# THE ROLE OF RECIPROCITY IN INTERNATIONAL LAW

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## INTRODUCTION

> [A] man be willing, when others are too, as far forth for peace and defense of himself, . .. , be contented with so much liberty against other men as he would allow other men against himself.[1]

The concept of reciprocity assumes peculiar importance in a world where there is no external authority to enforce agreements, that is, in a world that exists in Hobbesian state of nature. Historically, norms of reciprocity have been vital is escaping lives that would otherwise be "solitary, poor, nasty, brutish and short."[2] Reciprocity generally involves returning like behavior with like. In Robert Axelrod's terminology, reciprocity is a tit-for-tat strategy.[3] Such a strategy permits cooperation in a state of nature, when no authority for enforcement of agreements exists.

International law, in this sense, exists in a state of nature - there is no overarching legal authority with compulsory jurisdiction to enforce agreements. Inevitably, reciprocity has become an important element in the practice of sovereign nations and in the body of existing international law. This paper begins with setting up a taxonomy of social interactions in a game-theoretic framework,[4]

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[1] The second law of nature, according to Hobbes. THOMAS HOBBES, LEVIATHAN, (1651) (Liberal Arts Press 1958) at 110.

[2]*See* Hobbes *supra* note 1 at 107.

[3]*See generally* ROBERT AXELROD, THE EVOLUTION OF COOPERATION (1984). Axelrod demonstrates the superiority of a cooperative strategy when people undertake repeated interactions over a strategy that would seemingly be rational in a Prisoner's Dilemma situation, discussed infra Part I.C.

[4]An earlier, somewhat different, version of this taxonomy is found in Francesco Parisi, *The Cost of the Game: A Taxonomy of Social Interactions*, 9 Eur. J. L. Econ. 99 (2000) (hereinafter Parisi, Taxonomy).

to examine the role of reciprocity in the functioning of international law and whether reciprocity is, in effect, a meta-rule for the law of nations.

Part I defines the characteristics of specific types of interactions between countries in a game-theoretic framework. Part II sets out definitions for different forms of reciprocity found in international law. We then examine the international law settings where reciprocity constraints would yield an optimal outcome, and when such constraints would be ineffective. Part III sets out specific examples from international law, and see where they fit in the taxonomy of the games formulated. This makes clear that the principle of reciprocity is of vital importance in achieving efficient outcomes in many circumstances. Finally, in Part IV, we conclude that despite the occasional failure, reciprocity is important enough to be considered a meta-rule of the system of international law - an essential element in its functioning.

## I. RECIPROCITY THROUGH THE LENS OF GAME THEORY: A TAXONOMY

Game theory is a useful tool for the study of international law and the relations between sovereign states, since it focuses on interactions where parties can determine only their own strategies and thus have no direct control of the outcome.[5] The outcome results from the joint interaction of the strategies chosen by independent players. That is, parties can choose their strategies but cannot directly determine the outcome by their own actions. For the purpose of our analysis, we distinguish five broad categories of relevant interactions, which provide a useful taxonomy for the

[5]The general world of game theory is one where a player can control only their own strategies, but not the final outcome. *See, e.g.*, THOMAS SCHELLING, THE STRATEGY OF CONFLICT (1980 ed) (discussing issues of war and strategy). For a very brief and basic introduction to game theory, *see* ROBERT COOTER AND THOMAS ULEN, LAW AND ECONOMICS (3rd ed. 2000) at 34-39.

understanding of international relations.[6] In each case, the payoff for Player A is represented by the first number in a cell; the payoff for Player B is represented by the second figure. Each player has three possible payoffs. Generally, the greater the level of cooperation, the greater the combined pay-off. Strategy I represents full cooperation; strategy II represents partial cooperation; and strategy III represents a situation where neither party chooses to cooperate.

Imposing a reciprocity constraint means that the choice of strategy is determined mutually. Thus, if Player A chooses to cooperate, under a reciprocity constraint, Player B will have to cooperate, If Player A chooses Strategy III, and not cooperate, Player B will also choose Strategy III. Both parties know that the imposition of a reciprocity constraint limits interaction, so that options on the diagonal, as shown in Figure 2, are left available.

A. *Pure Common-Interest Situations*

In game theory, this group of situations are represented as positive sum games with a single dominant strategy that leads to efficient outcomes. This optimal outcome is achievable by the parties in a stable Nash equilibrium.[7] This category has been categorized by Thomas Schelling as a pure common interest game.[8] As the optimal outcome is a Nash equilibrium, where the party's incentives are perfectly aligned, any implicit or explicit agreement between the parties becomes self-enforcing, in the sense that no party has an interest to deviate unilaterally. A sample pay-off matrix in such a game could take the following form:

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[6]This draws heavily on Parisi, Taxonomy, *supra* note 4.

[7]A Nash equilibrium is a situation where no individual player can do better by changing strategy, as long as the other party does not change strategy. Thus, neither party has any incentive to change the choice made. *See* Cooter and Ulen, *supra* note 5 at 37.

[8]*See* Schelling *supra* note 5 at 88.

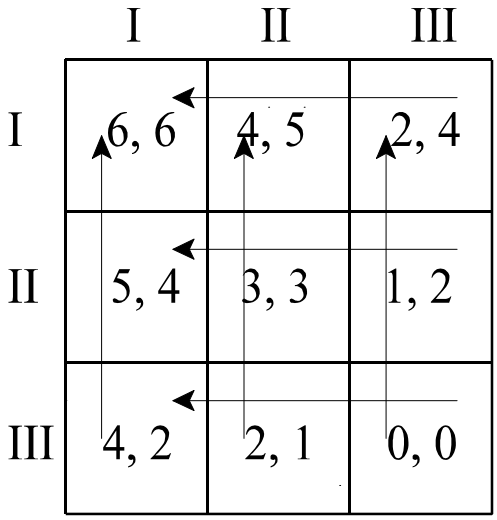


**Figure (1)**: *A Pure Common Interest Game*

Both parties, following individually rational strategies which maximize payoffs would choose to follow Strategy I, for a payoff of 6 units each. The outcome remains unchanged if a reciprocity constraint is imposed:

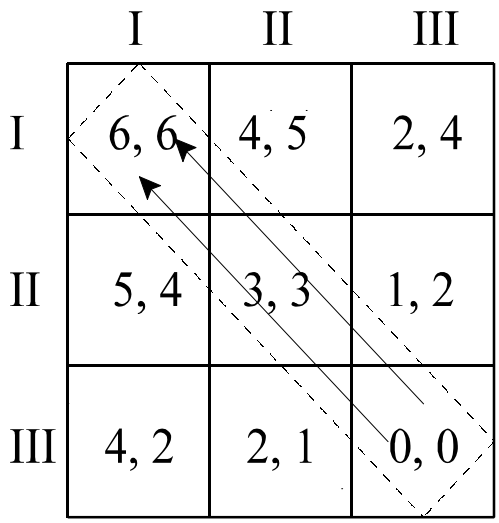


**Figure (2)**: *A Pure Common Interest Game with Reciprocity*

The cooperation outcome, with a payoff of 6 units for each player, remains the dominant strategy even with the imposition of a reciprocity constraint, and there is no incentive for either party to deviate from this outcome.

This amounts to the notion termed, in the economics literature, "perfect incentive alignment."[9] This game's payoff structure excludes the possibility of opportunistic behavior. One could think of this ideal environment as the result of optimal contract enforcement mechanisms, institutional safeguards, relationships involving trust and reputation, or any other device which renders adversarial possibilities non advantageous or inaccessible to the players.[10]

Generally speaking, solutions to this class of games are not troublesome, since all players gain by cooperating. Perfect incentive alignment guarantees that the spontaneous equilibrium of the

[9]See Parisi, Taxomony, *supra* note 4 and Schelling, *supra* note 5.

[10]*See generally*, Cooter and Ulen, *supra* note 5 for a discussion of the interaction of game theory and the law. They use game theory as an analytical toot to discuss contract law. *Id*. at 184-198.

game will occur at an optimizing point.[11] Whether the incentive-alignment is endogenous or exogenously determined by existing laws or norms, there is no need for additional intervention in either situation.

Real life situations of common interest games are common, but hard to illustrate with international law examples, because, unlike other strategic situations, common interest situations are self-enforcing and rarely emerge to engage the attention of international actors and policymakers as relevant international legal issues. As long as interests of all parties converge, no dispute will arise that needs resolution by resort to a treaty or other legal instruments. Nonetheless, situations do develop that ultimately reflect features of a common interest game. An example of this is the custom in international law regarding the Continental Shelf that developed following the Truman Proclamation of 1945.[12] This is discussed in greater detail below; however the punch line is that it was in the interest of all coastal states to cooperate with the United States on the matter, even though the Proclamation was inconsistent with existing international law.

