THE PRACTICE OF LEGAL BARGAINING*

ECONOMIC THEORY

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Economic models of bargaining processes are used as a framework for studying some of the details and complexities inherent in legal bargaining. The presentation begins with a review of the abstract concept of bargaining and the importance of bargaining in both legal theory and practice. Simple examples then track two basic models of bargaining through a wide range of economic research, combining non-technical presentations of simple axiomatic and structural theories of bargaining, empirical data on bargaining behavior, and approachable overviews of behavioral and focal-point theories of bargaining. By way of conclusion, brief commentary is provided on the application the economic approach to bargaining to the practice of settlement negotiation as well as the contract theory of unequal bargaining power.

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INTRODUCTION

The motivation for this study is the idea that economic theory can provide useful instruction to law students learning about the practice and posture of legal bargaining. To help bridge the gap between formal theory and practice, the excursion begins with a brief exploration of background intuition on the concept of bargaining. Focus then turns to a discussion of the need for bargaining aptitude in the practice of law. The parts of the study immediately following this introductory material are intended to provide an easily accessible tour of the economic theory of bargaining and select empirical observations. The study concludes with brief commentary on the implications of economic bargaining research for the posture of bargaining issues in legal theory and for the actual practice of legal bargaining.

1.1 WHAT IS BARGAINING?

The basic concept of bargaining is at the same time familiar and elusive. On one hand, few people think critically about the abstract strategy of bargaining and even fewer have any formal training in bargaining or negotiation. On the other hand, most people engage in a large number of what are essentially bargaining practices throughout their lives, and on the strength of this experience, insight into the theory and practice of bargaining may be surprisingly close at hand. An initial question is to what extent base intuition about bargaining can be gleaned from experience with well-known bargaining applications.

One very familiar application of bargaining skills is the purchase and sale of expensive personal property. For example, buying a car often involves a good bit of haggling with the salesperson, as does the act of buying some types of art and furniture. The buyer in these negotiations is likely to remember the experience as uncomfortable on many levels. The salesperson (variously characterized as sleazy, underhanded, or manipulative) was probably an accomplished negotiator (at least within the scope of their employment), and was undoubtedly privy to information

unavailable to the consumer. The salesperson may have had, for example, special information about the break-even price of a car, the expected lifespan of a dresser, the timing of an upcoming sale, or the average price of similar products at competing retailers. It's easy to sympathize with the customer's plight in these examples: our intuition is that the deck is stacked in the salesperson's favor.

Another familiar form of bargaining goes into the purchase and sale of real estate. A homeowner, for example, can usually expect to negotiate with several prospective buyers in the process of selling a home; a prospective buyer can expect to engage several sellers before a successful bid is registered. What is our intuition about negotiating over real estate? As in the car buying example, the parties to a house sale are probably asymmetrically informed. The seller/homeowner knows a lot more about the neighborhood, the frequency of leaks during a storm, and the amount of money that was saved by cutting corners during a recent kitchen renovation. But relative to the car-buying example, the amount of bargaining experience between buyers and sellers does not have any obviously intuitive bias: neither party is likely to have engaged in many such sales/purchases, and there isn't an overwhelming reason to think that either buyers or sellers will be particularly more persuasive negotiators on average, differences in information aside.[1]

What about bargaining experiences outside of major financial transactions? Many everyday activities involve bargaining processes. Friends, for example, may engage in a friendly argument about where to go for dinner (and afterwards, about who gets to pick up the check). Family relationships are similarly replete with bargaining events. Examples include the allocation of household chores, the destination of the next family vacation, the decision whether to acquire a family pet, and the name of the inevitably acquired pet (no doubt, "Fido"). My impression is that most people have a good bit of experience at this type of bargaining, and are probably on relatively level footing in advocating their positions. These forms of interaction are so common and mundane that the bargaining involved often fails to register at any conscious level at all, being more at the level of heuristic rules of thumb.

1 But cf. Harding et al. (2003), searching for empirical evidence of differences in bargaining power in housing markets.

These common examples of bargaining processes reveal a few factors that might influence strategy and behavior. We tend to expect that relatively experienced or well-informed negotiators will be able to drive a *hard bargain*, and that comparatively disadvantaged parties could be taken to the cleaners. But the intuition to be derived from experience in common bargaining applications also has its limits. Many subtleties of bargaining escape casual observation, in large part because the lessons learned from one bargaining situation can fail to inform other bargaining contexts. For example, the strategies and norms that one develops in dividing family chores seem intuitively unreliable as a guide to negotiating a high-stakes merger between sophisticated corporations. The difference is not just the stakes and topic matter involved; the expectations of parties, the norms and conventions of negotiation, and even the method of communication between parties may be radically different in different bargaining contexts. This intuition is endemic of a larger problem: the limited scope of institutional knowledge in bargaining hinders generalized learning.

To illustrate the difficulty of thinking abstractly about bargaining, ask yourself this: "In my own words, how would I define a *bargaining* process?" I've occasionally asked (forced) students to do exactly this. The answers I get are a mix of surprised stammering and descriptive examples of archetypal bargaining patterns. The most common example to bubble to the surface in this exercise is the convergent demands pattern that seems to pervade mass media these days. It's a familiar story.

Example 1 (Convergent Demands)**.** *A* offers to buy *B*'s boat for $200. *B* says that she won't even consider selling for anything less than $800. *A* responds that the bottom of the boat is rusted out and that he doesn't even want a boat, but he is still willing to fork over $350 (basically because he's certifiably insane). *B* counters that she has a number of touching personal memories associated with the boat and (through tear-filled eyes) explains that she can't bear the thought of selling it, at least not for less than $700. A few minutes and some more haggling later, the parties settle on a price of $500—each secretly happy that he or she managed to get a *good deal* out of the

exchange.

There's nothing inherently wrong with the convergent demands example as a description of bargaining, but there's nothing inherently right about it either. It captures a lot of the basic elements of bargaining within the narrative (e.g. communication of offers, selecting strategies for making demands and deciding when to accept or reject a demand), but jumbles them all together in a way that makes it difficult to speak with precision about what's really going on. The example also encompasses a variety of conventions (e.g. an alternating pattern of demands, a sequence of demands that converge toward an intermediate position between prior demands, settlement on a final price halfway between initial demands) that may be conceptually distinct from the underlying definition of bargaining itself. In short, the answer my students give may be more valuable as an indication of what the average person expects from a bargaining process than as a description of bargaining qua theory.

So if the layperson's explanation of bargaining fails to satisfy, what is a better definition of the concept? This is the point at which it would be nice to say that economists have distilled out a clear and comprehensive definition of bargaining from which we can work. Sadly, the economic concept of bargaining is still far from crystallized, and economic thinking on the topic is itself largely an exercise in reasoning by example. An exception is the important case of *bilateral bargaining* (negotiations involving only two parties), where a variety of reasonable definitions provide helpful insight. Stefan Napel provides a succinct definition of bilateral bargaining along the following lines (Napel 2002, p. 1).

Bilateral Bargaining. A bilateral bargaining process is a transaction wherein two agents (1) have common interests in cooperating to achieve some end, but (2) have conflicting interests on the particular way in which the end is to be achieved.

This definition conforms nicely with the convergent demands example of bargaining discussed above. On the first prong, both A and B have a cooperative interest in seeing that the boat gets sold from B to A: A clearly values the boat more than B, so both parties are made better

off as long as *A* pays to *B* an amount less than *A*'s valuation of the boat, and more than *B*'s valuation. On the second prong, both *A* and *B* have conflicting interests over the price at which the boat is to be sold: all else equal, *A* prefers to buy the boat at a lower price, and *B* prefers to sell the boat at a higher price.

Note that the proffered definition of bargaining makes no attempt to suggest the process by which *A* and *B* should arrive at a decision. The example above involves alternating offers that converge toward a central value, but we could just as easily imagine other ways that *A* and *B* could have agreed on a selling price. For instance, *A* could have made a series of increasing offers until *B* accepted, or *B* could have written a ticket price on the side of the boat that *A* simply agreed to pay, or *A* could have given *B* a firm offer which *B* shopped around before accepting. All of these paths to agreement are possible, and all constitute forms of bargaining under the definition given above. Thus, while this definition of bargaining serves to illuminate some important aspects of bargaining, it is also a fair observation that the definition doesn't serve to rule much out either. More on this later.

1.2 WHY BARGAINING MATTERS IN LAW

Bargaining processes are pervasive in both the practice and theory of law. On the practical side, it should be remembered that relatively few civil cases are actually resolved by verdicts on the merits; the vast majority of disputes end in private settlements negotiated between the parties and their attorneys.[2] Outside of litigation, lawyers frequently negotiate contracts between clients, and are often asked to take part in complicated business and corporate negotiations. Particularly with the modern emphasis on plea bargaining (see, e.g., Alschuler 1979), the practice of criminal law is similarly laden with bargaining exercises and opportunities for negotiation. On the theoretic side, legal concepts of bargaining and "bargaining power" pervade much modern legal doctrine. Current

2 For example, contemporary national surveys suggest that only about 3–5% of tort cases are resolved by a verdict on the merits (Smith et al. 1995, p. 3; Cohen 2009, p. 14) as opposed to the more than 50% of disputes that are resolved by some form of private settlement (Smith et al. 1995, p. 3).

concepts of contract law are expressly wedded to the idea of an underlying bargaining transaction.[3] Bargaining issues are also implicated by contemporary doctrine in the law of corporations,[4] property theory,[5] the rules of professional responsibility,[6] and many other areas.

Given the prevalence of bargaining in legal practice and theory, it is somewhat startling to find that bargaining theory and negotiation skills are not more strongly emphasized in the standard law school curriculum. Lawyers are trained to be experts at legal reasoning, argument, and persuasion, but often must rely on instinct alone in their frequent obligations to be involved in and assess bargaining situations. How well do lawyers perform in the actual practice and theory of legal bargaining? Consider the following example.

Example 2 (The Reasonable Settlement Puzzle)**.** You are representing an older woman in a slip-and-fall tort case. Your client was injured when the moving walkway at an international airport suddenly jerked, causing her to fall and break her hip. She was not holding the handrail at the time, and was standing sideways on the walkway to talk with a friend that had just arrived. Medical bills for your client's leg have thus far amounted to $30,000; she predicts future medical bills of $5,000-10,000 and will never regain full functionality in her leg. What is a reasonable settlement package for your client under these circumstances?

After engaging in a brief bout of issue spotting and forming legal arguments, is it at all apparent what a reasonable settlement amount would be in this case? A simple but persuasive study is reported by Williams

3 See, e.g., the Restatement (Second) of Contracts §17 ("Requirement of a Bargain"): with few exceptions, "the formation of a contract requires a bargain in which there is a manifestation of mutual assent to the exchange and a consideration."

4 See, e.g., Smith v. Van Gorkom, 488 A.2d 858 (Del. 1985), which might be cited for the proposition that a corporate director's duty of care includes a requirement that director-led negotiations should secure a reasonable bargaining outcome for the shareholders.

5 See, e.g., Coase (1960) and Calabresi and Melamed (1972).

6 See, e.g., White (1980) for a discussion of lying in settlement negotiation. See also Korobkin et al. (2004) for comments on the legal limitations on bargaining behavior in general.

(1983, pp. 5–8), who persuaded 40 practicing attorneys (matched into 20 pairs) to actually negotiate the settlement of a simple fact pattern (something analogous to the above pattern but with specified jurisdiction and much more supporting detail). To incentivize real effort on the part of the participating attorneys, settlement outcomes were posted in a public forum where results could be compared by attorney. Among 14 responding pairs of lawyers (and for a different fact pattern than that give in Example 2), the average settlement was just under $50,000, but outcomes ranged wildly from a low of $18,000 to a high of as much as $137,000.

The point to take away from this study is not that any of the involved attorneys were obviously great or terrible negotiators. Bargaining is not that simple. The point is to realize that even relatively straightforward settlement negotiations can involve surprisingly difficult legal bargaining problems. Given the stakes involved, I submit that legal training can only benefit from additional emphasis on the study of bargaining. Among a number of competing theories of bargaining (see generally Honeyman et al. 2009; Condlin 2010), the remainder of this study presents an economic approach to the subject of legal bargaining.

THE THEORY OF BARGAINING

This part of the study provides a gentle introduction to the economic theory of bargaining. The first section introduces two prototypical bargaining problems and discusses basic concepts and intuition. Subsequent sections explore various theoretic approaches to understanding bargaining, particularly as they relate to these two prototypical bargaining problems. Solution concepts including both axiomatic and structural approaches to bargaining.

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2.1 BASIC CONCEPTS

In venturing into the abstract theory of bargaining, it helps to start out with some concrete examples and basic intuition. The following material introduces two very general bargaining problems that will provide a concrete framework for launching more detailed analyses in the remainder of Parts 2 and 3. Brief commentary is also provided regarding inferences that can be drawn about bargaining outcomes at even this very agnostic stage of analysis.

2.1.1 *Abstract Bargaining*

Economic research on bargaining often approaches the topic by analogy to the problem of two self-interested individuals who endeavor to *divide a pie* between themselves. There's nothing wrong with thinking of the pie as a literal dessert pastry, but to keep things simple, the pie will for present purposes be understood to be a perfectly divisible $1 dollar bill.[7] It will also be assumed that the pie is donated by an anonymous and disinterested third party, subject only to a restriction on what happens to the pie in the case of disagreement.

7 The perfect divisibility assumption is obviously wrong. A $1 dollar bill is only realistically divisible down to the smallest available unit (a penny in most commercial transactions, or 1/10 of a penny if you're buying gas in the United States). Fortunately, the assumption is not motivated by any important insight or conviction. It just avoids some unpleasant theoretic complications that are beyond the scope of the present analysis.

Model 1 (Pie Division)**.** A and B are two individuals who have been given the following bargaining opportunity by a disinterested third party.

(1) The third party will place \$1 on a table between A and B.

(2) A and B can keep the money if they can agree on a way to divide it between themselves.

