist on $2 and expects the management to counter with $1.60, an effort is made to persuade the membership not only that the management could pay $2 but even perhaps that the negotiators themselves are incompetent if they fail to obtain close to $2. The purpose is to make clear to the management that the negotiators could not accept less than $2 *even if they wished to* because they no longer control the members or because they would lose their own positions if they tried. In other words, the negotiators reduce the scope of their own authority and confront the management with the threat of a strike that the union itself cannot avert, even though it was the union's own action that eliminated its power to prevent strike. (Schelling, 1960; page 27)."

If the cost to the union of revoking its partial commitment (not to accept a wage that is significantly less than $2) is sufficiently large, then the management may give in, and agree to offer a wage of $2; the union's tactic will have thus paid off. But if the cost of revoking such a partial commitment

is small, then the tactic may fail to achieve its objective. Thus, the deployment of such a commitment tactic will enhance a player's bargaining power (as captured, in this context, by the level of the agreed wage) if and only if the cost of backing down from one's demand is sufficiently large.

The commitment tactic is most effective when a negotiator is bargaining on behalf of a constituency. Indeed, national governments often use such a tactic prior to international negotiations. Consider, for example, two countries which are in dispute over a piece of territory, and, suppose that their respective governments are about to commence negotiations aimed at settling the dispute. Since each government knows that there is a wide range of potential agreements, it may create a bargaining position through public statements calculated to arouse a public opinion that permits few concessions. If such partial commitments (or, demands) are compatible with each other, then an agreement may be struck without the need for any one government to back down from its demand. Now consider the more typical case in which the demands (or, partial commitments) made by the two governments are incompatible with each other, in the sense that at least one government will need to back down and revoke its partial commitment if agreement to settle the territorial dispute is to be reached. If the cost to each government of revoking its partial commitment is sufficiently large, then it is quite likely that a negotiated settlement will fail to be struck. This illustrates the risk that the deployment of such commitment tactics entail; the parties risk winding up in a stalemate.

Now suppose that the demands are incompatible, but that each government's cost of backing down (i.e., revoking its partial commitment) is not too large, such that it would be prepared to back down (and incur a relatively small cost in doing so). In this circumstance, it is more likely that the government with the relatively smaller cost of backing down will be the government to back down; the other government will stay firmly behind its demand. Indeed, a government's bargaining power (as captured, in this context, by the area of land that it obtains from the negotiated settlement) is higher the larger is its cost of backing down, and the smaller is the other government's cost of backing down.[10] The logic behind this principle is based on the observation that the player with the relatively higher cost of backing down will find it more difficult to back

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[10]If a high cost of backing down is interpreted as a weak bargaining position (as may seem plausible), then this principle tells us that, in bargaining, 'weakness' can often be a source of bargaining strength.

down; that is, it is relatively easier for the player with the smaller cost of backing down to back down from her demand.

The principle described above may be illustrated in a fairly transparent manner by considering the case in which one government's cost of backing down is close to zero, while the other government's cost of backing down is significantly large; this might be because the former government is not democratically elected, while the latter government is a minority government in a strong democracy. In this case, the democratically elected government is likely to deploy this commitment tactic, and, expect to strike a relatively favourable deal for itself.

7. Asymmetric information

In some bargaining situations at least one of the players knows something of relevance that the other player does not. For example, in the context of the exchange situation described at the beginning of section 1.1, Aruna, the seller, may know the quality of her house, while Mohan, the buyer, may not. The house might be either of high quality (a 'peach'), or of low quality (a 'lemon'). How is the bargaining outcome affected by the presence of such an asymmetry in information (in that Aruna knows whether her house is a peach or a lemon, while Mohan does not)? A main consequence of this asymmetry in information is that an agreement may not be struck when, in fact, it would be mutually beneficial for Aruna and Mohan to trade. The logic behind this principle runs as follows. If Aruna's house is a lemon, then she has an incentive to pretend that her house is a peach, in order to obtain a relatively high price. Since Mohan would be aware of this 'incentive to lie', the maximum price that he would be willing to pay for the house may be less than the value that Aruna would place on it if her house is a peach. As such, trade between Aruna and Mohan may fail to occur if Aruna's house is actually a peach. Notice that Aruna cannot credibly convince Mohan by simply saying that she is telling the truth when she claims that her house is a peach; after all, she could be telling a lie.

In general, the absence of complete information—when at least one party to the negotiations possesses information about relevant variables (or factors) that the other party (or parties) do not have—will lead to inefficient bargaining outcomes. That is, outcomes with disagreements and/or costly delayed agreements. Some examples include: (i) failure to reach any

international trade agreement, or striking an agreement after a costly trade war; (ii) reaching a negotiated settlement to a territorial dispute after the loss of life and destruction of property through a military war; (iii) striking a negotiated wage agreement after a long and costly strike; (iv) divorce when remaining married would have been mutually beneficial to the couple; and (v) reaching an agreement over the marital surplus (covering a variety of domestic and non-domestic issues) after a long and costly period of uncooperative behaviour.