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[11] Similarly, pure coordination problems are characterized by the perfect convergence of the players' interests and by the additional feature of multiple equilibria. The convergence of individual and collective interests fosters an optimal outcome on the basis of a mere coordination of self-interested strategies. It has been argued, however, that the solution to coordination problems may be delayed if it relies exclusively on decentralized processes of legal and social order. The multiplicity of Nash equilibria in a coordination game creates difficulties for decentralized solutions. For example, if everyone in a country needs to coordinate on a basic set of traffic conventions, such as driving on the same side of the road, the emergence of spontaneous ) but heterogeneous ) clusters of traffic customs would consolidate local equilibria that do not possess the features of universality required in a modern society. Ironically, however, the most universal traffic rules are those for water navigation, which emerged through spontaneous rule-making processes. For an interesting historical background, see JOHN H. WIGMORE, THE MARITIME LEGAL SYSTEM, (1928); *see generally*, NICHOLAS J. HEALY & DAVID J. SHARPE, ADMIRALTY CASES AND MATERIALS, (2nd ed., 1986); IAN BROWNLIE, PRINCIPLES OF PUBLIC INTERNATIONAL LAW (4th ed., 1990); THOMAS J. SCHOENBAUM, ADMIRALTY AND MARITIME LAW, (1987). The issue of reciprocity in the Law of the Sea is discussed further *infra* Part III.C.

[12] *See* discussion *infra* Part III.A. The discussion is based largely on Brownlie, *supra* note 11, and MICHAEL BYERS, CUSTOM, POWER AND THE POWER OF RULES (1999). The incentive alignment is among the *coastal* states; in effect, non-coastal states are treated as non-participants.

*B. Divergent Preference Games*

This class of games encompasses positive sum games with multiple Nash equilibria, where the different equilibria are the result of differences in preferences, and not strategic behavior. These games are characterized by mixed conflict-coordination motives. In the literature, these games are often called Battle of the Sexes games.[13] Coordination problems in such games could be solved by permitting sequential decision-making or pre-commitment strategies. In situations where the players engage in games repeatedly, a norm of fairness may be sufficient to address the problem of a sub-optimal conflictual outcome, if the discount rates of the parties are sufficiently small. For a one-time game, a pay-off matrix for a Divergent Preference game could look like this:

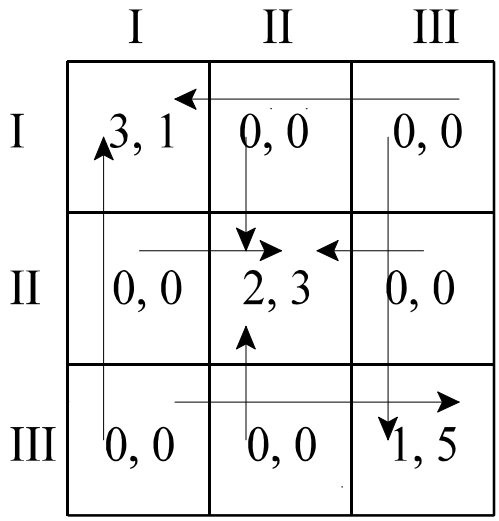


**Figure (3)**: *Divergent Preference Game*

In this case, there are three Nash equilibria, along the diagonal, with no single dominant outcome.

[13]See Parisi, Taxonomy, supra note 4.

Nor do matters improve with a reciprocity constraint, if the game is played a single time. The pay-off matrix for a Divergent Preference game with a reciprocity constraint would take the following form:

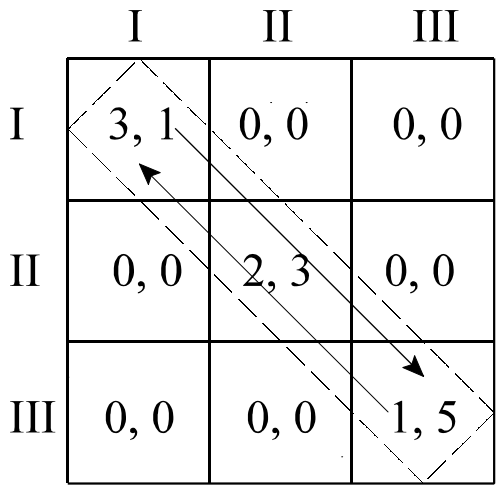


**Figure (4)**: *Divergent Preference Game under Reciprocity*

The [III,III] cell would yield the highest total payoff, and is the most desirable in terms of maximizing total welfare. But player A prefers Strategy I and Player III prefers strategy III. Imposing a reciprocity constraint does not change this preference ordering. It might still be possible to achieve

the outcome with the highest total outcome. If players are in the game repeatedly, or if there is a possibility of role reversibility, the players may choose to cooperate to maximize total payoffs over all periods.[14]

*C. Prisoners' Dilemma Situations*

This is probably the best known and most widely used set of games. A prisoners dilemma game is game with a surplus obtainable through the parties' cooperation, but has dominant defection strategies which yield a sub-optimal outcome for both players, when both players follow a strategy that is privately rational. In such games, defection strategies are dominant, and the possibility of opportunistic behavior renders the Pareto optimal outcome unachievable in equilibrium. A pay-off matrix for a Prisoner's Dilemma game could have the following form:

[14]Role reversibility, where any person could be on either side of a dispute, can lead to stable norms that yield efficient outcomes over time. This is accomplished by stochastic reciprocity, see discussion infra Part II. The medieval law merchant provides one example. *see* Francesco Parisi, *Customary Law* in THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW (hereinafter, Parisi, Customary Law). *See also*, ROBERT C. ELLICKSON, ORDER WITHOUT LAW: HOW NEIGHBORS SETTLE DISPUTES (1991). Ellickson discusses the mechanisms of informal dispute settlement that have evolved among ranchers in Shasta County, California. In international law, role reversibility is at the heart of the reciprocity that is integral to the Law of the Sea as it has developed over time, as discussed *infra* Part III.C.

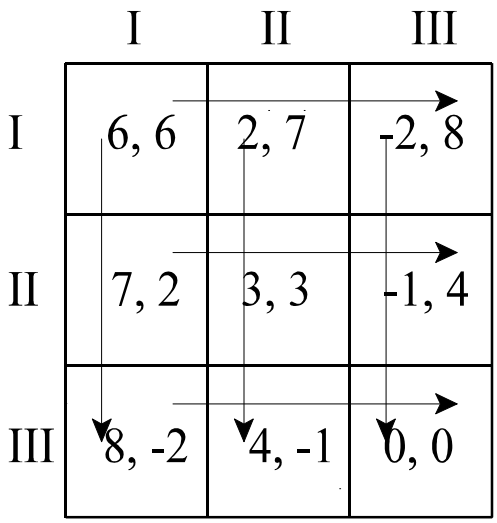


**Figure (5)**: *A Prisoner's Dilemma Problem*

Figure 5 depicts the equilibrium obtained in the absence of a reciprocity constraint. Two players are faced with a cooperation problem. Strategies I, II, and III represent three successively lower levels of cooperation. Even though mutual cooperation at level I generates the highest aggregate payoff, strategy III, no cooperation, dominates in equilibrium, as it is shown by the Nash arrows for the two players.

In this case the cell (6,6), which represents the mutual cooperation outcome, is the Pareto-optimal outcome,[15] but the cell (0,0), which represents the mutual defection outcome is the dominant strategy.

Parisi has pointed out that reciprocity constraints are extraordinarily well-suited for Prisoners' Dilemma situations.[16] International law is rich in telling illustrations of the power of reciprocity constraints in correcting or preventing Prisoner's Dilemma situations. For example, a reciprocity constraint, such as that established in Article 21(b) of the Vienna Convention of 1969[17], eliminates the possibility of opportunistic behavior, and makes the Pareto-optimal cooperation outcome feasible.

*D. Inessential Games*

There are two kinds of games in this category: (i) zero-sum games and (ii) positive sum games where all obtainable Nash equilibria have a constant aggregate payoff All these games are characterized by constant pay-offs, and no single outcome is mutually preferred by the two players. Territorial disputes are an example of this set of games. As it will be discussed more extensively below, it is impossible to design a reciprocity constraint that could have any effect on the strategic behavior of the parties. Consider, for example, the territorial dispute between India and Pakistan over

[15]A Pareto optimum is achieved when it is no longer possible to make anyone better off without making at least one person worse off. *See generally*, E.B.MISHAN, AN INTRODUCTION TO NORMATIVE ECONOMICS.

[16]*See* Parisi, Taxonomy, *supra* note 4.

[17]Vienna Convention on The Law of Treaties, opened for signature May 23,1969, Art. 21, 1155 U.N.T.S. 331 (hereinafter Vienna Convention).

Kashmir. This is the quintessential zero-sum game - the territory can go to only one country.[18] The gain to one country is exactly equal to the loss to the other, since the territory is available in a fixed amount.[19] There is no way the winner can compensate the loser; there is no potential gain from mutual cooperation and, consequently, here is no role for reciprocity constraints in such a situation.

*E. Unilateral Games*

A fifth category of situations, which we term unilateral games, is characterized by the fact that each player has a dominant strategy that will be undertaken, independently from what the other player does, and these dominant strategies are different for the two players. In such games, the pay-off matrix may take the following form:[20]

[18]For now, we are ignoring the possibility of Kashmir as an independent country, so that neither India nor Pakistan claim it. Of course, it is possible to convert this into a non-zero sum game, by including the costs incurred by each state in maintaining the conflict into the pay-off matrix. In this particular case, these costs are not insignificant. India and Pakistan have fought two full scale wars, in 1948 and 1965 over the issue; have had a major military encounter in 1999; and have had ongoing skirmishes for over fifty years. In addition, India claims that Pakistan is funding the ongoing insurgency, which India has had to fight. And these are only the *direct* military costs of the conflict. For an account of the 1948 and 1965 wars from the Indian perspective see JASWANT SINGH, DEFENDING INDIA (1999) at 142, 155-160,172-180. For an Indian journalist's account of the 1999 military encounter, *see* SRINJOY CHOWDHURY, DESPATCHES FROM KARGIL (2000).