(3) A division of the pie occurs if A and B mutually agree on an amount $0 \leq x \leq 1$ that will go to A, and an amount $0 \leq y \leq 1 - x$ that will go to B.

(4) In the event that A and B cannot agree on a division (i.e. a value of x) the third party will take the \$1 off the table, and A and B will leave with nothing in their pockets.

This highly abstract model of bargaining is representative of a larger class of pie division models that have been extensively explored in the economic literature on bargaining. While the narrative isn't going to win any awards for practicality or realism, the model provides an extremely simple setup for working through the theory of bargaining—a welcome difference from the insuperable difficulty of many more realistic ways to represent bargaining problems. The abstract model may also be more general than it initially appears. Consider the divergent demands example of bargaining presented in Section 1.1 in which two parties are bargaining over the selling-price of a used boat. If we assume the buyer values the boat \$400 more than the seller, then the exchange can be conceptualized exactly according to the abstract pie division problem, but with a \$400 pie instead of a \$1 pie.[8] By similar analogy, intuition developed for the pie division problem often admits surprisingly wide applicability.

8 The analogy is closest if we are willing to believe that the boat couldn't be sold to some further third-party in the event of a failure to reach agreement. Allowing for an alternative future sale opportunity (usually referred to as an *outside option* in the economic bargaining literature) requires a little additional algebra, but doesn't change anything fundamental about the problem or solution.

2.1.2 *Legal Bargaining*

In thinking through the application of abstract bargaining research to legal bargaining, it helps to have a specific legal bargaining model in mind as a point of comparison to the abstract pie division model of bargaining. Legal practice is replete with bargaining processes (as noted in Section 1.2), but the archetypal example of legal bargaining is probably settlement negotiation in a civil dispute. Our interest in settlement bargaining is twofold. First, it allows for immediate application of many abstract bargaining principles to a legal bargaining context. Second, it involves a negotiation context far removed from the toy case of dividing an exogenous pie, and thus helps to illustrate the ways in which conventional economic reasoning may fail to apply in some legal bargaining contexts.

Model 2 (Settlement Bargaining)**.** P and D are two individuals engaged in a legal dispute. Specifically, P was injured in an accident which he alleges was attributable to D's negligence. The legal dispute can resolve in two mutually exclusive ways.

(1) (Trial) In a trial on the merits, D will be held liable for the accident and ordered to pay P an amount $v \geq 0$ in damages. The cost of litigating the dispute at trial is $k_p > 0$ to P; the cost of litigating the dispute at trial is $k_d > 0$ to D.[9]

(2) (Settlement) Instead of taking the case to trial, P and D can privately settle their dispute. A settlement occurs if D agrees to pay P a compensatory transfer $s \geq 0$, and if in consideration of this transfer, P agrees to waive any further claim to legal remedy arising from D's connection with the accident.[10]

9 The letters v, k_p, and k_d are *arbitrary constants*, not variables to be solved for in this example. The intuition is that each constant represents a number: e.g. v = \$100,000, k_p = \$15,000, k_d = \$10,000. Why use letters at all? For one thing, employing arbitrary constants often simplifies analysis. For another thing, the use of arbitrary constants often provides greater intuition than does the use of numbers.

10 In contrast to the letters discussed in note 9, the letter s is not an arbitrary constant but a variable whose value is to be fixed by the interaction of parties in the negotiation. It is analogous to x and y in the pie division model: i.e. $x = s$ and $y = -s$.

Is this a particularly realistic model of the complexity and nuance of settlement negotiation? Not really. Among other things, we could increase realism by introducing stochasticity in the trial verdict process (i.e. making the outcome of a trial an effectively random event subject to some probability distribution) or by introducing differential costs at different stages of the litigation process (i.e. separating treatments of early interactions, post-filing interaction, post-discovery interaction, court-house steps interaction, and appellate review interaction). The more nuanced models that would follow from these changes may well serve a purpose in specific applications, but like the abstract pie division problem discussed above, the apparent simplicity of the basic model of settlement bargaining belies surprising generality. For present purposes, the additional complexity arising from more realistic assumptions would make for more tedious analysis without providing substantially greater insights than those already attainable under the simple model described above.

As it stands, the simple model of settlement bargaining is actually analogous to the even simpler pie division problem. How so? First, the trial verdict outcome in the settlement bargaining context is analogous to the no-agreement outcome in the pie division problem. It should be noted that these are not exactly the same. Whereas both individuals in the pie division problem leave the table with $0 in the event of disagreement, litigants in the settlement bargaining problem have asymmetric no-agreement payoffs: P walks away with net earnings of $v - k_p$ (damages less litigation costs) and D leaves with a total loss of $v + k_d$ (damages plus litigation costs). Second, the gross opportunity cost of trial in the settlement bargaining model is analogous to the exogenously donated pie in the pie division problem: i.e. the pie to be divided in the settlement bargaining model is exactly equal to $k_p + k_d$.

In retrospect, it is easy to see that $k_p + k_d$ must be the size of the pie. Consider the definition of bargaining proffered in Section 1.1: the parties to a bilateral bargaining process have interests that are in one part common, and in one part divergent. The common interests of litigants in settlement cannot relate to the size of the compensatory transfer from D to P, because that aspect of the bargaining process is exactly antagonistic. The value of a compensatory payment to P is exactly offset by an identical

cost to D. So why would litigants ever settle a dispute? The answer (at least in this simple model of settlement bargaining) is that settlement allows the parties to avoid paying the additional litigation costs that go into procurement of a trial verdict. In effect, private settlement allows the litigants to divide between themselves the $k_p + k_d$ savings (i.e. pie) that they obtain from not taking the dispute to trial.

2.1.3 *Initial Thoughts*

The question that we will be asking throughout the remainder of this part is how parties would be likely to bargain in these two model situations. What strategies would the parties employ, and what bargaining outcome could we expect to see? With few assumptions, we can already glean some important insights from the abstract models just described. To get some traction, assume that all parties have strictly pecuniary preferences. That is, assume for simplicity that parties only care about the amount of money they take away from the transaction, subject to an implicit understanding that more money is preferred to less.[11]

First consider the abstract pie division model of bargaining. Can we intuit anything useful about the range of reasonable bargaining outcomes? We can start by ruling out anything that is obviously unreasonable. Everyone prefers more money to less, so any division leaving money on the table would be patently unreasonable. By the same intuition, disagreement is an unreasonable outcome: disagreement is functionally the same as having both A and B agree to take $x = 0$ and $y = 0$, thus leaving the *entire* pie on the table. But as long as A and B manage to avoid disagreement and exhaust the pie (i.e. $x + y = 1$), no particular division of the pie is obviously silly. Even if one of the participants agrees to a division in which nothing is received, the payoff to that participant ($0) is still no worse than the $0 that would come from disagreement. Thus, without further assumptions about the structure or properties of bargaining, any feasible division of the pie seems basically plausible.

11 Many readers will find this assumption unrealistic, reasoning that parties may pursue a variety of non-pecuniary interests when bargaining. This is clearly correct, and these concerns will be addressed at length in subsequent discussion. For present purposes, the assumption is maintained only to simplify analysis.

This is hardly earth shattering insight, and a natural question is whether something so obvious is worth mentioning at all. To see that it might be, consider unpacking some of the logic that went into the above intuition. For example, our reasoning about the range of payoffs that either A or B would accept (anything more than $0), could be more abstractly framed as a suggestion that no party to a bargaining situation would be willing to accept an outcome that puts that party in a worse position than would the disagreement outcome. This is just a special case of the more general concept of *individual rationality*.

Individual Rationality. In a unilateral choice between outcomes X and Y, individual rationality compels selection of outcome X when outcome X is preferred to outcome Y.

Next consider our doubts about the reasonableness of either disagreement or any agreement in which some of the pie is left on the table. Our intuition was that both A and B prefer more money to less, so no outcome seems reasonable if it leaves some positive amount of money behind on the table. A more general expression of this intuition involves the related concepts of Pareto dominance and efficiency. As applied to a bargaining problem, the concept of Pareto Dominance instructs that a bargaining outcome is unreasonable if there exists another outcome that makes one party strictly better off without making the other party worse off. The concept of Pareto efficiency suggests that a bargaining outcome is reasonable if it is not Pareto dominated by another outcome.

Pareto Dominance. Outcome Y is Pareto dominated by outcome X if every party to a bargaining problem prefers outcome X to outcome Y.

Pareto Efficiency. Outcome X is Pareto efficient if there exists no other outcome Y such that outcome Y Pareto dominates outcome X.

Armed with these concepts about reasonable play, next consider the settlement bargaining model. This time individual rationality says something more useful. P nets a payoff of $v - k_p$ from a trial verdict, and

so will never agree to settlement unless $s \geq v - k_p$. Intuitively, P isn't going to settle for an amount less than what he can expect to get in net damages at trial. Similarly, D would only be compelled to pay a total of $v + k_d$ at trial, so she would never agree to settle unless $s \leq v + k_d$. Individual rationality thus bounds the range of reasonable settlement transfers to lie on the interval $v - k_p \leq s \leq v + k_d$. If the symbolic reasoning here is too abstract, consider the following example.

Example 3 (Numbers Instead of Letters)**.** Suppose at trial, P would be awarded \$1,000 in damages, but would need to pay \$100 in legal fees. Suppose also that D would need to pay \$50 in legal fees if the case went to trial. Then the most that D would be willing to pay in settlement is \$1,050 and the least that P would be willing to accept in settlement is \$900. The range of possible settlement transfers is thus \$900 $\leq s \leq$ \$1,050.

Pareto efficiency also has something to say in the settlement bargaining model. A settlement agreement simply transfers wealth from D to P, so every possible settlement amount $v - k_p \leq s \leq v + k_d$ is Pareto efficient. Intuitively, the pie actually *belongs* to D in the settlement bargaining context, so there's no concept of the transfer itself leaving any pie on the table (anything that doesn't go to P will automatically be kept by D). The only Pareto dominated outcome in settlement bargaining is the event of a trial verdict. Because any damages awarded at trial could be reproduced as a settlement agreement without the need for paying additional litigation costs, the trial verdict outcome is analogous to the forbidden act of leaving some of the pie on the table.

Even at this highly agnostic stage of analysis, simple intuition has revealed some interesting properties about the range of reasonable bargaining outcomes. Upon reflection, however, several problems are evident. First, while we are able to rule out a few outcomes as being obviously unreasonable, our concept of reasonable bargaining leaves behind a huge swath of ostensibly plausible outcomes in both cases. As will be seen in subsequent discussion, the wide range of plausible outcomes to a bargaining problem is one of the most difficult challenges facing any student of bargaining theory. Second, because so many bargaining outcomes

are essentially reasonable, it is difficult to imagine what strategies the parties might adopt in practice. In short, without saying a lot more about the parties and the bargaining process itself, we are unlikely to make much headway in answering the critical questions we raised previously: namely, how parties might be expected to bargaining in the pie division and settlement bargaining contexts.

2.2 THE AXIOMATIC APPROACH

This and the following sections of Part 2 consider what more can be said about reasonable or likely outcomes in the pie division and settlement bargaining problems. The present section is concerned with the axiomatic approach to finding bargaining solutions. To oversimplify somewhat, the axiomatic approach asks what properties would be reasonable to expect of a bargaining outcome, and then works backward from this point to determine how the involved parties should be expected to act.[12] The inferential strategy adopted in the previous section was a very modest form of axiomatic reasoning: in fact, the conclusions we reached in Section 2.1 parallel early treatment of bargaining problems in the economic literature (see von Neumann and Morgenstern 2007, pp. 556–57).

The following material presents two versions of the leading model of axiomatic bargaining proposed by John Nash (1950; 1953). In the more general version of Nash's bargaining model, the expected bargaining outcome is determined in part by the relative bargaining power of each participant. Because of its practical importance, the concept of bargaining power is given separate treatment. It should be noted that the underlying theory of the axiomatic approach can be very challenging, and that the following material has been greatly simplified with the intent of focusing directly on intuition rather than mathematics. The reader interested in deeper instruction on axiomatic bargaining may consult Roth (1979), Osborne and Rubinstein (1990), Binmore (1992), and Napel (2002) among others.

12 See, for example, Nash (1953, p. 129): in the axiomatic approach, "[o]ne states as axioms several properties that it would seem natural for the solution to have and then one discovers that the axioms actually determine the solution uniquely."

2.2.1 *Nash's Bargaining Model*

The axiomatic approach starts with a set of reasonable properties of a bargaining outcome (axioms) and then works backward from these properties to determine what bargaining outcomes satisfy the desired axioms (solutions).[13] So what are some axioms that seem natural about any bargaining outcome? We already uncovered two in the process of thinking through the pie division and settlement bargaining problems in Section 2.1.3.

One property we might expect of a bargaining outcome is individual rationality (p. 14). The intuition is that a bargaining outcome should not leave any participant worse off in agreement than they would have been in the event of disagreement. Another property that we might expect of a bargaining outcome is Pareto efficiency (p. 14). The intuition is that a bargaining outcome should never waste resources by leaving any gains on the table; to be Pareto efficient, there must be no alternative outcome that places one of the participants in a better position without placing another participant in a worse position.[14]

As we noted in Section 2.1.3, these two axioms are not by themselves enough to get much traction in narrowing the possible range of bargaining outcomes. Are there other axioms that we might expect a bargaining outcome to admit? The answer is obviously yes. One potentially desirable axiom is *symmetry*: the idea that unless participants to a bargaining process are in some meaningful way different, they should not fare differently in the bargaining outcome.

Symmetry. A bargaining solution exhibits symmetry when it does not distinguish between structurally indistinguishable participants.

13 In truth, much research probably works the other way, starting from a seemingly reasonable solution and then looking to determine which desirable properties the solution happens to exhibit.