An important role of costly delays (such as strikes and wars) is to act as a mechanism through which privately held information can be *credibly* communicated to the uninformed party. Consider union-firm wage negotiations, and suppose that the firm's current level of revenue is not known to the union; it is either high or low. If the level of revenue is high then the firm can afford to pay a high wage. Clearly, therefore, the firm has an incentive to lie if its level of revenue is high. It would like to tell the union that the current level of revenue is low, and thus, it cannot afford to pay a high wage. At the same time, if the firm's level of revenue is genuinely low, then it needs to convince the union that this is really the case. The union needs to find a mechanism to credibly screen the information possessed by the firm. The strike weapon can act as such a mechanism. A union's commitment to go on a long strike unless a high wage is offered provides the firm with appropriate incentives to reveal its true level of revenue. If the firm has earned a high level of revenue, then it has a relatively greater incentive to offer a high wage and avert the strike. As such, if the union does go on strike (i.e., the firm does not offer a high wage), then it becomes clear to the union that the firm has a low level of revenue; for otherwise the firm would have offered a high wage, and the strike would have been averted.

The message here is that strikes are unavoidable consequences of asymmetric information. Of course, this message also implicitly suggests how strikes might be avoided: by finding alternative, less costly means of credibly communicating the firm's level of revenue to the union. For example, this might be achieved by allowing the union relatively free access to the firm's financial accounts, and by allowing union representa-

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[11]Of course, it may not always be in a firm's interest to do these things.

tives to sit on key decision-making bodies of the firm such as the board of directors.[11]

Similarly, nations go to war partly because of the absence of complete information; information on relevant matters are not known to all the parties. For example, the military capabilities and/or the resolve in pursuing a military campaign of your enemy may not be known to you with certainty. Indeed, if all relevant information were known to all the warring parties, then, in effect, they should be able to figure out what the final outcome of the war would be; and, hence, they should perhaps have an incentive to agree to that outcome immediately through a negotiated settlement—avoiding the long and costly war. But, alas, information is not so complete. War is partly a mechanism to communicate in a credible manner such information. For example, NATO's resolve to pursue a long military campaign during the recent crisis in the Balkans was not known to the world at large, let alone to the parties to the conflict. As such, the continuous aerial NATO attacks were necessary to credibly communicate to the relevant parties its resolve to achieve its objectives. Once any uncertainty over that resolve was removed, only then could a negotiated settlement to the dispute be struck. I suppose there was no other means of credibly communicating that resolve, other than by demonstrating it through war. In many other kinds of bargaining situations, it is unfortunately also the case that the only way to credibly communicate important information is via some costly and wasteful activity.

8. Concluding comments

Some of the fundamental principles expounded in this article may be summarised as follows:

- Patience during the process of negotiations confers bargaining power, while risk aversion affects it adversely.
- A player's outside option enhances her bargaining power if and only if it is attractive and therefore credible.
- A player's bargaining power is higher the larger is her inside option, provided that all negotiators' outside options are not attractive enough.

- If both negotiators' outside options are sufficiently attractive, then it is likely that gains from co-operation may not exist (and the parties may thus prefer to exercise their respective outside options).
- When both negotiators' costs of backing down from their initial demands are sufficiently large, then making such demands may risk leading the negotiations into a stalemate.
- A player's bargaining power is higher the larger is her cost of backing down from her initial demand.
- When a party does not know something of relevance to the ongoing negotiations which the other party does, there is a risk of failure of negotiations or of costly delay till the relevant information is credibly communicated to the uninformed party.
- Knowledge is veritable power in negotiations and enhances the bargaining strength of the better informed.

The above aspects of negotiations apply to various bargaining situations, and there are many more which are no less important in determining bargaining outcomes, as adumbrated below:

- Procedure and format of negotiations matter, particularly the initiative of making offers, rather than responding to them, confers bargaining power.
- Reputation of a player, say about strength, resolve and staying power, enables her to strike a better bargain than a party with a weak background.
- Populism, public interest litigation and judicial activism can paralyse negotiations unless bargaining is undertaken in complete confidentiality and the players are well aware of the multifaceted social, economic, political and other aspects of a bargaining situation and the eventual need for accountability and transparency.

In concluding this article, it may be noted that the principles discussed here can be applied to a significantly larger variety of real-life situations than may be indicated in this article. In particular, one interesting and important arena of human interaction that I did not discuss concerns multilateral negotiations. Examples of such situations abound: international trade negotiations may involve 190 nations, while bargaining in a legislature can involve anything up to 540 elected representatives or even more.

In such situations players may attempt to form coalitions in order to enhance their bargaining power.

The crucial question, then, is with whom does one form a coalition. For example, when no single political party has obtained a majority in parliament (as is often the case in democracies with proportional representation) bargaining amongst the political parties is necessary to secure a stable government. Not too different is the case of bargaining at global *fora* besieged by diverse economic, geo-political and other interest groupings. This calls for leaders, chief executives, strategic planners and policy advisors who are well versed in bargaining principles and their application under different situations.

References

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