[19] Indeed, all situations of conflict over a fixed resource are zero-sum games.

[20]This pay-off matrix is inspired by Robert O. Keohane, *Reciprocity in International Relations*, 40 INT'L ORG'N, 1(1986).

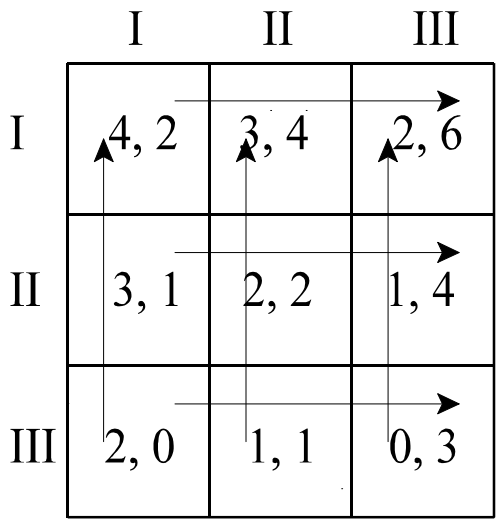


**Figure (6)**: *Unilateral Game Payoff*

In this case, Player A will always prefer Strategy I, regardless of Player B's strategy The interesting feature of such games is that a reciprocity constraint is actually undesirable from the perspective for maximizing the total payoff. With a reciprocity constraint, the possible payoffs are confined to the diagonal. But the outcome that maximizes social gain by maximizing total payoff is when Player A follows Strategy I and Player B uses Strategy III. With a reciprocity constraint, the best the players can do is use Strategy I, with a total payoff of 6. Without a reciprocity constraint,

the players could move to cell [I, III], with a total payoff of 8. In this case, social welfare is maximized by *not* imposing a reciprocity constraint. This is not a trivial or theoretical example; such behavior is often found in realm of international trade liberalization, as shown by Robert Keohane.[21] But reciprocity constraints can be useful in multilateral trade negotiations, as many of the parties are not small countries.[22]

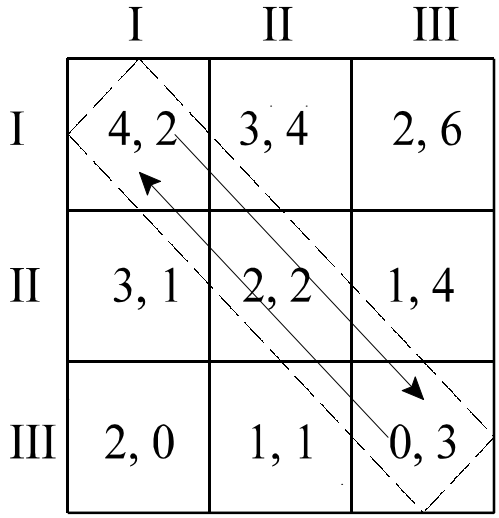


**Figure (7)**: *Unilateral Game Payoff with Reciprocity*

[21]*See* Keohane *supra* note 20. Unilateral trade liberalization can benefit a "small" country, by reducing costs to its consumers and producers, and therefore permitting a more efficient allocation of resources. A "small" country is one that cannot influence world prices for any good or service by adjusting its own demand or supply. *See generally* PAUL R. KRUGMAN and MAURICE OBSTFELD, INTERNATIONAL ECONOMICS, THEORY AND POLICY, (5th ed. 2000). Thus, a small country could benefit by reducing its own barriers of trade rather than engaging in import compression. *See* Nita Ghei and Lant Pritchett, *The Three Pessimisms: Real Exchange Rates and Trade Flows in Developing Countries* in LAWRENCE E. HINKLE AND PETER J. MONTIEL (EDS.) EXCHANGE RATE MISALIGNMENT: CONCEPTS AND MEASUREMENT FOR DEVELOPING COUNTRIES (1999).

[22]*See* discussion *infra* Part III.B.

*F. A Caveat: Absolute versus Relative Payoffs*

Many caveats need to be kept in mind when actually determining what kind of game is at issue. In all the cases above, the pay-off matrices presented only absolute payoffs, with the assumption that the players were using these absolute payoffs in determining their strategy. In the world of international law, this might not be valid assumption. Players, might, for example, be using relative pay-offs in determining strategies. Consider the pay-off in Table 1, a pure common interest game, which would lead to a stable Nash equilibrium which was Pareto optimal, if the players were using the absolute pay-off matrix.[23] A reciprocity constraint was superfluous. However, if the players were concerned with relative pay-offs, the game would be transformed into a negative sum prisoner's dilemma.[24] The pay-off matrix would take the following form:

[23] *See* Table 1 *supra* Part 1.A and accompanying discussion.

[24] One can think of this as an armament game, where the cost of each weapon to a player is 1, and the benefit (or cost) of having one more weapon than the other is +2/-2.

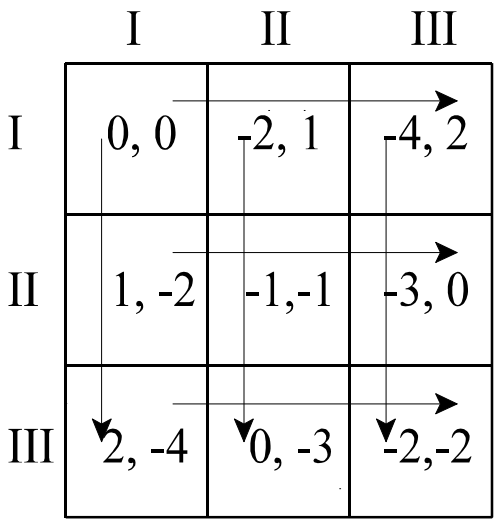


**Figure (8)**: *Relative Payoff Game*

Now, imposing a reciprocity constraint would result in an improvement in welfare by forcing both players to play strategy I, with payoff (0, 0).[25] This is the outcome the players would have reached, without needing a reciprocity constraint, if they were considering absolute payoffs alone.

[25]Thus, there is a credible commitment that ends the armament race.

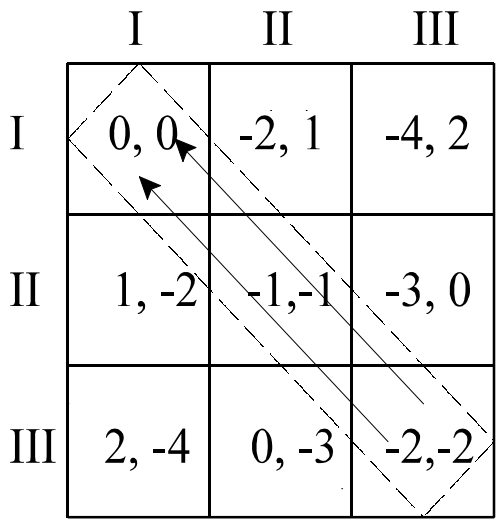


**Figure (9)**: *Relative Payoff Game with Reciprocity*

Treaties that limit armament growth or experimentation, such as the Comprehensive Test Ban Treaty (CTBT), are likely to result in situations where at least some states look to relative payoffs when determining their strategy. However, as is discussed below, treaties such as the CTBT are subject to strategies based on a complex vector of considerations. It is plausible that some countries might use a relative pay-off, while others use the absolute payoff in determining strategy. Further, in such complex treaties, one can never discount the possibility of genuine differences in

presumptions, and therefore preferences, among states. Then, it is difficult to characterize the game as a Prisoners' Dilemma with imperfect monitoring or varying pay-off matrices, as a Divergent Preference game, or as a Unilateral game, since it could have elements of any or all.[26]

Before turning the actual examples from international law, ranging from the Vienna Convention of 1969, to the CTBT which has yet to come into force, we first need to define the term "reciprocity."

## II. DEFINING RECIPROCITY

Reciprocity has many definitions in the literature on international law, including choice of law clauses in private international law.[27] In this paper, we follow Parisi's definitions, [28] and relate to them Robert Keohane's definitions of reciprocity,[29] as the former set is quite precise and developed in a game-theoretic framework, while Keohane's definitions are quite widely used in the literature.

### *A. Structural Reciprocity*

This is the ideal world, where the parties incentives are aligned perfectly, such that neither

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[26]For a detailed discussion on formal models on technological arms races, and the Richardson arms race model, *see* MICHAEL NICHOLSON, FORMAL THEORIES IN INTERNATIONAL RELATIONS (1989). Nicholson also develops formal models for a number of issues in international relations, and provides them in detail that is beyond the scope of this paper. For the original exposition of the Richardson arms race model, *see* LEWIS F. RICHARDSON, ARMS AND INSECURITY (1960).

[27]International private law is outside the scope of this Article, and is not addressed here. For discussions on choice of law clauses in private international law, *see e.g.*, Jay Lawrence Westbrook, *Theory and Pragmatism in Global Insolvencies: Choice of Law and Choice of Forum*, 65 AM. BANKR. L.J. 457 (1991);Volker Behr, *Symposium on U.S.-E.C. Legal Relations: Enforcement of United States Money Judgments in Germany*, 13 J. L. & COM. 211 (1994).