14 The axiom of Pareto efficiency is in some respects uncomfortably strong. By itself, it is sufficient to eliminate any chance for disagreement in a bargaining outcome. An interesting discussion on this point is provided by Roth (1979, pp. 16–19), who also demonstrates that the less contentious axiom of individual rationality suffices to attain nearly the same result without restricting collective action (Roth 1977).

Put another way, symmetry instructs that the outcome of a bargaining process should not change if we were to swap only the identities of A and B without changing anything more fundamental about their ability to bargain (i.e. both parties retain their original preferences and disagreement outcomes). By implication, if both parties to a bargaining process were exactly identical, a symmetric solution would require that they leave the bargaining table with exactly the same payoffs (e.g. a 50/50 split of the pie).

Another property that we might desire of a bargaining solution is the *independence of irrelevant alternatives* (IIA). The precise restriction imposed by IIA can be somewhat opaque, but the basic idea is that adding or removing clearly inferior options from the set of possible bargaining outcomes should not change the way participants behave: the outcome of bargaining is thus *independent* of the introduction or removal of *irrelevant alternatives*.[15] The easiest way to grasp the idea of IIA is by example.

Independence of Irrelevant Alternatives. Suppose a bargaining process results in outcome X. If additional alternatives are added to the set of possible bargaining outcomes, independence of irrelevant alternatives requires the result of the new bargaining process to be either X or one of the newly added outcomes.

Example 4 (Independence of Irrelevant Alternatives)**.** Suppose that A and B are two friends trying to decide where to go for dinner. Their options are (1) a burger joint, or (2) a pizza shop. Without difficulty, A and B agree to go for burgers. The IIA requirement simply says that if we were to rewind the entire interaction and play it back again with the slight change of introducing an additional option—(3) a sandwich shop—then the bargain between A and B could be functionally represented as a choice between (1) the burger joint and (3) the sandwich shop. Enlarging the set of choices should not make A and B chose the pizza shop that they would otherwise

15 Cf. Train (2003, pp. 49-51) for discussion of IIA's plausibility in different contexts.

have voted down.

A final axiom of some importance is *independence of equivalent payoff representations* (IEPR). Without an extended digression on the concept of utility functions, the deep workings of IEPR are likely to remain mysterious. As a rough approximation, however, IEPR can be understood as a requirement that the outcome of a bargaining process should not depend on the arbitrary way in which we choose to measure participant preferences. Roth (1979, p. 10) analogizes IEPR to the difference between Celsius and Fahrenheit—the relation of numbers to temperatures differs between these two metrics, but the consequences of bringing a pot of water to 100°C are exactly the same as those of bringing it to 212°F.

Independence of Equivalent Payoff Representations. A bargaining game solution exhibits independence of equivalent payoff representations if different but functionally equivalent means of representing participant payoffs result in identical bargaining outcomes.

Building up this set of desirable (if somewhat peculiar) axioms is the wind-up to an axiomatic approach to bargaining. The pitch comes when a set of axioms is shown to provide a sharp statement about the set of reasonable bargaining outcomes in a given model. The leading example of an axiomatic approach to bargaining is the *symmetric Nash bargaining* (SNB) solution originally proved by Nash (1950, 1953) but subsequently refined by many other economists. The SNB solution uniquely satisfies the following four axioms: (1) Pareto efficiency, (2) symmetry, (3) IIA, and (4) IEPR.[16]

Symmetric Nash Bargaining Solution. In a bargaining process, define the agreement differential of each participant as the value of a particular agreement to that participant minus the value of disagreement to that participant. The SNB solution is the agreement that maximizes the

16 Proof of this statement involves mathematical techniques beyond the scope of the present study. The interested reader should consult Nash (1950, 1953) or Roth (1979) for the original proof; modified proofs are provided by Kalai (1977), Rubinstein et al. (1992), Binmore (1992), Napel (2002), and many others.

product of agreement differentials for all participants.

So what does *that* mean? Recall that an axiomatic approach to bargaining focuses only on the outcome of a bargaining transaction and the properties we might expect of that outcome. The SNB solution says nothing about how the parties might actually be expected to reach an agreement, but it does take a firm stance on what the agreement itself should be. Specifically, it suggests that the outcome should be the agreement that maximizes the product (i.e. multiplication) of the disagreement-adjusted payoffs of all involved participants. The following examples illustrate the SNB solution through application to the two prototypical bargaining problems introduced previously.

Example 5 (SNB Solution to the Pie Division Problem)**.** In the pie division problem, the agreement differential for A is equal to the payoff from agreement ($\$x$) minus the payoff from disagreement ($\$0$). The agreement differential for B is equal to the payoff from agreement ($\$1 - x$) minus the payoff from disagreement ($\$0$). The SNB solution is the division of the pie (i.e. the choice of x) that maximizes the product of the two agreement differentials: $\max_x x(1-x)$. Whether by simple calculus, basic algebra, or use of a computer spreadsheet, it is easy to compute that the SNB solution is $x = 1/2$. That is, the only agreement that satisfies all four of the SNB axioms is the outcome where A to takes $\$0.50$ for himself, and where B takes $\$0.50$ for herself.

Example 6 (SNB Solution to the Settlement Bargaining Problem)**.** In the settlement bargaining problem, the agreement differential for P is equal to the payoff from settlement (s) minus the payoff from disagreement ($v - k_p$). The agreement differential for D is equal to the payoff from agreement ($-s$) minus the payoff from disagreement ($-v - k_d$). The SNB solution is the settlement payment (i.e. choice of s) that maximizes the product of the two agreement differentials: $\max_s [s - (v - k_p)] \times [-s - (-v - k_d)]$. This is the only

settlement agreement that satisfies all four SNB axioms, and has as its solution the outcome where D and P privately settle their dispute for a transfer of $s = v + \frac{1}{2}(k_d - k_p)$.

The above examples illustrate the kind of symmetry at the heart of the SNB solution. In the pie division problem, the SNB solution is for the parties to agree on a 50/50 split of the pie because the disagreement payoffs are themselves equal. (Note in passing how much sharper this prediction is than the almost useless $0 \leq x \leq 1$ prediction we intuited in the previous section.) In the settlement bargaining problem, litigants facing equal litigation costs will settle for exactly the damages award that would occur at trial, but litigants facing different litigation costs will bump the settlement payment up (down) by ½ the amount that litigation costs to D exceed (are exceeded by) litigation costs to P.

Example 7 (Numbers Instead of Letters)**.** Let potential damages be $1,000 in every case.

(1) If litigation costs are $100 to both P and D, then the SNB settlement is for $1,000.

(2) If litigation costs are $50 to P and $100 to D, then the SNB settlement is for $1,025.

(3) If litigation costs are $100 to P and $50 to D, then the SNB settlement is for $975.

The SNB solution produces a *symmetric* outcome to the extent that disagreement payoffs of the parties are in some sense equal. Is this a sensible result? It's perfectly sensible if one is prepared to assume that the bargaining abilities of the participants are the same after controlling for differences in disagreement payoffs (Nash 1950).[17] While this assumption may be plausible in some circumstances, it conflicts with our earlier

17 Nash (1953) adopts the more agnostic view that the symmetry property may be best understood as an implication of the (parsimonious) structure of the model rather than an assumption about human interaction in the world. See Roth (1979, p. 21) for further discussion.

intuition that, in many interesting cases, experience, special information, and other factors may simply make some people *better bargainers* than other people (see Section 1.1). An allowance for variable bargaining capacities may thus be a desirable property of a model of bargaining.

Is it possible to generalize the SNB solution to the case where participants have different inherent bargaining capacities? The answer is (thankfully) yes. But in order to break away from the symmetry axiom, we need to introduce the concept of *bargaining power*. In the context of bilateral bargaining, let $0 \leq \alpha \leq 1$ denote the relative bargaining power of party A (so that $1 - \alpha$ denotes the bargaining power of party B). A value of $\alpha = 1$ means that A has maximum relative bargaining power (B has minimum relative bargaining power), a value of $\alpha = 0$ means A has minimum relative bargaining power (B has maximum relative bargaining power), and a value of $\alpha = 1/2$ means A and B have symmetric bargaining power. With this concept of potentially asymmetric bargaining power in mind, the *asymmetric Nash bargaining* (ANB) solution is the agreement that uniquely satisfies at least the following three axioms: (1) individual rationality, (2) IIA, and (3) IEPR.[18]

Asymmetric Nash Bargaining Solution. Define the agreement differential of each participant just as in the SNB solution. The ANB solution is the agreement that maximizes the product of bargaining-power exponentiated agreement differentials for all participants.

The ANB solution sounds mysterious when expressed in abstraction. In application, however, it is an intuitive generalization of the SNB approach. In fact, the ANB solution is identical to the SNB solution in the special case where $\alpha = 1/2$. The ANB approach is most easily demonstrated by example.

18 Different treatments of the ANB solution depend on different sets of axioms. Roth (1979, pp. 19–21) provides a proof in terms of these three axioms. Compare Osborne and Rubinstein (1990), asserting the result where individual rationality is replaced by Pareto efficiency, or Napel (2002), who adds Pareto efficiency to individual rationality in presenting a proof related to Kalai (1977). The close relationship between individual rationality and Pareto efficiency explains the basic equivalence of all these approaches (see note 14).

Example 8 (ANB Solution to the Pie Division Problem)**.** The ANB solution to the pie division problem is the division that maximizes the product of bargaining-power exponentiated agreement differentials: $\max_x x^{\alpha}(1-x)^{1-\alpha}$. It is easy to compute that the ANB solution is division of the pie at $x = \alpha$. That is, when A has all the bargaining power ($\alpha = 1$), he takes the entire pie, when A has none of the bargaining power ($\alpha = 0$), B takes the entire pie, and when bargaining power is symmetric ($\alpha = 1/2$), the pie is divided evenly.

Example 9 (ANB Solution to the Settlement Bargaining Problem)**.** Compared to the SNB solution, the ANB solution to the settlement bargaining problem is the settlement payment that maximizes $\max_s [s-(v-k_p)]^{\alpha} \times [-s-(-v-k_d)]^{1-\alpha}$. The computation yields an agreement of $s = v + \alpha k_d - (1-\alpha)k_p$. Thus, when P has all the bargaining power ($\alpha = 1$), he settles for damages *plus* the full amount it would cost D to continue litigating, when P has none of the bargaining power ($\alpha = 0$), he settles for exactly his payoff from disagreement (i.e. D keeps both her and P's cost savings from settlement), and when bargaining power is symmetric ($\alpha = 1/2$), the ANB settlement is identically the SNB settlement in Example 6.

Intuitively, the work of variable bargaining power in the ANB solution is to get away from the SNB solution's tendency to split things evenly in many cases. One might wonder whether backing away from a presumption of equality is good or bad. On one hand, allowing for asymmetric bargaining power provides a lot of flexibility relative to the SNB approach, and this may increase the realism of the model. On the other hand, the ANB solution could possibly be too flexible. Any Pareto efficient bargaining outcome can be explained as the result of *some* set of bargaining power values, so the ANB solution is in some respects not much different than the (almost) useless solution we intuited in Section 2.1.3.

2.2.2 *The Concept of Bargaining Power*

If it seems like the concept of bargaining power was introduced quickly and without any real motivation, that is because it was. Bargaining power (at least in the Nash bargaining sense of the term) is usually presented as an operational concept, not a structural feature in the model of bargaining. The idea is that some complicated set of real world factors causes a difference in relative bargaining power, and that we simply represent the resulting disparity in bargaining capacity in a convenient number form. For example, if years of experience and an inherent gift for persuasion make A twice as good at bargaining as B, then we can capture the combined effect of all these influences by saying that A has relative bargaining power of $\alpha = 2/3$ and B has relative bargaining power of $1 - \alpha = 1/3$.

Although it does a nice job of demonstrating the abstract concept of relative bargaining power, the forgoing example is also strongly objectionable. How would we ever know in practice that A is "twice as good at bargaining" as B, and what, for that matter, does "twice as good at bargaining" even mean other than in the circular sense of defining the distribution of relative bargaining power (α and $1 - \alpha$) between A and B? Sadly, economists do not have any particularly satisfying models to explain the nebulous concept of bargaining power, and research too often either relegates the concept to tautological abstraction (see, e.g., Svejnar 1986), or conflates it with asymmetries in preferences or disagreement outcomes that are already captured in other parts of the SNB solution and thus not properly bargaining power in our sense of the term (cf. Inkpen and Beamish 1997).[19]

This is not to say that the ANB concept of bargaining power is entirely meaningless. First, the abstract representation of relative bargaining power may reflect some strategic advantage conferred on one party or the other by the structure of the bargaining process (Binmore et al. 1986; Rubinstein 1982; Stahl 1972). Second, it may reflect a disparity in participant conviction owing to certain differences in the beliefs (Binmore et al. 1986) or to differences in relative patience (Binmore 2007, pp.

19 See Binmore et al. (1986) for further discussion of the inappropriateness of disagreement-value and preference asymmetries to the ANB solution concept of bargaining power.

252–53). Third, relative bargaining power may reflect certain forms of incomplete information (cf. Harsanyi and Selten 1972). Fourth, it may reflect human differences in the bargaining capacity or persuasiveness of the participants;[20] this factor seems intuitively plausible, but also comes uncomfortably close to untestable tautology. Fifth, relative bargaining power may reflect other context-specific factors that fall outside of the simple models of bargaining studied here.

Example 10 (Computing Relative Bargaining Power)**.** In some toy cases, a simple formula may exist to represent relative bargaining power. For example, Binmore et al. (1986) present a model of bargaining in which A and B take turns proposing divisions of a pie until agreement is reached, with A waiting Δ_A seconds before getting to respond to a proposal, and with B waiting Δ_B seconds. In this context, the ANB solution would have relative bargaining power given by $\alpha = \Delta_B/(\Delta_A + \Delta_B)$ (Binmore et al. 1986, p. 187). Few real-world scenarios provide a clean computational result like this.