[28]*See* Parisi, Taxonomy, *supra* note 4.

[29]*See* Keohane *supra* note 20.

has an incentive to defect unilaterally. Such reciprocity exists in a world where the players are in a pure common interest game.[30] In such cases, there is no need for external enforcement mechanisms, such as a legal system, or a threat of coercion.

When such perfect alignment of interests does not exist, which is more often than not, there is an incentive for opportunistic behavior. If, as is the case in international law, the means for contract enforcement are inadequate or lacking, alternate safeguards emerge in the system. Through history, norms of reciprocity emerged as meta-rules for the system in the absence of a recognized rule of law.[31]

Evolutionary psychologists have hypothesized that there is a behavioral foundations of reciprocity, and that humans have evolved mental algorithms for identifying and punishing defectors.[32] There is a considerable body of literature on experimental economics in the area, as the issue of reciprocal behavior between individuals has become a matter of increasing interest in experimental economics. As Ernst Fehr and K.M. Schmidt point out, contrary to the predictions based on assumptions of self-interested utility maximization, a significant body of literature has accumulated evidence that suggests that individuals are motivated by concerns of fairness and reciprocity.[33]

For example, Robert Axelrod, found that a tit-for-tat strategy outperformed a 'rational' self-

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[30]See Schelling, supra note 5, and discussion supra Part I.A .

[31]*See* Parisi, Customary Law, *supra* note 14. The classic on the evolution of norms, outside a formal legal system remains Ellickson, *supra* note 14.

[32]*See, e.g.*, Elisabeth Hoffman, Kevin McCabe and Vernon Smith, *Behavioral Foundations of Reciprocity: Experimental Economics and Evolutionary Psychology*, 36 ECON. INQUIRY 335 (1998).

[33]Ernst Fehr and K.M. Schmidt, *Theories of Fairness and Reciprocity - Evidence and Economic Application*, CESifo Working Paper Series No. 403 (December, 2000). However, they also note that the standard economics assumptions still work in the vast majority of cases in making predictions about behavior. Nonetheless, the empirical evidence on reciprocity and trust is robust enough that it cannot be dismissed as an aberration, and must be taken into account while modeling certain kinds of behavior, such as repeat games.

interested strategy in an iterated game; he suggests that cooperation is far more common and 'normal' than expected, and the standard economic model of self-interest is not necessarily the best model for all circumstances.[34] Joyce Berg and her co-authors found that reciprocity was an essential element of human behavior, and held that this accounted for trust extended to an anonymous counterpart.[35] While much of this evidence is for repeat games, Kevin McCabe and his co-authors find support for cooperation under full information even in single play experiments.[36]

Not surprisingly, reciprocity and fairness tend to be meta-rules in customary law; evidence can be found in ancient customs of retaliations.[37] Even though practices of literal retaliation are no longer endorsed as desirable international customs, the principle of reciprocity remains critical in international law, due to the dominant role played by customary law among the sources of international law.[38]

*B. Induced Reciprocity*

This is the golden rule,[39] which successfully binds each player's strategy to that of his opponent. Automatic reciprocity of this type creates a symmetric constraint in the players' strategies. Thus, when a player chooses to cooperate, he knows the other player will also cooperate. Induced

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[34]See Axelrod, supra note 3.

[35]Joyce Berg, J. Dickhaut and Kevin A. McCabe, *Trust, Reciprocity and Social History*, 10 GAMES & ECON. BEHAV. 122 (1995).

[36]Kevin A. McCabe, Steven J. Rassenti and Vernon L. Smith, *Game Theory and Reciprocity in Some Extensive Form Experimental Games*, 93 ECON. SCI. 421 (1996)

[37]Francesco Parisi, *The Genesis of Liability in Ancient Law*, 3 AM. L. & ECON. REV. 82 (2001) (hereinafter Parisi, Genesis of Liability).

[38] *See, e.g.* Article 38(1) of the Statute of the International Court of Justice (stating that customary law is a source of international law).

[39]*See* Parisi, Taxonomy, *supra* note 4.

reciprocity means that there is no incentive left to defect unilaterally, or to choose defection as a defensive strategy.[40] A reciprocity constraint of this sort eliminates the off-diagonal choices on the pay-off matrix.

This equilibrium should be contrasted with the outcome induced by a reciprocity constraint as illustrated in Figure 3, reproduced below.

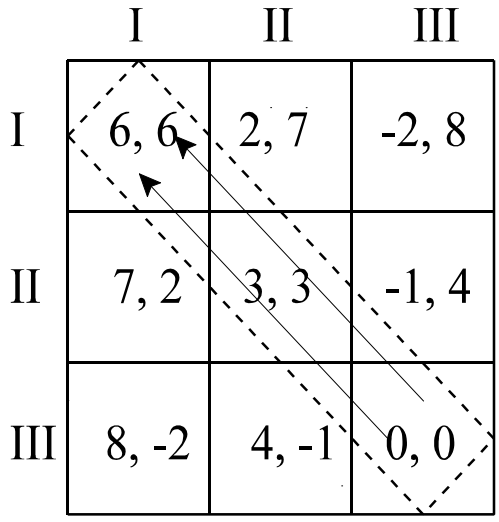


**Figure (10)**: *A Prisoners' Dilemma Problem with a Reciprocity Constraint*

[40]Defection in this context means choosing Strategy III, and not cooperating.

Figure 3 shows the effect of a reciprocity constraint on the equilibrium obtained in Figure 2 under the Prisoner's Dilemma.[41] By eliminating the accessibility of asymmetric outcomes, golden-type reciprocity compels the parties to take into account the effect of the opponent's reciprocal choice, when selecting their optimal strategy. In this way, the dominance of strategy III obtained in Figure 2 is transformed in a dominance of strategy I, with optimal levels of cooperation for the two players. Now, the only options left as choices for the players are the mutual cooperation, strategies I or II, or no cooperation, Strategy III. The players will now choose the mutual full cooperation outcome as the dominant strategy; the Nash equilibrium is also the Pareto-optimal outcome.

This is akin to, though not identical with what Keohane terms specific reciprocity, in that it has an equivalence element.[42] In Keohane's terminology, specific reciprocity is bargained for, and has fairly precise terms for an exchange that is approximately equivalent. Though he does not explicitly make this assumption, specific reciprocity would seem to be more applicable in bilateral situations.[43] A golden- type, induced reciprocity rule is easily applied in a multilateral situation, and it has to do with strategy, not with the content of negotiation.[44]

A rule of reciprocity that is very close to Keohane's specific reciprocity and identical with Parisi's induced reciprocity is recognized as a rule governing all treaty law within the system of public international law. The Vienna Convention of 1969 explicitly incorporates such an induced reciprocity constraint in Article 21 (1) (b):

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[41] *See* discussion *supra* Part I.C.

[42] *See* Koehane, *supra* note 20.

[43] Alan Swan reads specific reciprocity in this bilateral sense. *See* Alan C. Swan, *Symposium: Prevention and Settlement of Economic Disputes Between Japan and the United States: Part I: General Legal and Institutional Framework: "Fairness" and "Reciprocity" in International Trade: Section 301 and the Rule of Law*, 16 ARIZ. J. INT'L & COMP. L. 37 (1999).

[44] Obviously, sometimes the distinction between negotiating strategy and content may not be clear cut.

> "Legal Effects of Reservations and of Objections to Reservations
> A reservation established with regard to another party . . . modifies those provisions to the same extent for that party in its relations with the reserving state."[45]

This provision of the Vienna Convention effectively removes all incentive for unilateral defection and substantially reduces the probability of hold-outs during treaty negotiations as a strategy.[46]

An induced reciprocity rule is sufficient to get the players out of a prisoners dilemma. However, induced reciprocity constraints are effective only when there is an incentive for unilateral defection by the parties.[47] Such a rule is not a solution when the conflict occurs along the diagonal possibilities of the game, as in a Divergent Preference game, as it will not alter the dynamics of the game. A different form of reciprocity constraint is needed for interactions that take a form other than the Prisoner's Dilemma.

*C. Stochastic Reciprocity*

Stochastic reciprocity can be a successful arrangement between two or more players in a Divergent Preference game. The players must undertake repeated transactions in a stochastic game. The source of randomness in the game could be role reversibility of the players, or a random distribution of asymmetric payoffs to the players over the repeated plays of the game.[48] Stochastic

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[45]*See* Vienna Convention, *supra* note 17.

[46] The GATT, and now the WTO, has a similar reciprocity constraint through the use of the 'most-favored-nation' clause. *See* discussion *infra* Part III.C.

[47]Ernst Fehr and Simon Gächter use different terminology. They term reciprocal tendencies towards cooperation "positive reciprocity" while the retaliatory aspects are called "negative reciprocity." *See* Ernst Fehr and Simon Gächter, *Fairness and Retaliation: The Economics of Reciprocity*, CESifo Working Paper No. 336 (March 2000). Parisi shows that negative reciprocity can also be ex ante efficient. While ex post negative retaliation can be regarded as punitive and destructive in nature, a credible pre-commitment to negative retaliation can be an effective deterrent against socially undesirable behavior. *See* Parisi, Genesis of Liability, *supra* note 37.

[48]*See* Parisi, Taxonomy, *supra* note 4.

reciprocity requires a pre-commitment by each player to a meta-strategy for the entire duration of the game.[49] In situations of stochastic reciprocity, cooperative strategies are likely to dominate, if there is a relatively high probability of future interaction and a relatively low discount rate of the players.[50] A higher probability of future interaction is more likely to increase the expected payoff from cooperation; a lower discount rate means that the future payoff is valued relatively highly in present value terms. Thus, both will increase the present value of cooperation.

Stochastic reciprocity is similar to Keohane's 'diffuse reciprocity', where an agent cooperates, not in expectation of a specific reciprocal reward, but some general reciprocal return in the future.[51] Either definition matches the environment in international law. The players are nations, who engage in repeated interactions with each other. Thus, the condition of a high probability of future interaction is fulfilled. It is reasonable to assume that states have low discount rates, since, in general, nations do have long lives and therefore long time horizons.

It is important to keep in mind that stochastic reciprocity could solve the problem of divergent preferences in certain cases; it will not solve the problem of a prisoner's dilemma. If the players were in a prisoner's dilemma, even in an iterated game, stochastic reciprocity would not change the usual results obtained in the Chain-store Paradox and the Folk theorem.[52]

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[49]Parisi terms this "silver reciprocity". *See* Parisi, Taxonomy, *supra* note 4.

[50]*Id.*

[51]*See* Keohane *supra* note 20.

[52]The so-called Chain-Store Paradox was first pointed out by Reinhard Selten, *The Chain-StoreParadox,* 9 THEORY AND DECISION 127-159 (1978). The paradox points out that in a repeated Prisoner's Dilemma game with a finite horizon, mutual defection is likely to dominate the game from the very first round of players' interaction. The result is logically derived through backward induction: since the last game is likely to be dominated by mutual defection, also the one-to-the-last game will induce defection (since there is no future cooperation to preserve). The same logic thus applies to all previous rounds of the game, all the way up to the first round. The

Thus, an induced reciprocity constraint will result in higher levels of cooperation in a Prisoner's Dilemma situation. Stochastic reciprocity will encourage cooperation in a situation where the players have divergent preferences. Structural reciprocity exists when the players interests are perfectly aligned; there is no need to impose any additional conditions, as the players will choose to cooperate in any case. Reciprocity constraints are ineffective, and might even have adverse effects, in inessential games, where the aggregate payoff is constant, or in the case of a unilateral game, where a player has a dominant strategy, whatever the strategy followed by the other players. We now turn to examples of these games, and reciprocity constraints in action.

## III. RECIPROCITY CONSTRAINTS IN PUBLIC INTERNATIONAL LAW

In this section we consider some examples from international law, and examine the role of reciprocity constraints in each. Reciprocity has powerful implications for many important domains in international law. First, we examine the Truman Proclamation as an example of a pure common interest game, which required no external reciprocity constraint. The custom that developed following the Truman Proclamation could be considered a example of structural reciprocity. Second, we consider the General Agreement of Tariffs and Trade ("GATT"), and the use by the United States

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so-called Folk Theorem, instead suggests that in the case of infinitely repeated games, cooperation may (but will not necessarily) obtain. Without a last period game, the backward induction logic of the Chain-Store paradox cannot be applied. The Folk Theorem tells us that in an infinitely repeated game, any pattern of behavior can be observed over a finite number of periods. The Folk Theorem has no paternity (hence, the name of the theorem, as part of the "folk wisdom" of game-theory). Contributions and mathematical elaborations of this theorem however include Benjamin Klein and Keith Leffler, *The Role of Market Forces in Assuring Contractual Performance*, 89 JOURNAL OF POLITICAL ECONOMY 615-41 (1981). For an accessible presentation of these concepts, see Eric Rasmusen, GAMES AND INFORMATION (2d ed. 1989) at 121-5.

of Section 301 of its Trade Act of 1974[53] as a tool to obtain reciprocal trade liberalization. The GATT regime is one of induced reciprocity, with some exceptions for developing countries and regional trading blocs. The United States has often used the threat of unilateral sanctions under Section 301 to obtain trade liberalization measures by its partners, liberalization that the partner was in fact obligated to undertake under GATT. Third, we consider the case of the Law of the Sea, as an example of stochastic reciprocity. Lastly, we consider the complex case of the Comprehensive Test Ban Treaty (CTBT). Depending on the player, this is treated as a different game: a prisoner's dilemma with monitoring problems; a state considering relative pay-offs; a divergent preference game, or a unilateral game. Not surprisingly, the reciprocity constraint in the treaty provides insufficient incentive for many of the key states to ratify, or even sign, the CTBT.

*A. Structural Reciprocity: The Truman Proclamation*

The Truman Proclamation is an illustration of a pure common interest game, with structural reciprocity.[54] In 1945, President Harry Truman issued a Proclamation with Respect to the Natural Resources of the Subsoil and Seabed of the Continental Shelf, which stated,

> [T]he government of the United States regards the natural resources of the subsoil and the sea bed of the continental shelf beneath the high seas but contiguous to the coasts of the United States as appertaining to the United States, subject to its jurisdiction and control.[55]

At the time this claim was made, it was not only novel, but inconsistent with existing international law, as Michael Byers points out, since no state had ever made a claim to the resources

[53] 19 U.S.C. § 2411.

[54] For an analysis of the Truman Proclamation in terms of reciprocity, *see also* Byers *supra* note 12 and Brownlie, *supra* note 11.

[55] Reproduced in 40 AM. J. INT'L L. SUPP. 45 (1946). *See also* Byers *supra* note 12 at 91.

of its continental shelf beyond twelve nautical miles.[56] Nonetheless, other states quickly followed the lead of the United States and made similar claims regarding their own continental shelves.[57] The claim assumed the form of a custom within a few years, which is a primary source of international law. The International Law Commission had included the right of coastal states over their continental shelves in a set of Draft Articles by 1951.[58] By 1958, the customary status of the claim was confirmed by its codification in the Geneva Convention on the Continental Shelf.[59] Thus, it took less than fifteen years for this claim to ripen into custom.

The explanation, in our framework, is quite straightforward. The claim by the United States was over its continental shelf. It did not preclude other coastal states from making the same claim; in fact, it allowed other coastal states to make the same claim with respect to their own continental shelves.[60] Further, as the claim did not require actual occupation or prescriptive use, all other coastal states could make the claim, without regard to the size of their own resources or strength. All coastal states stood to gain from making the claim, and no state lost anything from the United States making the claim. Thus, there was no reason for any coastal state to object to the initial claim made by the United States. In this case, the incentives of all coastal states were perfectly aligned, as in a pure common interest game, as described in Section II above. There was no need for an external enforcement mechanism; the alignment of the incentives of the parties was sufficient to create a binding custom in the case of the Truman Proclamation.

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[56] *See* Byers *supra* note 12 at 91.

[57] These included Mexico, Argentina, Brazil and Australia, among others. *See* Byers, *supra* note 12 at 91.

[58] Draft Articles on the Continental Shelf and Related Subjects, 2 Yearbook Int'l L. Com. 123,141.

[59] 499 U.N.T.S. 311.

[60] *See* Brownlie *supra* note 11.

*B. Induced Reciprocity: The GATT and US use of Section 301*

The prime example of induced reciprocity, is, of course, Article 21(1)(b) of Vienna Convention of 1969, which makes it a meta-rule for treaty law.

> Legal Effects of Reservations and of Objections to Reservations
> A reservation established with regard to another party . . . modifies those provisions to the same extent for that party in its relations with the reserving state.

A variant of induced reciprocity is found in the GATT, in the form of the most-favored nation[61] and national treatment clauses,[62] to counter the fact that trade liberalization often takes the form of a Prisoners' Dilemma.[63]

For economists, the welfare and efficiency gains from free trade, particularly in a full employment model are clear. The analysis of the gains from trade go back to Adam Smith[64] and David Ricardo.[65] A country specializes in the goods it has a comparative advantage in, and trades with other countries. In the basic model, the gains from specialization makes international trade a

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[61]General Agreement on Tariffs and Trade (1947 as amended) (hereinafter GATT), Art. I, which states in part:

> . . . any advantage, favour, privilege, or immunity granted by any contracting party to any product originating in or destined for any other country shall be accorded immediately and unconditionally to the like product originating in or destined for the territories of all other contracting parties. (Spelling in original).

[62] GATT Art. III, para 2:

> The products of the territory of any contracting party imported into the territory of any contracting party shall not be subject, directly or indirectly, to internal taxes or other internal charges of any kind in excess to those applied, directly or indirectly, to like domestic products.

[63]Sometimes trade liberalization can take the form of a unilateral game. See, e.g., Keohane, supra note _ at 13-16 (discussing why it was optimal for Great Britain to reduce its tariff levels, regardless of France's decision on its own tariffs).

[64]ADAM SMITH, AN INQUIRY INTO THE NATURE AND CAUSES OF THE WEALTH OF NATIONS (5th ed. 1789) (University of Chicago Press 1976, Edwin Cannan, ed.)