Of the potential sources of bargaining power asymmetries listed above, the structure of the bargaining process has been the subject of the most research, and its influence is probably the best understood. Presentation of the structural approach to bargaining in the following section is in large part devoted to exploring disparities in bargaining power that arise from the structure of bargaining itself. As subsequent discussion will reveal, the effect of the rules of bargaining on the set of reasonable outcomes can be profound.

20 Care must be taken not to conflate human differences in bargaining capacity with other aspects of a model of bargaining. For example, one might claim that negotiations between a large corporation and an indigent customer are often characterized by inherent differences in bargaining capacity (e.g. Kessler 1943, p. 632). This would be confusion of concept if the focus was on relative wealth (implicating the value of a disagreement outcome) or limited mental capacity (possibly implicating the individual rationality axiom). A better analogy would be the difference between an experienced salesperson and an inexperienced customer (though even here differences in information may implicate alternative bargaining power factors).

2.3 THE STRUCTURAL APPROACH

As illustrated in the previous section, the axiomatic approach to bargaining disengages from the structure of the bargaining process to instead focus on the outcome of negotiation. This gives the axiomatic approach astonishing generality insofar as its results can be applied to a wide range of bargaining processes. It also limits the axiomatic approach insofar as an exclusive focus on outcomes precludes the solution from taking into account potentially important features in the structure of bargaining. The structural approach to bargaining represents the flip side of axiomatic reasoning. In a structural approach, inferences about the outcome of negotiation are drawn directly from the bargaining process: focus in on the rules of interaction and communication under which participants operate.[21]

This section traces out the theory of several simple but important structural models of bargaining. Each of the models—or *games* as they are more typically referred—has grown out of the expansive research progeny of the Rubinstein (1982) and Stahl (1972) structural bargaining models. Subsequent material in this section describes and analyzes the *dictator game*, *ultimatum game*, and *alternating offers game* as applied to the two prototypical bargaining problems introduced in Section 2.1. As in the previous section, an emphasis on accessibility and intuition prevents the following material from exploring some of the more esoteric mathematical issues implicated by these models of bargaining. The

21 In a truly unfortunate evolution of terminology, what I call the axiomatic approach to bargaining is often termed *cooperative bargaining* and what I call the structural approach is often termed *non-cooperative bargaining*. This terminology reflects a doctrinal distinction in the underlying theory of cooperative and non-cooperative game theory, but to especially misleading effect in a bargaining context. The important distinction between the two approaches is emphatically *not* whether participants are being cooperative or non-cooperative in negotiations: all bargaining problems involve *both* cooperative and non-cooperative components—that's what defines a bargaining problem! Rather, the important distinction is whether the approach engages in an axiomatic derivation of the bargaining solution, or in an explicit effort to model the structure of bargaining, and from this model to infer the likely outcome of negotiations. At any rate, the reader should be aware of this difference in terminology when consulting outside sources.

reader interested in a more technically rigorous presentation may consult Osborne and Rubinstein (1990), Kreps (1990), Gibbons (1992), and Napel (2002) among many others.

2.3.1 *The Dictator Game*

About as simple as a structural bargaining model can get, the *dictator game* is so trivial that it may not even satisfy the definition of bargaining suggested in Section 1.1. In this (appropriately named) model of bargaining, party A gets to decide the outcome of negotiations and party B gets to deal with it. The presentational choice of naming party A as the advantaged participant is obviously arbitrary, and the following reasoning applies analogously if B is the participant who gets to decide the outcome.

Dictator Game. The dictator game is a bargaining structure in which one participant has full and unilateral control over the choice of outcome.

The theoretic solution to the simple structure of the dictator game is correspondingly trivial. As long as A exhibits individual rationality (p. 14), the outcome of bargaining will be A's most preferred outcome. To keep analysis simple, we can continue the running assumption that A and B have strictly pecuniary preferences. Under this assumption, the outcome of the dictator game corresponds to complete appropriation of any benefits generated by agreement. This point is illustrated in the following example.

Example 11 (Dictator Game Solution to the Pie Division Problem)**.** In the pie division problem, if A is in the dictator's position, he will choose his most preferred outcome. That is, he will take the whole \$1 for himself, leaving B with \$0. If B is given the dictator position, results are just the opposite: B will take the \$1 pie for herself, and will leave A with \$0.

This result should look familiar. It is exactly the outcome that the ANB solution predicts when the party in the dictator's position is understood to have all of the relative bargaining power. This makes sense:

who could possibly have less bargaining power than the victim of the dictator's unilateral decree? There are, however, important difference between the dictator game and situations where one party has all the relative bargaining power.

Note, for example, that we have not even attempted to apply the dictator game structure to the settlement bargaining problem. The explanation for this omission is that the dictator game just doesn't make much sense in the settlement bargaining context. Since the dictator has unilateral authority to draft any settlement agreement (i.e. to choose any value of s), either P or D could just demand 100% of the other party's income irrespective of litigation costs or the potential trial verdict. Because the dictator game provides no opportunity whatsoever for disagreement, not even the value of disagreement outcomes (a constraint on full bargaining power scenarios) limits the dictator's control of the outcome.

The reason for studying the dictator game in this section is not that it seems like a widely applicable structure for bargaining. In most western countries, substantial legal obstacles exist to prevent one party from dictating the outcome of another without at least allowing the disadvantaged party the option of declining the outcome or refusing to participate. The dictator games is instead included because it provides a helpful point of reference when studying other more interesting structural bargaining games.

2.3.2 *The Ultimatum Game*

The *ultimatum game* is in many respects similar to the dictator game. In this model of bargaining, party A makes a single *take-it-or-leave-it* offer for the agreement outcome. The difference, relative to the dictator game, is that party B has the option of rejecting A's offer. Party B is otherwise like the disadvantaged participant in the dictator game: i.e. B never gets an opportunity to propose an agreement outcome herself. As before, the assignment of advantage/disadvantage to A and B is completely arbitrary here.

Ultimating Game. The ultimatum game is a bargaining structure in which one participant has a single opportunity to propose an agreement

outcome. The other party must then decide whether to accept the proposed agreement (instituting it as the outcome), or reject the proposed agreement (resulting in the disagreement outcome for both participants).

Although the structure of the ultimatum game is only slightly more complicated than that of the dictator game, the changes make solving for reasonable play considerably more involved. Throughout the following, it is important to remember that the assumed structure of the ultimatum game is critical. A take-it-or-leave-it offer means exactly that: it represents a point in the game where the *only* options of the responding participant are complete acceptance or complete disagreement. Put another way, it represents a binding commitment that precludes *either* participant from engaging in subsequent negotiations.

The concept of reasonable play is much different in the ultimatum game than it is in the dictator game. Because the outcome of the dictator game was unilaterally determined by the dictator, the only filter needed to solve for reasonable play was individual rationality. In the role of the dictator, *A* would simply choose the outcome he most preferred. There's no strategy involved in a unilateral choice. In contrast, the outcome of the ultimatum game is determined by the *combination* of *A*'s choice of offer and *B*'s decision whether to accept or reject the offer. In the role of the ultimatum game proposer, *A* can't only be thinking about what outcome he most prefers—he also needs to worry about the possibility of *B* rejecting the proposed outcome. The choices facing *A* and *B* in the ultimatum game thus depend in part on the strategy adopted by the other participant.

What does this mean for reasonable play in the ultimatum game? It suggests that "reasonable" may be best understood as an *equilibrium* concept. Intuitively, since what is reasonable for *A* depends on what *B* is doing, and since what is reasonable for *B* depends on what *A* is doing, we should be focusing our attention on cases in which the strategies of *A* and *B* are reasonable *at the same time* (i.e. are in equilibrium). This is fine in the abstract, but to get any practical traction on the problem, we need a concrete definition of what it means for the strategies of *A* and *B* to be simultaneously reasonable.

It makes sense to start with *Nash equilibrium*—the most widely applied equilibrium concept in the study of strategic games.[22] (Be careful not to confuse the Nash equilibrium concept of this section with the Nash bargaining solution described in Section 2.2; they have the same author, but are distinct ideas.) To oversimplify somewhat, a Nash equilibrium results when a pair of strategies are *stable* in the sense that no individual participant regrets his or her strategy in light of the strategies adopted by all of the other participants.[23]

Nash Equilibrium. Strategies constitutes a Nash equilibrium if no participant has a *unilateral* incentive to change his or her strategy, given the strategies of the other participants.

Armed with the Nash equilibrium concept, we can finally begin the search for reasonable play in the ultimatum game. So what does Nash equilibrium say about the range of reasonable equilibria here? Depressingly little. As the following example illustrates, it is remarkably easy to find Nash equilibria in the ultimatum game. In fact, there exist Nash equilibria to explain nearly any bargaining outcome.

Example 12 (Nash Equilibria in the Ultimatum Pie Division Game)**.** In the context of the pie division problem, assume that A makes an ultimatum offer for division of the pie and that B decides whether to accept or reject the offer. Any arbitrary division $0 \leq x^* \leq 1$ is supportable as a Nash equilibrium under the following strategies:

(1) A's strategy is to propose taking $\$x^*$ of the pie for himself,

(2) B's strategy is to reject any offer $x > x^*$ and to accept any offer $x \leq x^*$.

To see that these strategies constitute a Nash equilibrium, it is sufficient to note that neither A nor B has any individual incentive to

22 For original proofs, see Nash (1949) and Nash (1951).

23 The reader can find precise but still generally approachable definitions of the Nash equilibrium in Kreps (1990), and Gibbons (1992) among others.

change strategies.

(1) A only hurts himself by unilaterally switching to an offer of less than x^* (which will be accepted by B but will leave A with less pie than before). A would also not want to unilaterally switch to an offer of more than x^* because B's strategy is to reject any such offer, so A would be causing a switch from agreement (where he gets $\$x^*$) to disagreement (where he gets \$0).

(2) B gains nothing from unilaterally switching to accept any offer less than x^*, because her current strategy leads her to accept A's offer anyway. B would also not want to unilaterally switch to rejecting any offer greater than x^* because A's strategy is to propose x^*, which means B will reject the offer and cause a switch from agreement (where she gets $\$1 - x$) to disagreement (where she gets \$0).

Finally, note that a completely analogous result obtains when B makes the take-it-or-leave-it offer and A decides whether to accept or reject the offer.

There's no need to repeat the exercise of Example 12 for the settlement bargaining problem because the result is essentially the same. In short, any Pareto efficient outcome to either bargaining problem is supportable as a Nash equilibrium. This is discouraging: we've added a good deal of structure and a whole lot more complexity to our analysis of bargaining, but in the end we have nothing new to show for it. Although this despairing sentiment is certainly valid to a point, outright forfeiture is premature.

The reason for hope is that the Nash equilibrium concept isn't making full use of the ultimatum game's bargaining structure. The game involves two sequential actions—(1) A makes an ultimatum offer, and (2) B decides whether to accept or reject the offer—which the Nash equilibrium is treating as effectively simultaneous moves. By treating sequential actions as though they were simultaneous, the Nash equilibrium concept may be allowing some sets of strategies to appear more reasonable than they really are.

To make use of the sequential structure of bargaining in the ultimatum game, we need a refinement of the Nash equilibrium concept. We need the concept of *subgame perfect equilibrium*. Again somewhat oversimplifying the definition, a *subgame* can be understood to be the portion of the bargaining game remaining to be played in every step of a sequential bargaining process. The ultimatum game thus has two subgames: (1) the entire bargaining game, and (2) the part of the bargaining game remaining to be played after A announces his proposed agreement. Subgame perfection rules out any Nash equilibria for the entire game that are not also Nash equilibria in every subgame.

Subgame Perfect Equilibrium. A set of strategies constitutes a subgame perfect equilibrium if it also constitutes a Nash equilibrium in every subgame.

An intuitive way to think about the subgame perfect equilibrium refinement is as filter for removing non-credible threats. For example, in most of B's equilibrium strategies in Example 12, B threatened to reject any take-it-or-leave-it offer lower than a certain value. This was an effective strategy insofar as it allowed B to demand part of the pie for herself (albeit, without actually communicating that demand in the form of a formal offer). But were those threats credible? The subgame perfect equilibrium concept suggests they were not. To see why, consider the following example.

Example 13 (Non-Credible Threats in the Ultimatum Pie Division Game)**.** In the context of the pie division problem, consider the Nash equilibrium where B rejects any offer $x > \$0.25$ and where A correspondingly proposes $x = \$0.25$. B's strategy fails the test of subgame perfection; it isn't credible. To see the problem, suppose A were instead to make a take-it-or-leave-it offer of $x = \$0.50$, which B's strategy threatens to reject. It is easy for B to threaten mutual destruction at the start of the bargaining process, but when A's offer of $x = \$0.50$ arrives and B must choose between acceptance (yielding her an agreement outcome of $1 - x = \$0.50$) or rejection (yielding

her the disagreement outcome of $0), individual rationality requires *B* to *accept* the offer. Put another way, her threat of rejection was not credible (not a Nash equilibrium in the subgame following *A*'s offer) and so is not actually a constraint on *A*'s ability to propose $x > \$0.25$.

As may already be clear in the wake of Example 13, the refinement introduced by subgame perfection equilibrium does violences to many Nash equilibria in the ultimatum game. In fact, the only Nash equilibria that survive the butcher's knife are those in which the responding participant's threat of rejection is credible by reason of bumping up against that participant's disagreement outcome. Even without the full power of a dictator, the participant with the ability to make a take-it-or-leave-it offer is thus able to effectively monopolize all of the relative bargaining power in the ultimatum bargaining game.

Example 14 (Subgame Perfect Equilibrium in the Ultimatum Pie Division Game)**.** In the context of the pie division problem, assume that *A* makes an ultimatum offer for division of the pie and that *B* decides whether to accept or reject the offer. Working backwards from the subgame in which *B* receives an arbitrary offer x, we may infer that any $x \leq 1$ will be accepted by *B* because individual rationality compels acceptance (for a payoff of $\$1 - x \geq \$0$) rather than rejection (for a payoff of $0). Since *A* is capable of making this exact same inference about *B*'s non-credible threat of rejection, *A* will rationally elect to make a take-it-or-leave-it offer of $x = 1$, which *B* will then accept as predicted.[24] Analogous strategies apply when the roles of *A* and *B* are reversed.