[65]DAVID RICARDO, THE PRINCIPLES OF POLITICAL ECONOMY AND TAXATION, (Irwin 1963) (1817).

positive-sum game, and free trade is a Kaldor-Hicks welfare gain.[66]

However, there are political and social costs to trade liberalization. Import-competing industries lose as a result of trade liberalization. These groups will lobby the government against trade liberalization.[67] Further, if one state lowers trade barriers, and the other state does not, the liberalizing state stands to lose politically. In any case, mercantilist sentiment is alive and well in most states, and the incentive to unilaterally defect, that is, maintain trade barriers, is always strong. Thus, trade liberalization begins to take the form of a Prisoners' Dilemma. Both parties would be better off under a regime of free trade, but each has a dominant strategy that will result in maintaining barriers to trade.

The MFN and national treatment clauses, though not reciprocity in the sense Keohane defines reciprocity,[68] or the way Swan interprets Keohane's definition,[69] nonetheless, fits Parisi's definition induced reciprocity. Swan defines reciprocity are requiring Country A to extend the same treatment to imports from Country B that Country B extends to its imports from Country A. This is specific reciprocity as Keohane defines it. But Swan's concern is more mirage than reality. The MFN

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[66]The models that explain gains from specialization and international trade are well-known and widely available; therefore, a detailed explanation is not provided here. A simple exposition of the basic models of international trade based on the notions of absolute advantage (from Smith), comparative advantage (from Ricardo), specific factors (also known as the Hecksher-Ohlin model) that remain the basis of much of the analysis of international trade can be found in Krugman and Obstfeld *supra* note 21. A Kaldor-Hicks gain is obtained by a move where the winners can compensate the losers. *See generally*, Mishan, *supra* note 15.

[67]*See* MANCUR OLSON, THE LOGIC OF COLLECTIVE ACTION (1965) (discussing the workings of interest groups). According to Olson, a small cohesive group faces lower organization costs and can lobby more effectively. Further, if costs are concentrated in a small group, while benefits are dispersed over a large group, such that the average loss is greater that the average gain (but total gain is greater than total loss), the small group could effectively lobby to prevent the action that would benefit the large group. Thus, in terms of trade liberalization, costs are borne by the import-competing industries, while gains are dispersed over all consumers. The average cost to each producer is greater than the average benefit to each consumer. But total gains are greater than total losses, as consumers vastly outnumber producers. Nonetheless, the producers could effectively lobby to maintain trade barriers.

[68]*See* Keohane *supra* note 20.

[69]*See* Swan, *supra* note 43.

clause[70] requires each nations must treat imports of goods, services and capital from all countries equally; the national treatment clause[71] requires that imports of goods, services and capital receive the same treatment as those of national origin.[72] These clauses, coupled with the multilateral nature of GATT, is sufficient to create an induced reciprocity constraint that will provide an incentive to countries to liberalize trade regimes, since all signatories reduce trade barriers equally with respect to all parties. In effect, the MFN will yield reciprocity of the sort that Swan defines, but through the route of multilateral obligations.

What the GATT regime does by creating a regime of induced reciprocity is eliminate the "sucker's payoff" in the Prisoner's Dilemma.[73] That is, it makes sure that a state will not find itself in the position where it has lowered its trade barriers, but its trading partners have not. However, in the real world, this may not be sufficient to get the players to the Pareto optimal outcome of free trade. First, the reciprocity constraint does not change the incentive of the import-competing groups to seek protection; that is, the public choice dynamics in this aspect remain unchanged. However, the reciprocity constraint does provide a counter balance, and the possibility of access to world markets through GATT arrangement provides an incentive for exporters to lobby legislators against protection.

Second, the induced reciprocity is not perfect, since the GATT permits exceptions,

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[70]GATT Art. I, *supra* note 61.

[71]GATT Art III, *supra* note 62.

[72]There are exceptions to this rule for developing countries, and for regional trading blocs, and free trade zones. *See* GATT Arts. XXIV( customs unions and free trade zones), XXXVI (developing countries).

[73]The sucker is the player who cooperates, while the other player defects. In terms of Figure 2, supra Part I, this would be Player A choosing Strategy I and Player B choosing strategy III. Player A will then receive a payoff of -2, while Player B gets 8. That is, Player A is the sucker. An induced reciprocity constraint of the form imposed by the MFN clause eliminates this possibility.

particularly for developing countries, in that it permits them to maintain higher tariff barriers for longer periods of time. The case of the exceptions is interesting, since it makes the induced reciprocity constraint imperfect. Thus, if the efficient outcome is to occur, a collateral sanction may have to be provided. Swan suggests that the threat of unilateral action by a big country, the United States, under Section 301 of Trade Act of 1974[74] acted as this collateral sanction that furthered trade liberalization goals.[75] Under Section 301, the President of the United States can impose tariffs and other trade sanctions unilaterally on the imports of a country that he had determined had committed any one of several transgressions that restricted access for US goods that was "unjustifiable"[76] or "unreasonable."[77] Swan claims that much of the use of Section 301 by the US, which has been denounced by other countries as unilateral action, was in cases where the sanctioned state had failed to abide by its obligations to lower its trade barriers.[78] Swan looks at a total of 43 case, where a Section 301 case was submitted for international dispute resolution, in the period from August 1988 to June 1998.[79] Of these, 31 cases had outcomes that were favorable to the United States, with 2 unfavorable, 4 incomplete and 6 that could not be classified.[80] In virtually cases, the American case rested on either or both of the following charges: the named foreign country had violated the terms of, or denied the benefits under the WTO (GATT) or other international agreement, terms that found their ultimate justification in a trade liberalization philosophy; or the foreign country maintained

[74]19 U.S.C. § 2411.
[75]*See* Swan *supra* note 43.
[76]19 U.S.C. § 2411(a)(1)(B)(ii).
[77]19 U.S.C. § 2411(b)(1)
[78]*See* Swan *supra* note 43.
[79]*Id.*
[80]*Id.*

unreasonably restrictive rules of access against American and foreign national to its economy.[81] Both charges support freer trade. Thus, according to Swan, on balance, the use of Section 301 yielded an advance toward global trade liberalization.[82]

Such a collateral sanction acts to balance domestic interest groups in favor of protection. Arguably, only a big country could have power to use such a sanction effectively, since access to its markets (the reciprocal condition) is a valued resource. Nonetheless, the potential for abuse is obvious, and Swan makes no claim that the US has no engaged in trade protection in its own right.[83] The most encouraging aspect of the entire regime is that despite these imperfections the successive rounds of GATT, and now the WTO, have succeeded in lowering global average tariff rates. Even the imperfect induced reciprocity of the GATT regime has assisted in the global move towards trade liberalization, with no relapses into tariff wars.

*C. Stochastic Reciprocity: The Law of The Sea*

Customary law, as discussed earlier, typically provides the best examples of stochastic reciprocity.[84] The Law of the Sea offers a striking example of custom in international law - though

[81] *Id.*

[82] *Id.*

[83] One of the more troubling facets of protectionist sentiment are the attempts to redefine reciprocity to trade balance with each trading partner. Such a definition clearly will not assist in getting nations out of the Prisoners Dilemma of trade liberalization.

[84] The medieval Law Merchant also provides an example of stochastic reciprocity, based on the possibility of role reversibility of the parties. During medieval times, the body of law that eventually can be to know as the law merchant (*Lex Mercatoria*) evolved as a response to the need of traveling merchants for a set of meta-rules that would govern their interactions in commerce with each other. The merchants acted as both buyers and sellers at this point in time, since the main form of business undertaken was a form of arbitrage. Merchants traveled from one town to another in order to exploit price differentials between the markets in the various towns. The merchants needed rules that would apply to their business transactions, as a means of increasing certainty in their transactions. The result was the law merchant, a body of private law, that applied uniformly to commercial contracts entered into by professional merchants. The merchants had a strong incentive to create laws that were 'fair', in that they favored neither the buyer nor the seller in any systematic manner, since each merchant could be either a buyer or a seller. Of

much of the customary law has been codified by the International Law Commission.[85] We consider two examples - the right of innocent passage, and the right of hot pursuit.

All states currently exercise some degree of sovereignty over a belt of sea adjacent to their coast-lines; this belt comprises the "territorial sea" of a nation.[86] But customary law gives foreign vessels the right of innocent passage through the territorial sea.[87] The Law of the Sea Convention says "[p]assage is innocent as long as it is not prejudicial to the peace, good order or security of the coastal state."[88] An earlier declaration had held, "[s]ubject to the provisions of these articles, ships of all states, whether coastal or not, shall enjoy the right of innocent passage through the territorial sea."[89] Brownlie considers the codification in the Conventions to correspond to customary law.[90]

The Convention on the High Seas, similarly, also codifies customary law.[91] We consider one example - the right of hot pursuit. According the Convention on the High Seas,

> The hot pursuit of a foreign ship may be undertaken when the competent authorities of the coastal State have good reason to believe that the ship has violated the laws and regulations of that State. Such pursuit may be commenced when the foreign ship . . . is within . . . the territorial sea or contiguous zone of the pursuing State, and may be continued outside the territorial sea or contiguous zone if the pursuit has not been interrupted. . . .
> The right of hot pursuit ceases as soon as the ship pursued enters the territorial sea of its own country or another state. [92]

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course, in the case of the law merchant, there was also a reputational cost to opportunistic behavior which violated the norm of reciprocity, which provided a collateral sanction for such behavior. *See* Parisi, Customary Law, *supra* note 14.

[85]This discussion is based largely on Brownlie, *supra* note 11at 180-257. *See also* KAROL WOLFKE, CUSTOM IN PRESENT INTERNATIONAL LAW (2d ed. 1993).

[86]Brownlie, *supra* note 11 at 180.

[87]*Id*. at 193-94.

[88]Law of the Sea Convention of 1982, Art. 19.

[89]Convention on the Territorial Sea of 1958, Art. 14.

[90]Brownlie, *supra* note 11 at 195.

[91]Convention on the High Seas of 1958.

[92]Convention on the High Seas of 1958, Art. 23 ¶¶1, 2.

These rules apply impartially to all countries. When it comes to either innocent passage, or the right of hot pursuit, a state can be on either side of the transaction. That is, the state could be the one exercising sovereignty over the territorial sea, or it could be the state of the flag of the ship. Thus, the state can both be seeking innocent passage through another's state's territorial sea, as well as be the one providing innocent passage. Similarly, the state could be the one engaging in hot pursuit, or the state of the flag of the ship being pursued. Further, the right of hot pursuit ceases at the territorial sea of another state. While this prevents the state from continuing pursuit, it also prevents other states from encroaching on its territorial sea under the justification of hot pursuit.

The Law of the Sea seems to have the two essential elements for a successful stochastic reciprocity condition - role reversibility and repeat interactions.[93] Each State can be on either end of a transaction, and undertakes similar transactions repeatedly. Thus, any attempt to cheat today is likely to rebound tomorrow, when the State is on the other side of the transaction. For example, limiting innocent passage through its own territorial sea by State A can result in other states limiting innocent passage to ships flying A's flag. This role reversibility why all nations respect the customs that have developed into binding legal practice. Similarly, role reversibility, in a multi-period game, also provides a sufficient incentive against systematically biasing the laws in any one direction. Thus, the element of role reversibility is akin to Rawls's "veil of ignorance."[94] Just as a Rawlsian veil of ignorance yields an outcome where the parties refrain from opportunistic behavior, so does role

[93] *See* discussion *supra* Part II.C

[94] JOHN RAWLS, A THEORY OF JUSTICE (1971). Rawls begins with postulating what he calls the original position, where all persons are equal. Then imagine that all persons choose together, in a single act, all the principles which are to assign basic rights and duties, and to determine the division of social benefits. However, this determination is made behind "the veil of ignorance," before any person knows their true position in society. According to Rawls, the principles that will emerge will be just, based on a notion of "justice as fairness." Since no-one knows what their position will be, there is no incentive to choose an assignment that favors any particular group. In the sense that the principles chosen will be fair, the social order that emerges will be just.

reversibility in a repeated game yield laws that are fair, in the sense that they do not contain systemic biases.

*D. When Reciprocity Fails: The Comprehensive Test Ban Treaty*

After two years of often contentious negotiations, the United Nations General Assembly adopted the Comprehensive Test Ban Treaty ("CTBT") on September 10, 1996.[95] The member of the treaty are prohibited from performing any nuclear weapons tests or allowing any nuclear explosion to take place within their jurisdiction.[96] These obligation are absolute; the Treaty is not subject to reservations.[97] The CTBT also sets forth a verification regime under article IV, and compliance measures under article V.[98] On September 24, 1996, over fifty countries, including the United States, Great Britain, France, China and Russia had signed the CTBT; signature and ratification by forty-four countries is required for the CTBT to go into force.[99] However, as of March 30, 2002 India and Pakistan had not signed the CTBT; and the US, China and Russia had not ratified the CTBT; ratification by all five, and eight others is required for the CTBT to go into force.[100]

The CTBT has a reciprocity condition built in: all members undertake a reciprocal obligation to end nuclear testing. The typical disarmament treaty can be treated as a Prisoners' Dilemma, with

[95]Comprehensive Test Ban Treaty (opened for signature September 24, 1996), U.N. Doc. A/50/1027, 35 I.L.M. 1439.

[96]CTBT Art. I.

[97]CTBT Art. VII.

[98]CTBT Arts. IV, V.

[99]The list of participating countries is in CTBT Annex 1, available at http://www.ctbto.org (last visited March 31, 2002). The full list of the essential countries is contained in CTBT, Annex 2, available at *http://www.clw.org/coalition/44keystates.htm* (last visited March 31, 2002).

[100]The following countries have not ratified the CTBT: Algeria; China; Colombia; North Korea; Congo; Egypt; India; Indonesia; Iran; Israel; Pakistan; the United States; and Vietnam. Of these, North Korea, India and Pakistan have not signed the CTBT. Available at http://www.ctbto.org (last visited March 31, 2002). Ratification by all these countries is required under CTBT Art. XIV.

the additional problem of monitoring.[101] If the monitoring problem can be solved, a reciprocity constraint that creates induced reciprocity should be sufficient to achieve cooperation.[102] But the reciprocity constraint has been insufficient for some states to sign the CTBT. India and Pakistan have both refused to sign the CTBT.[103] The United States Senate has refused to ratify the CTBT. The European nations, on the other hand, have embraced the CTBT, and most have ratified it. The different responses can largely be explained by different perspectives. Many of the participants are, in effect, playing different games. To those who have ratified, the CTBT reflects the solution to a prisoner's dilemma based on relative payoff; for those who have either not signed or ratified, it could be a matter of divergent preferences, or a unilateral game based on absolute payoffs.

The CTBT is not a typical disarmament treaty. First, there are two classes of states: those with nuclear weapons and those without. This is an important consideration in examining the strategies of nations: those nations that are considering absolute payoffs versus those that are looking at relative payoffs. Second, there is the disarmament element, which included the problem of monitoring. The different reactions of the states can viewed along these lines.

The European states, and possibly those in Latin America, and Africa could be considered as those looking at relative pay-offs. The non-nuclear states in western Europe are protected under NATO; the others face no immediate threat of nuclear war. For these states, the reciprocity

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[101] *See* Nicholson, *supra* note 26. William Aceves took this approach in his analysis of the CTBT in the institutionalist framework. *See* William J. Aceves, *Institutionalist Theory and International Legal Scholarship,* 12 AM. J. INT'L L.& POL. 227 (1997). This view fails to recognize the peculiar nature of the CTBT, in that the reciprocity constraint applies only to relative pay-offs, and thus maintains two classes of states: those with nuclear weapons, and those without such weapons.

[102] *See* Nicholson, *supra* note 26.

[103] India, which has persistently objected to the CTBT in its current form, was an original proponent of the CTBT in the 1950s, under its first Prime Minister Jawaharlal Nehru. *See* Jaswant Singh, *Against Nuclear Apartheid*, FOREIGN AFFAIRS, September/October 1998 (hereinafter, Singh, Apartheid).

constraint is sufficient to induce them to sign. The United States can be considered to be a case of Prisoners' Dilemma with a monitoring problem. There is some evidence from official statements that a major concern of the United States in ratifying the CTBT is the problem of monitoring and compliance. The truly interesting case is that of India.

India has persistently objected to the CTBT, as it has evolved, and has refused to sign it; Jaswant Singh said it imposed a regime of "nuclear apartheid."[104] India is, in fact, looking at absolute pay-offs when making its decision. The pay-off, in this case, has to take into account the nuclear arsenals of both Pakistan and China;[105] both states currently occupy territory that India claims. These concerns were clear in the Official Response of India of June 13,1998 to June 12 Communique by the "Group of Eight" Countries.[106] China, in particular, has a nuclear arsenal that is much larger than India's. As long as India is looking at absolute pay-offs, the reciprocity constraint of the CTBT will be insufficient to allay India's concerns about its national security, since the CTBT eliminates relative, not absolute discrepancies in nuclear power. From India's perspective, the CTBT is a unilateral game, if viewed from the perspective of relative payoffs that the treaty regime creates. Thus, the reciprocity constraint will not be sufficient to induce India to cooperate.

The other interesting aspect of the CTBT was the global response to India's nuclear tests in

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[104]*See* Singh, Apartheid, *supra* note 103. While the article cited expressed his personal views, it is worth mentioning that Singh, at the time of writing of this paper, is a Cabinet Member in the current Indian government.

[105]India and Pakistan are long term military rivals, and have fought three full scale wars, in 1948, 1865 and 1971. See Singh, Defending India, supra note 18. China invaded India in 1962. *Id.*

[106]Statement of the Official Spokesperson of the Government of India in Response to the June 12 Communique by the "Group of Eight" Countries, June 13, 1998, available at *http://www.clw.org/pub/clw/coalition/india0613.htm* (last visited March 31, 2002). *See also,* Communique by the "Group of Eight" Foreign Ministers on the India and Pakistani Nuclear Tests, June 12,1998, available at *http://www.clw.org/pub/clw/coalition/g80612.htm* (last visited March 31, 2002) (hereinafter G-8 June 12 Communique).