24 The treatment of indifference in this material may trouble some readers. The (entirely reasonable) objection is that *B* has no clear incentive to accept an offer of $x = 1$, as suggested in the example, because the value to *B* of agreement ($\$1 - x = \$0$) is exactly the same as the value to *B* of disagreement ($0). In responding to this concern, the conventional excuse is to explain that *A* can give *B* a "crumb" more than $0 to break the indifference complication. But this answer only delays the inevitable problem: either the crumb itself is divisible (in which case the problem remains), or the crumb is indivisible (in which case we have violated our initial assumption that the pie is infinitely divisible). The more honest answer is that things get analytically complicated

Example 15 (Subgame Perfect Equilibrium in the Ultimatum Settlement Bargaining Game)**.** In the context of the settlement bargaining game, the subgame perfect equilibrium depends on which of the parties has the ability to make the ultimatum offer.

(1) (P makes the ultimatum offer) Working by backward induction, the only settlement offers that D can credibly commit to reject are $s > v + k_d$. Knowing this, P can propose that the parties settle at $s = v + k_d$: i.e. D will settle for exactly the value of her disagreement outcome, and all the cost savings from settlement go to P.

(2) (D makes the ultimatum offer) Again by backward induction, D can infer that the only settlement offers that P could credibly reject are $s < v - k_p$. Knowing this, D can propose to settle for $s = v - k_p$; this leave P with his disagreement outcome value and allows D to acquire all of the cost savings from settlement for herself.

By now the similarity of the dictator game and the subgame perfect equilibrium to the ultimatum game should be apparent. After ruling out non-credible threats of rejection, the ability to make a take-it-or-leave-it offer gives the advantaged participant in the ultimatum game almost as much power to control the bargaining outcome as is held by the advantaged participant in the dictator game. This is an important insight about the effect of bargaining structure on relative bargaining power in the ANB sense of the term (see Section 2.2). The participant capable of making an ultimatum offer has 100% of the relative bargaining power, and thus can (in theory) extract 100% of the benefits of bargaining.

This conclusion is accurate as far as things go, but may be glossing over some important points. First, as cautioned previously, a take-it-or-leave-it offer is not simply a blustered ultimatum without a credible threat to end further negotiation. A lawyer who brings an "ultimatum offer" to the opposing council with several months left to go before trial

when we try to take on this admittedly distracting but nonetheless esoteric concern, and that the value of doing so would be negligible for present purposes.

is probably not making a take-it-or-leave-it offer. The problem is lack of credibility: the opposing council will realize that nothing is really preventing subsequent negotiation.

Second, the narrative that introduced subgame perfect equilibrium was expressly intended to persuade the reader of the concept's sensibility. But is the subgame perfection filter really a reasonable assumption about how bargaining participants behave in practice? The inventor of subgame perfect equilibrium, Reinhard Selten, himself only regarded the concept as an "ideal theoretical construct" of potentially limited practical predictive power (Binmore 2007, p. 105). For one thing, intuition instructs that humans are not particularly good at backward induction (see Thaler 1992, pp. 32–35), so it may be risky to base an equilibrium concept on this mechanism. More importantly, it is not necessarily obvious that a short temporal delay between offer and acceptance would be enough to make the responding participant abandon a threatened rejection in all cases. Suppose B announces (non-credibly in the subgame perfect sense) that she will reject an offer of outcome X if it is made; one second later, A proposes outcome X. Is it a plausible characterization of human behavior to say that B will *always* accept the offer?

The takeaway message from the ultimatum game is unlikely to fit on a bumper sticker. To the extent that we are persuaded by the subgame perfection refinement, the ultimatum game stands for the proposition that the structure of bargaining alone can be sufficient to confer substantial relative bargaining power on a given participant. On the other hand, it is not obvious that the sequential timing of offer and acceptance should always be expected to hold much weight in ruling out Nash equilibria of the bargaining game. At the more agnostic level of Nash equilibrium, the structure of bargaining in the ultimatum game says very little about the relative distribution of bargaining power.

2.3.3 The Alternating Offers Game

In conversations with students, I've found that the extreme parsimony of the ultimatum game can make the theory hard to swallow. Many students are appropriately skeptical about a model of bargaining in which only a single participant is allowed make an offer for the agreement outcome;

they would be much more comfortable with a model exhibiting even as small a change as giving the other participant a single opportunity to make his or her own offer for the outcome of bargaining. The *alternating offers game* is such a model. In the following material, we will study a game involving two alternating offers, but results generalize transparently to longer sequences as well.[25]

Two-Stage Alternating Offers Game. The two-stage alternating offers game is a bargaining structure in which participants take turns proposing an agreement outcome. In the first stage of the game, party *A* offers an agreement outcome; party *B* can either accept the offer (instituting it as the outcome), or reject the offer (moving the game to the second stage). If the second stage of the game is reached, party *B* offers an agreement outcome; party *A* can either accept the offer (instituting it as the outcome), or reject the offer (resulting in the disagreement outcome for both participants).

The two-stage alternating offer game easily generalizes to an n–stage game by simply adding additional stages of alternating offers. The important point to recognize about the alternating offers game is that the final stage is functionally an ultimatum game in which the proposing participant is able to make a take-it-or-leaving it offer to the responding participant. This relationship between the ultimatum and alternating offers games greatly simplifies our treatment of the latter. Just as in the ultimatum game context, we will rely on the subgame perfect equilibrium concept to learn as much as possible from the structure of the game. This involves reasoning by backward induction (see Examples 14 and 15). Intuition for the approach is easily gained by application to the pie division problem.

25 The generalization to sequences of three or more alternating offers follows closely analogous reasoning. In the limiting case where participants are able to keep proposing alternative offers ad infinitum, the mechanical solution of the bargaining problem is a little different. Rubinstein (1982) considers this type of infinite-horizon bargaining. Using a simplifying property of bargaining introduced by Shaked and Sutton (1984), accessible intuition for the solution is provided by Gibbons (1992, pp. 70–71). More rigorous approaches are provided by Kreps (1990, pp. 556-60), and Napel (2002, pp. 30–44) among others.

Example 16 (Subgame Perfect Equilibrium in the Alternating Offers Pie Division Game)**.** In the context of the pie division problem, assume bargaining follows the two-stage alternating offers model with A making the first offer and B possibly making the second offer. The difference in outcome between the following two cases is instructive.

(1) (Stable Pie) First assume that the pie is the same size in both stages. If the second stage of the game is reached, B has the opportunity to make a take-it-or-leave-it offer. We know from study of the ultimatum game that B will be able to demand the whole pie at this point, and that A will be forced to acquiesce. Reasoning backwards, A must realize that B won't accept any offer of $x > 0$ because the payoff to B ($\$1 - x$) will always be less than the payoff B gets by rejecting A's offer then using her ultimatum advantage to collect the full pie ($\$1$). The only option is for A to offer $x = 0$.

(2) (Shrinking Pie) Now assume that the pie shrinks to a size of $0 \leq \delta < 1$ if no agreement is reached by the end of the first stage of bargaining: i.e. the pie becomes less valuable (or maybe more stale) the longer it takes the participants to reach agreement. Now the value to B of making an ultimatum offer in the second stage is only $\$\delta$ (the full size of the shrunken pie in the second stage of the game). Knowing this, A can offer to keep $x = \$1 - \delta$ for himself. B will accept this offer, because the value of acceptance to her ($\$1 - x = \$\delta$) is the same as she would get from rejection ($\$\delta$).

The interesting case for the alternative offers game is thus when there is some cost to reaching a delayed agreement. Without delay costs, the alternating offers game is completely characterized the by ultimatum game in the final stage of bargaining. This makes sense: with no cost to waiting until the final stage of bargaining to reach an agreement, all relative bargaining power is determined by the structure of bargaining in the final period. With delay costs, however, the alternating offers game

provides for a more moderate distribution of bargaining power than does the ultimatum game. In the two-stage alternating offers game, for example, the second-mover gets an amount of pie equal to the value of being able to make a stage-two take-it-or-leave-it offer, while the first-mover gets an amount of the pie equal to what it would cost the second-mover to get to the second stage of bargaining.

In the pie division example, it didn't really matter why the value of the pie was decreasing over time. The decrease in value could be seen as an explicit cost (e.g. the size of the pie is reduced to δ by a third party coming in and taking some of the pie off the table) or alternatively, could be thought of as reflecting the participants' impatience. An important property of the settlement bargaining game is that it does not share this duality of interpretation. In the settlement context, it matters a great deal whether delay costs are understood to be explicit costs of bargaining or a reflection of parties time preferences.[26]

Example 17 (Subgame Perfect Equilibrium in Alternating Offers Settlement Bargaining)**.** In the context of the settlement bargaining game, consider a two-stage alternating offers model where P makes the first settlement offer and D makes the second offer. The following examples show how different delay costs affect the outcome.

(1) (Explicit Negotiation Costs) Suppose that in addition to litigation costs (k_p and k_d), the parties incur negotiation costs (c_p and c_d) if they are unable to settle the dispute before the second stage of bargaining. Working by backward induction, the second stage (ultimatum game) is characterized by D offering to settle for $s = v - k_p$ (see Example 15 if this isn't obvious). Realizing that

26 The time-value-of-money is a term often used to express the idea that money today is in some sense *better* than money tomorrow. There are many ways to see that this is probably accurate. First, money today can always be saved today and spent tomorrow, but not visa-versa. Second, money today can be invested in a savings instrument that pays interest tomorrow. Third, many people have an intuitive understanding that, at least when it comes to consumption habits, sooner is usually better. The time-value-of-money can often be represented by a multiplicative discount factor. For example, discounting at rate $0 \leq \delta < 1$, a payment worth x today is worth δx tomorrow, $\delta^2 x$ the day after tomorrow, etc.

D will have to pay c_d in negotiation costs to get to the second stage of negotiations, P can offer to settle in the first period at $s = v - k_p + c_d$. D accepts such a proposal, ending the game in the first period.

(2) (Inter-temporal Discounting) Now suppose there are no explicit negotiation costs, but instead P and D both discount the value of future payments at a rate of $0 \leq \delta < 1$: the idea is that a payment valued at $\$x$ in a given period would valued at $\$\delta x$ if delayed until the subsequent period. In the second stage of negotiations, D will offer to settle at $s = \delta(v - k_p)$, the discounted value to P of waiting to get the trial verdict outcome. Knowing this, P can offer in the first stage to settle for $s = \delta^2(v - k_p)$, the discounted value to D of waiting to settle until the second stage. D accepts such a proposal, ending the game in the first period.

Note, as always, that analogous results obtain when D makes the first offer and P the second.

The outcomes of the two scenarios in Example 17 are subtly but importantly different. When the delay cost of negotiation is an explicit cost (i.e. c_p and c_d), the alternating offers game results in P and D sharing the gains to be had from early settlement. The total cost savings from avoiding litigation ($k_p + k_d$) go to D, while the total cost savings from avoiding unnecessary negotiations ($c_p + c_d$) go to P. This is analogous to the result in Example 16. When the delay cost of negotiation is a time-value-of-money concept, however, all the relative bargaining power remain concentrated in D, who ultimately settles for 100% of the available bargaining surplus. P settles for the minimum amount needed to avoid violating individual rationality. Intuitively, the fact that D is actually *paying out* money means that D benefits from inter-temporal discounting to exactly the same degree that P loses value from delay. In the settlement bargaining context, the time-value-of-money is a delay cost to P but is a delay *benefit* to D.

A few remaining comments may help to clarify the lesson of the alternating offers game. First, in every case in which delay is costly to the bargaining participants, subgame perfect equilibrium requires that

settlement occur as soon as possible—no outcome involving delayed agreement is "reasonable" under the subgame perfect equilibrium concept. Second, in some (but not all) cases, the alternating offers model of the bargaining process results in a more moderate distributions of relative bargaining power than does the ultimatum model. Third, because we have been focusing exclusively on what outcomes appear reasonable under the concept of subgame perfect equilibrium, all the concerns about the subgame perfection filter raised previously in discussing the ultimatum game remain valid. Fourth, without the filter of subgame perfection, we have essentially the same glut of Nash equilibria encountered in the ultimatum offer game context. In short, we leave the alternating offer structural bargaining model with some sharp statements about reasonable behavior, but also with many serious hesitations about exactly how reliable these statements may be.

2.4 FINAL THOUGHTS

The preceding sections of this part attempt to strike a balance between technical rigor on one hand and approachable simplicity on the other. In some instances, attention to this balance has compelled the omission of topics which, though not critical to the development of underlying intuition, are nonetheless helpful in thinking about the generality and application of economic bargaining models. Two topics in particular deserve at least summary treatment as we leave discussion of the theory of bargaining.

First, it should be noted that most bargaining models generalized beyond the one-dimensional (i.e. purely pecuniary) pie division examples explored in this part. This generality is important for cases where the lessons learned from economic models of bargaining are applied to more complicated real-world bargaining scenarios. An obvious example would be where P and D endeavor not only to agree on a monetary settlement transfer, but also to establish affirmative obligations that P or D accept as additional terms of a settlement agreement. The settlement example is itself just a special case of the complicated bargaining that goes into negotiating even a reasonably detailed contract instrument.

Basically all economic models of bargaining are capable of accommodating bargaining over multiple dimensions.[27] The theory is muddied, however, by the need for some way to comprehend trade-offs between different interests of the bargainers. For example, how much of a monetary settlement transfer would *P* be willing to forgo if *D* agreed to issue a public apology for her actions? This leads immediately to a discussion of utility theory—a topic which cannot be given satisfactory treatment within the space limitations of this study. The interested reader may consult Roth (1978), Malouf and Roth (1981), Rubinstein et al. (1992), and many others for an introduction to various concepts of utility and the ways they affect our understanding of the Nash bargaining solution. Structural bargaining models incorporate preferences over multiple dimensions transparently, but generally require a strong assumption that all bargainers' preferences are common knowledge.[28] When this is not the case, asymmetries in bargaining information can lead to results that are wildly different than those presented in this part (see generally Kennan and Wilson 1993).[29]

Second, it should be noted that the rather glib presentation of disagreement values in the bargaining models discussed in this part fails to emphasize the practical difficulty of determining what the appropriate disagreement outcome is in many cases. As a practical matter in modeling real-world bargaining environments, determining the appropriate disagreement outcome will often be a complicated process. Take the settlement bargaining problem, for example. The narrative in Section 2.1.2 stated that the disagreement outcome was a trial verdict. Is this obviously right? The trial verdict outcome is certainly the result of complete disagreement, but how would results change if *P* and *D* could easily

27 For a very early example, see Edgeworth (1881).

28 Kreps (1990, pp. 560–61) provides a helpful introduction.

29 It is a fair representation of the literature to say that economists are presently unsure exactly how the presence of asymmetric information influences empirical bargaining behavior. Roth (1995, pp. 312–322) provides a helpful survey of the experimental economic literature on this topic, and the interested reader might compare the conclusions of Forsythe et al. (1991) with Rapaport et al. (1995) to get a feel for differences in interpretation. Even at a theoretical level, it is not entirely obvious how asymmetric information should be expected to affect behavior in many cases (see, e.g., Gul and Sonnenschein 1988).

reach some intermediate point of agreement. For example, suppose both *P* and *D* agree that a fair settlement involves at least a transfer of $1,000, but disagree about how much more than $1,000 would be an appropriate agreement amount. In this case, is the trial verdict outcome or settlement at $1,000 the more appropriate disagreement outcome value?

As Binmore (2007) persuasively argues, the appropriate concept may often be a *breakdown point* rather than a *disagreement point*. Put another way, if both parties can agree to some partly satisfying outcome in any event, with disagreement only as to additional provisions or as to some auxiliary pie to be divided, then the appropriate reference point for bargaining impasse may actually be the partly satisfying breakdown outcome (where participants are at least able to agree on some parts of the outcome) as opposed to the full disagreement outcome (where no agreement is reached at all).

THE BEHAVIOR OF BARGAINING

This part of the study presents the broad strokes of several economic models of the behavior of bargaining. The first section discusses how the theoretic models of bargaining in Part 2 compare to empirical evidence about bargaining behavior. The second two sections present focal point and behavioral models of bargaining that help to supplement the theoretic models of bargaining described in the previous part. These research areas tend to overlap, and the reader will no doubt recognize several themes that run throughout the following sections.

3

3.1 EMPIRICAL EVIDENCE

Experimental economics is a branch of research that seeks to test economic theories by observing how actual humans behave in closely controlled situations. In economics experiments on bargaining, for example, human subjects are monitored as they play real-money versions of the dictator game, ultimatum game, etc. Empirical evidence supports the economic theory of bargaining in some respects, but not in others.[30] Because axiomatic models of bargaining are notoriously difficult to test (but cf. Malouf and Roth 1981), the following material is mainly limited to study of the dictator game, ultimatum game, and alternative offers game.

3.1.1 The Dictator Game

Among structural bargaining models, the dictator game is by far the simplest. Individual rationality alone leads to the conclusion that the advantaged participant (dictator) should unilaterally select whichever outcome is personally most desired. Thus, in the dictator game version of the pie division problem, an assumption that bargaining participants have

30 This is only a cursory treatment of the extensive experimental economics literature on bargaining. For more detailed surveys, see Davis and Holt (1993), Roth (1995), and Güth (1995) among others.

strictly pecuniary preferences leads to the prediction that the dictator should simply take the entire pie for him or herself. Do empirical data support this assumption? Not really.

Consider the results reported by Forsythe et al. (1994), who monitor human subjects as they interacted in a series of real-life dictator games to divide a $5 pie. The researchers find that although the most common decision of the dictator is to take the entire pie (36% of decisions), around 30% of the time the dictator leaves $1 for the other party, about 20% of the time the dictator elects to divide the pie evenly, and a small number of times the dictator actually gives more than half the pie to the disadvantaged participant. These results are fairly representative. For example, Kahneman et al. (1986) report that when given a choice between (1) splitting a $20 pie evenly or (2) keeping $18 and giving $2 to the disadvantaged participant, about 76% of dictators elect to split the pie evenly.

Empirical data on the dictator game exhibit a few noteworthy sensitivities. In the direction of increased generosity, experiments conducted with small-scale societies (e.g. villages in the African bush) find fewer proposers willing to keep the entire pie (Ensminger 2004; Marlowe 2004). In the direction of decreased generosity, Hoffman et al. (1994) report that dictator selections become less generous as the anonymity of experimental subjects increases. Also Cherry et al. (2002) find that divisions are substantially less generous when the dictator perceives the pie to be an earned resource (see also Hoffman et al. 1994).[31]

The dominant interpretation of these data is that they reveal a nonpecuniary taste for "fairness" in bargainer preferences (see, e.g., Ochs and Roth 1989, p. 23; Thaler 1992, pp. 34–35; Camerer and Thaler 1995).[32] Fairness in this sense is usually thought to mean inequity aversion in the division of payoffs from bargaining (see, e.g., Fehr and Schmidt 1999; Goeree and Holt 2000).[33] Individual preferences appear to say "more

31 Cherry et al. (2002) frame the pie as an earned resource by setting the size of the pie according to the dictator's performance in answering a series of *ex ante* quiz questions before bargaining begins.

32 For a detailed treatment of the technical meaning of other-regarding or empathetic preferences, see Harsanyi (1986, ch. 4).

33 For an experiment addressing fairness with more than two participants, see Güth and van Damme (1998).

pie is preferred to less, except when the result would leave too little pie for the other party."

This more mature concept of bargainer preferences seems intuitively correct,[34] but raises a number of disquieting concerns. First, the concept of fairness is difficult to articulate precisely, and seems to vary by individual (see, e.g., Andreoni et al. 2003). Second, the concept of fairness appears to be context specific, depending, for example, on both the relative wealth of the participants and the context or *framing* of the bargaining problem.

Example 18 (Fairness Concept in the Settlement Bargaining Problem)**.** Unlike the abstract pie division problem, where a completely fair outcome is pretty clearly a 50/50 split of the pie, the settlement bargaining problem admits no immediately obvious "fairness" concept. In the settlement bargaining problem, *P* has been damaged in a way that (he believes) provides him with a legal right to recovery, and *D* (who almost certainly disputes *P*'s actual entitlement to recovery) is asked to produce a compensatory payment from her own earned stock of wealth. After several years of thinking about the problem, I remain uncertain what the concept of fairness is in this context. Does a fair settlement focus on equalizing *P* and *D*'s relative wealth, or just compensate *P* to the extent of his injury? In the latter case, does a fair settlement compensate *P* for the full amount of the injury, or just for the net value of the trial verdict (i.e. damages minus litigation costs)?

Third, it is important to note that—rather than representing some abstract and fixed concept in the world—the "fairness" of an outcome may be largely a function of participant expectations, themselves a function of the outcomes that participants have previously encountered in related bargaining situations in their lives. What is fair to a given participant

34 In an interesting combination of medical and economic experimentation, Sanfey et al. (2003) observe that both receipt and rejection of inequitable offers in an ultimatum game context cause heightened neurological activity in an area of the brain associated with emotion.

may thus be a reflection of what outside experience has taught that participant to expect (see, e.g., Roth and Schoumaker 1983; Binmore et al. 1993), and this concept of fairness or expected outcome may evolve over time, particularly if a particular bargaining game is played repeatedly (see, e.g., Binmore 2007, pp. 15, 64).[35]

It is not necessary to resolve here the exact meaning of fairness in a bargaining context. What is important to note is that fairness concerns appear to be an important factor in understanding empirical data on the outcome of the dictator game, and can are certain to be at least as influential in more interactive bargaining processes as well. Questions of fairness also implicated focal point models of bargaining behavior as discussed in Section 3.2.

3.1.2 The Ultimatum Game

The theory of reasonable play in the ultimatum game is a sticky issue. At the most agnostic level, any division of the ultimatum game pie can be supported as the result of an appropriate set of Nash equilibrium strategies. If we assume that participants in the ultimatum game employ backward induction in their strategy formation, then a proposal to take the entire pie and acceptance of this proposal are the unique subgame perfect equilibrium of the game. But as noted previously, the concept of subgame perfect equilibrium places strong restrictions on the way that participants form their bargaining strategies, and the resulting equilibria may simply be sharper than we can reasonably expect in many interesting bargaining contexts. Which theory of reasonable play do the available data support? It's hard to say.

Starting at the conceptually easier stage of the responder's acceptance/rejection decision, empirical data fail to support the proposition that all proposals will be accepted. In laboratory experiments with paid subjects, for example, Güth et al. (1982) find that responders in ultimatum games reject proposals (causing both participants receive $0 disagreement payoffs) in favor of accepting small to even moderately generous

35 Going even further, Binmore (2005) suggests that ethics themselves may be best understood to be a reflection of the long-run stable expectations that emerge from repeated social interactions (i.e. bargaining situations in a society).

payoffs that involve inequitable divisions of the pie. Framing a $10 pie ultimatum game in terms of binding contingent demand questions (i.e. "if I were offered $1 – x, I would accept/reject the offer"), Kahneman et al. (1986) observe that average responders prefer to the disagreement outcome over acceptance of proposals that they keep as much as $2 of the pie.

Ultimatum game rejections are not mitigated by learning through repeated play (Roth et al. 1991), or by increasing the size of pie in order to make the disagreement outcome more painful (Forsythe et al. 1994; Hoffman et al. 1996),[36] and have been observed across a range of countries and cultures (Roth et al. 1991). One possible interpretation of such rejections is they are used by responders to punish the proposers of what are perceived to be inequitable offers. This hypothesis is supported by evidence that ultimating game rejections are less frequent when the responder knows the offer is being made by a computer rather than a human partner (Sanfey et al. 2003), and by alternative experiments in which third-party subjects demonstrate a willingness pay their own money in order to inflict punishments on the proposers of inequitable offers in ultimatum games (Kahneman et al. 1986).

Given this description of empirical data on acceptance/rejection decisions, what do experimental studies reveal about ultimatum game proposals? In an abstract pie division context, Güth et al. (1982) report that the most common ultimatum game offer is an equal (50/50) division of the pie. Qualitatively similar results have been observed in comparable experiments (Kahneman et al. 1986; Forsythe et al. 1994; Roth et al. 1991). The distribution of ultimatum offers is basically the same throughout: the most common offer allows the responder to keep around 40–50% of the pie, offers to keep less than 40–50% are made with decreasing frequency as one moves in the direction of a 0% offer, and a small number of proposers actually offer that the responder keep more than 50% of the pie.

The distribution of take-it-or-leave-it offers in the ultimatum game does appear sensitive to certain contexts. For example, experiments conducted with subjects from small-scale societies reveal substantial vari-

36 But cf. Slonim and Roth (1998), describing contrary results.

ation in offer generosity by society.[37] Re-framing the pie in a property-rights context (Hoffman et al. 1994), and restricting proposers from proposing exactly equitable offers (Güth et al. 2001) have also been found to induce substantial changes in the distribution of ultimatum offers.

So what do these data say about actual play in the ultimatum game? Observed bargaining outcomes obviously involve more equitable divisions of the pie than subgame perfect equilibrium would tend to predict. It would be nice to say that the available data clearly reject the subgame perfect equilibrium concept, but this is almost certainly wrong. As soon as one entertains the idea that proposers, responders, or both may have a taste for fairness, the sharp *leave nothing behind* prediction of the subgame perfect equilibrium gives way to a more flexible set of outcomes that are not obviously inconsistent with the observed data (cf. Goeree and Holt 2001, pp. 1409-412).

Example 19 (Revisiting the Subgame Perfect Prediction)**.** In light of the empirical evidence presented in this section, we can revisit the ultimatum game version of the pie division problem. Suppose B has preferences exhibiting inequity aversion. If B finds acceptance of an inequitable division sufficiently distasteful, B may rationally prefer the disagreement outcome (where both participants get a *common payment* of $0) to an acceptance outcome where she gets to keep a positive but inequitable portion of the pie. In this case B has a *credible threat* to reject sufficiently inequitable offers (even under the subgame perfect refinement). Realizing that B really will reject too uneven an offer, A's subgame perfect equilibrium strategy cannot still be to propose taking the entire pie for himself.

Empirical data on the ultimatum game provide two important lessons of practical value in bargaining situations. First, it would be a grave mistake to ever approach a bargaining situation without carefully thinking

37 Marlowe (2004, p. 176 and Figures 6.2, 6.3) notes that in experiments conducted with certain small-scale societies (e.g. the hunter-gatherer Hadza of Tanzania), the most common take-it-or-leave-it offer can be as little as 15-20% of the pie. Offers from other small scale societies look more like those of developed countries. Ensminger (2004) comments that, in small-scale societies, ultimatum offer generosity increases with the market-integration of the proposer.

through the "fairness" consequences of different bargaining outcomes. Neither purely pecuniary incentives nor fairness concerns explain the data as well as a mixture of the two (see Goeree and Holt 2000). Second, available data do tend to support at least a limited version of the bargaining-power theory suggested by the ultimatum game. While the most common division of the pie is admittedly an even split, far more ultimatum games end in outcomes favorable to the proposer than in outcomes favorable to the responder. The ability to make an ultimatum offer may not give quite the bargaining power held by a dictator, but it *does* obviously convey an appreciable advantage to the proposer.

3.1.3 The Alternating Offers Game

In the absence of delay costs (i.e. a shrinking pie), the alternating offers game is not very much different from the ultimatum game.[38] Once delay costs are introduced, however, the alternating offers game becomes more interesting. A particularly strong property of subgame perfection in the alternating offers game is that bargaining should never get past the first stage of negotiation. The first-stage proposer is expected to offer the first-stage responder (second-stage proposer) an amount equal to the payoff that would be received from being able to make a second-stage proposal; rejecting this offer can't possibly make the first-stage responder any better off, so the first-stage offer should always be accepted.

As an initial observation, the theme of experimental evidence on offers in the dictator and ultimatum games applies here as well: first-proposer offers do not track well against those we would expect to see under purely pecuniary preferences. Rather, first-proposer offers in two-stage alternating-offer experiments tend to be close to the subgame perfect prediction when the predicted offer is approximately fair (e.g. 50–75% of the pie), but tend to be closer to a fair division of the pie when the subgame perfect prediction involves a more highly inequitable outcome (Goeree and Holt 2000; Davis and Holt 1993, pp. 270–73).[39]

38 If this isn't immediately obvious, see Section 2.3 generally and Example 16 in particular.

39 First-proposer offers remain generous in alternating offers games with more than two-stages of negotiation, but the effect of game length on offer generosity can be complicated (Neelin et al. 1988).

Even given the relative generosity of first-stage offers in the experimental data, rejection of the first-stage offer is not uncommon. Around 15% of games involve first-stage rejections (Ochs and Roth 1989, Table 6). More interesting yet, as many as 65–86% of the resulting second-stage offers actually propose that the second-stage proposer get lower payoffs than would have been received from accepting the first-stage offer in the first place (Ochs and Roth 1989; see also Roth 1995). The dominant interpretations of these data are comparable to those suggested in discussion of the dictator and ultimatum games.

One remaining observation of interest is an empirical regularity sometimes referred to as the "deadline effect." In long-sequence multiple-stage alternating offer bargaining games with delay costs that are small (Güth et al. 2005) to zero (Roth et al. 1988; Gneezy et al. 2003), agreements frequently do not occur until, or just before, the final stage of bargaining. It's difficult to say with certainty what the practical implications of this empirical regularity might be, thought it is worth noting that settlement *on the courthouse steps* is often thought to characterize agreements in a settlement bargaining context (e.g. Spier 1992, p. 93).

3.2 FOCAL POINT EQUILIBRIA

It may seem odd that the search for reasonable bargaining outcomes in Part 2 did not begin with the simple question whether some outcomes are intuitively more plausible than others. In retrospect (or with a tiny amount of introspection), the 50/50 split in the pie division problem is just such an outcome. Equal division of the pie was, of course, shown in Section 2.2.1 to be the symmetric Nash bargaining solution to the pie division problem, but that isn't what makes the equal division outcome intuitively reasonable. Rather, it is intuitively reasonable because, among other things, the 50/50 division of the pie (1) accords with our background societal understanding of what would be a "fair" outcome under the circumstances, and (2) is exactly the kind of outcome that we would *actually expect to see* in a real-life analog of the pie division problem.[40]

40 Think, for example, about the way that children are generally instructed to share food, toys, etc, in western societies. The "golden rule," as children are taught, is to share mutually desired resources equally.

Intuitively reasonable agreements such as the 50/50 split in the pie division problem are what economists call *focal points* in the set of possible bargaining agreements. In his seminal work on focal point equilibria, Schelling (1980, pt. II § 4) argued that background norms, common experiences, common expectations, and other societally salient signals could serve a coordinating function by helping to highlight certain bargaining outcomes as particularly apt points for agreement.[41] The idea is that social cues, background norms, shared expectations, and other influences may sometimes work to focus participants' attention on a particularly obvious (focal) point of agreement (see also Roth et al. 1980).

There is unmistakable similarity between the focal point equilibrium approach described above and the subgame perfect equilibrium approach described in Section 2.3.2. Both approaches start with a hopelessly large number of apparently plausible bargaining outcomes and then proceed to prune out any agreements that fail to meet certain specified criteria. The subgame perfect equilibrium approach cuts out any agreements that involve non-credible threats of rejection; the focal point equilibrium approach cuts out agreements that are not focal in the above sense of the term. An important difference between the subgame perfect and focal point equilibrium approaches is that (unlike threat credibility) there is no really obvious definition of what makes a particular bargaining outcome focal.

To be clear up front, the economic conception of a focal point is far from crystallized. Research has, however, uncovered at least a few interesting properties of the concept. For one thing, agreements like the 50/50 split in the pie division problem appear to be focal either because of their symmetry (Kreps 1990, p. 554),[42] or because of their conformance with the related societal norm of fairness (cf. Camerer and Thaler 1995). Interestingly, the focality of the 50/50 split appears heavily dependent on the *exact* symmetry of the division. Güth et al. (2001), for example, find that if proposers in ultimatum-like games are prevented from offering

41 The focal point theory of Schelling (1980) has explanatory power in a wide range of what are commonly called *coordination problems*. Bargaining problems are an important special case of coordination problem.

42 Thinking this way gives additional weight to the symmetry axiom introduced in Section 2.2.

perfectly equal (50/50) divisions of the pie, then most proposers opt to offer strongly inequitable (85/15) divisions rather than close-to-equal (55/45) divisions. A plausible interpretation of this observation is that while an exactly symmetric division of the pie is highly focal, an only nearly symmetric division is not.

Other potentially important factors leading to the development of focal point equilibria are contextual-learning and shared experiences. Roth and Schoumaker (1983) and Binmore et al. (1993) study these types of factors in a series of bargaining experiments in which paid subjects are "trained" to expect certain agreements by being secretly paired with computer opponents that have been programmed to favor those outcomes. After several rounds of bargaining with computer opponents, the human subjects in these experiments evidently begin to expect the bargaining outcome that their computerized partner is programmed to prefer. Put another way, the norms and social cues that human bargainers bring to the bargaining process from their daily lives (e.g. that the parties should split the pie evenly) are rapidly replaced by new norms and social cues that are learned through repeated interaction in the particular bargaining context of the experiment (e.g. that party *A* should get 70% of the pie and party *B* should only get 30%) (Binmore et al. 1993).

When the (trained) human subjects are then secretly paired with other human subjects, pairs that have been trained to expect the same outcome rapidly agree to the usual division (Roth and Schoumaker 1983). The focal point explanation for this observation is that the participants' shared expectations make the outcome focal, and thus make for easy bargaining agreement (cf. Schelling 1980; Carpenter 2003). In contrast, pairs that have been trained to expect different outcomes frequently fail to reach agreement at all. Here, the focal point theory is that these participants have a difficult time reconciling their inconsistent expectations about what a reasonable outcome of the bargaining process would be—i.e. negotiation is difficult because the participants lack a focal point for agreement in the set of possible outcomes (Roth and Schoumaker 1983).[43]

43 An important qualifier on these results is that not all equilibria remain focal once the computerized trainers are removed from the equation (Binmore et al. 1993). This is consistent with an understanding of the norms and expectations that support focal equilibria as being supplemental to more strategic considerations (see Schelling 1980).

So what is the takeaway message on the focal point equilibrium approach to the study of bargaining processes? There's no concise narrative, but a few observations are noteworthy. First, as an empirical regularity, if social norms or shared experiences tend to highlight certain bargaining outcomes, then these outcomes may represent reasonable points of agreement in a bargaining process. In some cases, the norms and common expectations that make a particular outcome focal may allow for tacit coordination in bargaining situations. For example, if prior experience causes both participants to expect a 50/50 division to be the result of bargaining, then this shared expectation may help the participants to quickly agree on that outcome. In other cases, norms and common expectations may provide a *language* or set of *labels* that participants can use to describe different outcomes during negotiation: e.g. one participant may propose that they agree on a 50/50 division "because that outcome is fair" (see Schelling 1980; Janssen 2006).

Second, thinking critically about focal point equilibria can be helpful in the practice and strategy of bargaining (see, e.g., Janssen 2006). At a very practical level, the language or signaling value of social norms and common experiences might provide an important negotiation tool in certain contexts. For example, it may be difficult for *B* to argue against an offer that *A* can persuasively frame as a "fair" outcome. It is also important to remember that repeated interaction in some bargaining contexts may lead to the development of strongly focal agreements or heuristic rules of negotiation. The existence of such focal agreements may actually obstruct efficient bargaining when one of the participants is a "new" player that has not yet developed these common expectations.

Example 20 (Three-Times Specials)**.** Any student of settlement bargaining will eventually come across an apparent rule of thumb whereby liability insurance adjusters limit their settlement payments to a simple multiple of estimated special damages: e.g. "three-times specials" in personal injury litigation.[44] While the accuracy and even existence of this heuristic are disputed,[45] assume for sake of illustration that such a rule exists. A plaintiff's attorney familiar with the three-times specials norm may have little trouble reaching an agree-

ment to settle: common expectations and contextual norms make settlement at three times specials focal.[46] But what if the plaintiff's attorney doesn't have a background in personal injury disputes and so isn't familiar with this rule of thumb? In this case, the existence of a strong contextual norm may actually hinder the parties from reaching a settlement agreement.

Finally, it is strategically important to remember that what is focal in one context may not be focal in other contexts. This relates to an earlier observation that institutional knowledge (e.g. about what kind of outcome is "fair") may not always generalize across different contexts. Particularly in novel bargaining situations, it may be a valuable exercise to think critically about how different norms and expectations may tend to influence one's own, and the other participants', evaluation of different potential agreement outcomes.

3.3 BEHAVIORAL ECONOMICS

Behavioral economics is the term usually applied to a subset of economic research in which elements of cognitive psychology are added to economic models of choice and behavior.[47] This section makes no attempt to survey even the tip of the iceberg on behavioral economic research, but does provide some broad-stroke commentary on three topics in the behavioral economics literature that are especially relevant to the present study of legal bargaining. These topics are overconfidence, anchoring, and framing effects.

44 See, e.g., Peterson v. Gilmore, 5 Wash. App. 55, 56, 485 P.2d 622, 622-23 (1971); Sanders v. Smith, 83 N.M. 706, 709, 496 P.2d 1102, 1105 (Ct. App. 1972).

45 For example, compare Ross (1980, pp. 108–111) and Kritzer (1998, pp. 817–18).

46 See, e.g., Ross (1980, p. 110): "The key to simple and rapid agreement on the part of attorneys and adjusters is that both sides understand that, in a routine case, a multiple of medical bills that appear to be in proper relation to the claimed injury forms a reasonable basis for evaluating the total claim."

47 For a history and overview of behavioral economics, see Camerer and Loewenstein (2004).

3.3.1 *Overconfidence*

To oversimplify somewhat, I am grouping under the label of *overconfidence* a variety of cognitive biases (overconfidence, overoptimism, self-serving bias, self-reinforcing bias) that are thought to limit human capacity for subjective probability assessment and the estimation of uncertain events (see generally Tversky and Kahneman 1974; Kahneman et al. 1982). The idea of overconfidence is that the human brain is hard wired for confidence in a way that tends to bias our assessments of things that involve us. For example, we systematically underestimate the amount of time it will take to write a research paper, systematically overestimate our core capabilities (everyone thinks they are above average), systematically underestimate the rationality of other people, and systematically overestimate the probability that uncertain future events will turn out in our favor (see, e.g., Roxburgh 2003).

Unchecked overconfidence can be damagingly inefficient in a bargaining context, particularly when participants exhibit excessive confidence in their own assessment of what a "fair" outcome is or when participants perceive the circumstances as tending to favor their bargaining position. A long series of economics experiments demonstrate the potential problem of overconfidence in a settlement bargaining context.[48] The essential structure of each experiment was to assign paid subjects the roles of plaintiff or defendant in a mock settlement bargaining game. Rather than announcing what the outcome of a trial verdict would be, however, the subjects were given summaries of the relevant law and fact patterns and thus had to assess the value of a trial verdict outcome on their own.

Loewenstein et al. (1993) report that when asked to write down (pre-negotiation) what a fair settlement amount would be, subjects in this type of experiment exhibit a pronounced tendency toward overconfidence. Plaintiffs tend to think a fair settlement involves a larger transfer; defendants tend to think a fair settlement demands a smaller transfer. Babcock et al. (1995) find that the presence of overconfidence bias substantially

48 For an overview of this series of related experiments, see Babcock and Loewenstein (1997). For a discussion of overconfidence in non-experimental (i.e. real-world) data, see Farmer et al. (2004).

decreases the capacity of subjects in these experiments to settle their mock disputes.[49]

The important concern when addressing a cognitive failure like overconfidence is in finding ways that any negative effects of the bias can be mitigated (see, e.g., Roxburgh 2003). Fortunately, there is some evidence that overconfidence bias can be controlled by taking active steps to counteract it. Babcock et al. (1995), for example, report that subjects who are uninformed of their role (as plaintiff or defendant) while reading the relevant law and fact pattern are much less likely to exhibit strong overconfidence in their initial assessments of what a fair outcome would be; in subsequent settlement negotiations, these initially uninformed participants are also more likely to reach an efficient settlement. Similarly, Babcock et al. (1997) find that the effects of overconfidence bias can be largely mitigated through an exercise of first informing subjects about the human tendency toward overconfidence and then requesting that subjects think about and actively enumerate some of the weaknesses for their side of the case. It is easy to image ways in which these observations could be transformed into practical strategies for "debiasing" settlement assessments in legal practice.

3.3.2 Anchoring

The cognitive failure often referred to as *anchoring* also implicates the limited human capacity for estimating the value of novel or uncertain events. Humans appear to conduct such estimation by first establishing a baseline, and then making incremental adjustments to that baseline value to reflect differences in circumstances. For example, in trying to determine the "fair" price of a new car, a customer might start by looking at the MSRP and then try to subtract off an amount that seems reasonably likely to represent a pure price markup. Similarly, the seller of a used car will often set an asking price at something like the average price at which similar used cars are being sold, adjusted up or down to reflect the particular mileage, repair history, and trim level of the current used car.

49 But cf. Galasso (2010), who theorizes that overconfidence may promote more rapid settlement in some contexts.

So far, everything sounds just fine. There's nothing wrong with estimating values relative to a certain baseline point, particularly in cases like the used car example where comparison to a market-average price strikes as an entirely reasonable strategy. The problem is in the implementation: humans tend to make adjustments to the baseline value that are systematically smaller than necessary. Resulting estimates are thus *anchored* around the (baseline) starting value (see generally Tversky and Kahneman 1974; Kahneman et al. 1982; Seymour and McClure 2008). Put another way, estimates of uncertain events are systematically biased in the direction of the assessor's initial frame of reference.

A variety of negotiation strategies attempt to exploit anchoring bias by manipulating the other participant's choice of baseline value. For example, a seller might start off negotiations with an artificially high selling price, reasoning that buyers will anchor their counter-offers against that high price and thus will on average pay more than if the initial selling price had been lower (see, e.g., Roxburgh 2003, p. 33). It is easy to see what an analogous strategy would look like in settlement or contract negotiation. I do not personally endorse this strategy, but it is important to recognize that it exists and might prejudice performance of the unwary negotiator. Aside from simply being aware of the problem, the valuation bias associated with a human tendency toward anchoring may be mitigated by actively concentrating on the distinctions (rather than similarities) of the baseline item and the thing to be valued (Chapman and Johnson 1999) and by searching for contextual cues outside of the bargaining process (e.g. in historical data, market data, etc) (e.g. Roxburgh 2003).

3.3.3 Framing Effects

Again to oversimplify the literature, I am grouping under the label of *framing effects* a variety of cognitive biases that affect the perception of gains and losses on a transaction: e.g. the endowment effect (see, e.g., Kahneman et al. 1991; Thaler 1992), loss aversion (see, e.g., Kahneman et al. 1982), status quo bias (see, e.g., Samuelson and Zeckhauser 1988), and mental accounting practices (see, e.g., Thaler 2008). The unifying theme of these different framing effects is that humans often appear to

assess valuations relative to a frame of reference such that losses and gains are conceptually distinct and asymmetrically valued. Put bluntly, the pain we associate with giving something up (e.g. losing $5) appears to be substantially greater than the value we associated with gaining something (e.g. gaining $5).[50]

Framing effects can obstruct efficient bargaining by creating situations in which the perceived cost of a concession exceeds its perceived value. In a sales context, this may prevent bargainers from completing beneficial exchanges (cf. Kahneman et al. 1990). In a settlement bargaining context, the defendant's loss aversion in terms of paying compensatory damages (leaving the defendant with less money than she had in the status quo) may lead to bargaining impasse when the plaintiff (who is gaining money relative to a post-injury frame of reference) does not perceive a proposed settlement to be "as large" as it is perceived by the defendant.

50 For an interesting discussion of framing effects in law, see Cohen (1992).

APPLICATION TO LEGAL BARGAINING

4

The objective of Parts 1-3 of this study was to outline several important features of economic research on bargaining in a way that would be both accurate and accessible to a non-technical legal audience. To the extent that the previous parts have achieved that goal, the purpose of this study is now complete. The conceptual framework developed in the previous material can be immediately deployed in thinking through the practice of legal bargaining as well as the jurisprudential theory of bargaining in law.

One immediate lesson of the previous material is that it can be dangerous to simply "trust your instincts" in the practice of legal negotiation. As noted in discussion of the behavioral economics of bargaining in Section 3.3, cognitive biases such as overconfidence and certain framing effects can tend to push us in the direction of making regrettably strong demands in a bargaining situation. This is particularly problematic when inconsistent demands aggravate the strong inequity aversion that Section 3.1 found to characterize participant preferences in many bargaining contexts. The natural consequences of these influences include wasteful negotiation delay and even complete bargaining impasse.

Another reason to be wary of trusting our instincts is that reasonable expectations about the outcome of a bargaining process may tend to be highly context specific. This was noted in Section 1.1, which cautioned that institutional knowledge often fails to generalize across different bargaining contexts. A similar observation was raised in Section 3.2, which explained the focality of equilibria as a context-specific and evolutionary characteristic of many bargaining games. As noted in Example 20, inattention of a bargaining participant to the existence of focal point equilibria in a particular context can hinder effective negotiation and preclude efficient agreement.

So if you can't trust your instincts when bargaining, where should you turn? Among many sources of instruction, this study suggests that the economic theory of bargaining can provide a helpful guide. The point is not to na239ve dictate how one should behave in legal bargaining

situations. None of the simple bargaining games examined in this paper are likely to reach nearly the complexity of real-life bargaining processes, and as noted in Section 3.1, abstract theoretic solutions tend to be a poor guide for behavior at any rate.

Rather, the point of an economic approach to legal bargaining is to reprogram many of the bad habits and naïve impressions that lay people might otherwise bring to the bargaining table. Recall the question posed in the introduction of this study: "In my own words, how would I define a *bargaining* process?" How much better could you answer this now? If not much better, do you at least now see why the question is so complicated?

In the practice of legal bargaining, it will rarely be the case that you will know exactly what to do. This would require a knowledge of the other party's strategies which is unlikely to be available under interesting circumstances. Attention should thus be turned inward. Even if economic theory may not provide cutting practical insights about what to do in bargaining, it may nevertheless prove highly instructive about what *not* to do.

The remainder of this study concludes by discussing two brief applications of the forgoing analysis to issues in legal bargaining: (1) attention to individual rationality in settlement negotiation and (2) the concept of bargaining power in contract law doctrine. The point of these applications is not to provide an exhaustive analysis of the issues involved, but only to illustrate how portions of the bargaining framework developed in this study can be quickly applied to improve one's understanding of practical bargaining situations.

4.1 REMEMBERING INDIVIDUAL RATIONALITY

The concept of individual rationality (introduced in Section 2.1 of this study) suggests that in making a choice between two alternatives, a bargaining participant should select whichever alternative is most preferred. This "axiom" of bargaining behavior is at the same time almost embarrassingly obvious and fundamentally integral to the economic understanding of bargaining and negotiation. It is also a desirable property of behavior that seems often overlooked by settlement negotiators who are too locked in combat with each other to see the opportunities for efficient settlement as they arise.

Much instruction on settlement negotiation seems to encourage inattention to individual rationality. A textbook treatment of settlement negotiation suggests that an attorney should (1) determine the client's *walkaway value* (i.e. disagreement value), (2) try to guess at the opposing side's walkaway value, (3) decide on a settlement *target value* that is sufficiently favorable to the client's position (i.e. a very high demand for the plaintiff or a very low offer for the defendant), and (4) engage in subsequent negotiations in the posture of a zero-sum bargaining game participant—the objective being to secure a favorable outcome by (a) trying to learn how much the opponent will concede while (b) trying to hide one's own willingness to make concessions (see, e.g., Nelken 2001, ch. 2). Popular suggestions of a similar vein include (1) trying to make the opposing side uncomfortable during negotiations, (2) insisting on arbitrary preconditions to negotiation in order to obtain a psychological advantage, (3) forcing the other side to make the first offer, (4) starting from a very extreme initial offer, (5) delaying settlement when the other side looks anxious to settle, etc (see, e.g., Meltsner and Schrag 1989).

As the generally agnostic tone of this study should indicate, I have no reason to think that any of these strategies are inherently right or wrong in all contexts. They do, however, seem capable of obscuring the important insight that a bargaining process is not just a zero-sum game. Bargaining is a process in which participants have *both* common and competing interests in reaching agreement. Too much emphasis on competing to get the most favorable settlement (i.e. on the competing interests part) runs the risk of violating individual rationality by failing to account for the potential benefits of a more moderate settlement agreement (i.e. the common interests part). To illustrate the concern, consider the following continuation of the settlement valuation puzzle given in Example 2 of Section 1.2.

Example 21 (Continuation of the Reasonable Settlement Puzzle)**.** After preliminary investigation and research into the incident described in Example 2, you meet with opposing counsel who offers to settle the case for $15,000 paid out immediately. You are confident that by holding fast and continuing with the litigation process, you could eventually drive the other side to as high a settlement

as $28,000. Based on your prior experience, you suspect that the process could take as long as 2 more years to get to the more favorable settlement agreement. Which of these two alternatives is in the greater interest of your client?

My impression is that the standard zero-sum approach to settlement bargaining would tend to lead practitioners to go for the $28,000 settlement. This isn't obviously wrong—it's almost twice the value of the current settlement proposal! But focusing exclusively on the gross settlement amounts in question may misses the beneficial properties that early settlement has to offer (i.e. the common interests of participants in settling the dispute).

Suppose legal representation will run your client around $5,000 per year while the claim is being litigated, and suppose that the lower offer of $15,000 could be immediately invested in a savings instrument that pays annual interest at a rate of 10%. With an online calculator or spreadsheet, it is easy to compute that by the time the later (higher) settlement could be reached, the early (lower) settlement would be worth $18,150 due to interest accumulation. By contrast, the later (higher) settlement would give the client a net payout of only $17,500 after subtracting off accumulated negotiation costs and accounting for lost interest.

The point of this example is not that parties should always settle as soon as possible. The point is simply that trivial arithmetic exercises like the one above might help to put the value of different alternatives in perspective, so that settlement decisions are guided by underlying preferences and sound decision principles and not by mistakes of reasoning brought about by failing to see the bargaining process in all its fullness.

4.2 BARGAINING POWER & FAIRNESS IN CONTRACTS

At whirlwind speed, first-year law students are introduced to, and then rushed past, the related contract law doctrines of unfairness, unconscionability, and contractual terms of adhesion. The textbook cases in this section of a contracts course are usually *Henningsen v. Bloomfield*

Motors, Inc.[51] and *Williams v. Walker-Thomas Furniture Co.*[52] There's no need to repeat the specific details of each case at this time: suffice it to say that both cases deal with layperson customers who sign commercial contracts in the act of making a purchase, and who subsequently seek release from particularly harsh terms in the fine-print boilerplate language of their respective contracts.

More or less consistent with the modern Uniform Commercial Code's treatment of unconscionable contract terms,[53] both cases fall in favor of the plaintiff. In *Henningsen v. Bloomfield* (p. 390), the court explains its willingness to release the plaintiff from the contract term, at least in part, on grounds that this term in the form contract amounted to a take-it-or-leave-it offer; the court reasons that the plaintiff had no choice but to accept the offending term if he wanted to buy an automobile. The court in *Williams v. Walker-Thomas* takes an even more explicit stance on the issue of relative bargaining power in deciding whether the plaintiff should be held to the challenged term:

> Whether a meaningful choice is present in a particular case can only be determined by consideration of all the circumstances surrounding the transaction. In many cases the meaningfulness of the choice is negated by a gross inequality of bargaining power… Ordinarily, one who signs an agreement without full knowledge of its terms might be held to assume the risk that he has entered a one-sided bargain. But when a party of little bargaining power, and hence little real choice, signs a commercially unreasonable contract with little or no knowledge of its terms, it is hardly likely that his consent, or even an objective manifestation of his consent, was ever given to all the terms. (p. 449)

These cases and their progeny raise a plethora of difficult legal issues that are the focus of a substantial academic literature in their own right.[54] For present purposes, however, *Henningsen v. Bloomfield* and *Williams*

51 32 N.J. 358, 390, 161 A.2d 69, 87 (1960).

52 350 F.2d 445, 449 (D.C. Cir. 1965).

53 UCC §2-302 ("Unconscionable Contract or Clause").

54 See, e.g., Epstein (1975), Eisenberg (1982), Rakoff (1983).

v. Walker-Thomas are cited only as a means of exploring how economic research relates to bargaining power and fairness in the legal doctrine. There isn't any clear narrative on this topic, but a few observations are noteworthy.

To begin, one might wonder how well the legal concept of bargaining power comports with the economic concept of bargaining power that Part 2 of this study attempted to flesh out. Thinking back to the asymmetric version of Nash's axiomatic bargaining model, the structural bargaining model of the ultimatum game, and the related model of "bargaining" under the dictator game, it seems clear that a party with effectively zero relative bargaining power (in the economic sense of the term) is far from helpless in a bargaining context. As a point of bargaining theory, such a participant cannot be expected to get any of the pie, but neither will such a participant be made worse-off than under the status quo disagreement outcome. In fact, empirical evidence suggest that even this theoretic reasoning might be too harsh, since participants with zero bargaining power in the ultimatum game routinely leave experimental economics laboratories with substantial portions of pie.

The evils of asymmetric economic bargaining power just don't seem that bad: the disadvantaged participants may not be getting a great deal, but neither are they made worse off than they would be without engaging in the transaction. A better way to understand judicial concern with bargaining power might then be to see it as a conflation of bargaining power on one hand, and confusion or misleading practices on the other hand, which combine to lead the disadvantaged participant to actually accept a bargaining outcome that is objectively worse than their disagreement outcome: i.e. the concern is with violations of the axiom of individual rationality. There is language in both of the above cases to suggest that this type of intentional confusion of the plaintiff was among the courts' concerns.

Alternatively, one might interpret judicial concern for bargaining power as more accurately a concern about the fairness of a bargaining outcome from a societal perspective. Some of the discussion in Sections 3.1 and 3.2 of this study speaks to the concept of fairness and its apparent determinants in a bargaining context. For example, while a 50/50 division of a gifted pie might be the only fair outcome in that context, the concept

of fairness can change to reflect evolving norms and focal outcomes, can change to reflect whether individual participants have to work to earn their right to divide a pie, and can change to reflect contextual differences in how a bargaining process is conceptually framed. Recognizing these nuances in fairness may be helpful not only in understanding judicial concerns, but also in framing arguments about the (un)reasonableness of different bargaining agreements.

As noted previously, this brief discussion of legal topics is not meant to provide exhaustive analysis or hard-and-fast rules to follow. The former is beyond the scope of the present study, and the later is simply infeasible given the importance of context-specific factors in bargaining processes. The point of this discussion is to illustrate ways in which the economic concept of bargaining can be employed to better understand the theory and practice of legal bargaining. It is my hope that it has done so.

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