1998.[107] India is not a signatory to the CTBT; in fact it could qualify as a persistent objector. Nonetheless, even though India had not violated any treaty obligations, the Indian nuclear tests resulted in a chorus of condemnation, of which the June 12 Communique of the 'Group of Eight', was an example.[108] The statements at the 2000 meeting of the Preparatory Commission of the CTBT Organization, which met at the third anniversary of its establishment, suggest an answer: the CTBT, even though it was not in force, had perhaps established a global norm against nuclear testing.[109] However, if such a norm had been established, in the absence of reciprocity, it has to be in the nature of *jus cogens*, a peremptory norm, which over-rode India's objections. This seems implausible in view of the failure to ratify the CTBT by such important players at the United States and China.[110]

Even though a reciprocity constraint was not sufficient to achieve cooperation in the case of the CTBT, different forms of reciprocity play a critical role in international law. Reciprocity can either be structural or primary, as was the case in the Truman Proclamation; there is no need for an external enforcement mechanism in such cases. Reciprocity can be induced, that is imposed externally, as in the GATT regime. Reciprocity can be treated as an obligatory condition, where the sense of obligatoriness is internal, as was the case of the Law of the Sea. Reciprocity emerges as a key element in many of the interactions between states. We turn next to the issue of whether

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[107]Pakistan conducted nuclear test shortly afterwards.

[108]G-8 June 12 Communique, *supra* note 106.

[109]Preparatory Commission for the Comprehensive Test Ban Treat Organization Provisional Technical Secretariat, *Summary Report of Panel: CTBT Three Years On - Significance, Achievements, The Way Forward*, April 4, 2000, available at *http://www.clw.org/coalition/ctbto040400.htm* (last visited March 18, 2002) (hereinafter Panel Report). The CTBT was called the "second pillar of the non-proliferation regime" by the Panel. *Id.* at ¶ 9.

[110]See list of countries that still have to ratify, supra note 100.

reciprocity is a background rule to international law, a meta-rule, in effect.

## IV. RECIPROCITY AS A META-RULE FOR THE SYSTEM

To repeat the obvious, there is no overarching legal authority that governs the law of nations. Why, then, do nations generally follow the law?[111] There is war, indisputably, but war and raw power are not what determine the vast majority of dealings between nations. Cooperation, and peaceful resolution of disputes is what one generally observes.[112] From the discussion in Parts II and III, reciprocity is an important element in dealings between states. Is it possible to claim that reciprocity is a meta-rule for international law?[113]

The normative case for reciprocity is relatively easy to make. Nation-states can be regarded as repeat players that accumulate institutional knowledge, a reputation, and presumably, trust, over time. International law can be regarded as an iterated game, played by these repeat players, with low discount rates. Cooperation fostered by reciprocity is likely to yield higher return outcomes for these players than a strategy of conflict.[114]

We can make a positive case for reciprocity as well. A considerable body of evidence suggests that scholars, and states, accept reciprocity as a basic rule of international law. We start with considering the limits of authoritative sources of international law. According to the International

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[111] *See generally* Jianming Shen, *The Basis of International Law: Why Nations Observe*, 17 DICK. J. INT'L L. 287 (1999).

[112] *Id*.

[113] The discussion here is not about the validity of international law, or the source of international law. Thus, there is no discussion of the natural law school or the positivist school. The sole issue addressed is whether the notion of reciprocity is a basic rule of the system. For an excellent discussion of the historical development, *see* Shen *supra* note _. Shen reaches the conclusion that international law is ultimately the expression of the compromised wills of sovereign states, which is why they comply with the law more often than not.

[114] That is, in situations akin to the Prisoner's Dilemma, or Divergent Preferences, reciprocity constraints can be designed to foster cooperation.

Court of Justice, there are four sources:

> a. international conventions, whether general or particular, establishing rules expressly recognized by the contesting states;
> b. international custom, as evidence of a general practice accepted as law;
> c. the general principles of law recognized by civilized nations;
> d. subject to the provisions of Article 59, judicial decisions and the teachings of the most highly qualified publicist of the various nations, as subsidiary means for the determination of rules of law.[115]

In effect, the three major sources are treaties, custom and general principles of law. Treaty law is subject to reciprocity, under Article 21(b) of the Vienna Convention. Before turning to custom, let us consider the case of the general principles. Some of these were laid out in the Draft Declaration on the Rights and Duties of States of the International Law Commission. The theme of reciprocal recognition runs strongly through the Declarations. Consider Articles 2, 3, and 5 respectively:

> Art. 2. Every State shall have the right to exercise jurisdiction over its territory . . . .
> Art. 3. Every State has the duty to refrain from intervention in the internal or external affairs of any other State.
> Art. 5. Every State has the right to equality in law with every other State.[116]

These rights and duties are clearly reciprocal, even though the word itself never appears in the Declaration. Article 12 of the Declaration states that every state has the right to self-defense.[117] The reciprocity in this right is obvious; war, as Theodor Meron points out, is "paradigmatically interstate law, driven by reciprocity."[118]

Michael Byers holds that the principle of reciprocity is fundamental to the system of

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[115] Statute of the International Court of Justice, Art. 38 (1).

[116] Draft Declaration on the Rights and Duties of States of the International Law Commission available at http://www.un.org/law/ilc/texts/declar.htm (hereinafter Draft Declaration).

[117] *Id*. Art 12 states "[e]very state has the right of individual or collective self-defense against armed attack."

[118] Theodor Meron, *The Humanization of Humanitarian Law*, 94 AM. J. INT'L L. 239, 243 (2000).

international law.[119] International law itself emerges from a complex of bilateral relationships that are based on the consent of the states. Reciprocity is a fundamental aspect of bilateralism, since bilateral relationships inevitably involve some element of *quid pro quo*.[120] However, bilateral relationships make up a general rule, which is given added weight by customary practice. As rules are generalized, reciprocity is important as a background rule, in view of the legal equality of states. In the context of customary international law, any state claiming a right, has to accord the same right to all other states.[121] Thus, reciprocity is needed to maintain the generalized principle of sovereignty. Therefore, Byers treats reciprocity as a separate principle of international law.[122]

Jianming Shen also considers reciprocity a basic principle of international law, but using a different framework.[123] According to Shen, consent alone is not the basis of international law. Instead, international law is the expression of the will of states compromised, with gains and concessions taken into account.[124] However, reciprocity remains essential in maintaining this compromise.

Reciprocity as a fundamental concept underlying international law appears over and over again, particularly in the context of customary law. Customary law is typically subject to reciprocity constraints, as demonstrated by the Law of the Sea.[125] Karol Wolfe points out that customary law remains a important source of legally binding practice in international law.[126] Treaties are an

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[119]*See* Byers, *supra* note 12 at 88.
[120]*Id* at 89.
[121]*Id*.
[122]*Id*. at 90.
[123]*See* Shen *supra* note 111.
[124]*Id.*
[125]*See* discussion *supra* Part III.C.
[126]*See* Wolfke, *supra* note 85.

expensive and difficult way to create rules; custom remains more flexible.[127] In virtually all cases where custom had been identified, the reciprocal nature of the practice is clear. As the International Court of Justice ("ICJ") said,

> . . .[an] essential element for the practice of states to acquire the status of customary law is that such state practice must be common, consistent and concordant.[128]

Conventions can grow into custom, and are then applied on a reciprocal basis, as was the case in the Nuremberg trials after World War II. At that point, the issue whether aggressive war had been illegal and criminal under international law prior to 1945 arose.[129] The Counsel for the Defendants claimed that the principles laid down in the four power London agreement were treaty law, to which Germany was not a signatory.[130] The tribunal reasoned that wars of aggression were illegal under customary international law, citing the Kellog-Briand Pact,[131] to which Germany was a signatory, and how the Hague conventions had grown into customary law.[132] Thus, the law could be applied on a reciprocal basis to Germany.[133]

Violations of norms of reciprocity can then considered violations of the law. Unilateral defections from the norm are viewed with disapprobation, and typically have at least reputational consequences. In the modern context, sometimes the defecting state can be subject to sanctions that exceed more than mere disapprobation; the state can be haled into the ICJ, if it has chosen to submit

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[127]*Id*.

[128]North Sea Continental Shelf Cases (1969), 3 I.C.J. Reports 42.

[129]*See* Oscar Schacter, *In Defense of International Rules on Use of Force*, 52 U. CHI. L. REV. 113,114-115 (1986).

[130]*Id.* at 115.

[131]Kellog-Briand Pact, August 27, 1928, 46 Stat 2343 (The Treaty For Renunciation of War as an Instrument of National Policy).

[132]Schacter *supra* note 129at 115.

[133]*Id.*

itself to the ICJ's jurisdiction. Of course, the matter of the ICJ jurisdictions itself has an element of reciprocity.

Consider the case of United States v. Nicaragua.[134] Both countries had declarations that subjected them to the jurisdiction of the ICJ.[135] On April 6, 1984, hearing that Nicaragua was going to bring suit, the United States deposited a declaration with the United Nations purporting to exclude it accepting ICJ jurisdiction over any dispute with a Central American state for two years, despite its 1946 Declaration that contained no such reservation, and was expressed to be subject to be terminable with six months notice.[136] The United States based its claim on a reading of reciprocity of Nicaragua's declaration that contained no notice provision; the United States argued that meant that Nicaragua could terminate at will, and therefore the United States' obligation could not be any greater.[137] By a vote of 15 to 1, the ICJ decided on November 26, 1984, it had jurisdiction to entertain the case brought by Nicaragua against the United States, charging the United States with violations of international law through use of military force.[138] The ICJ decided that reciprocity was a jurisdictional requirement under Article 36, paragraph 2, and it applied to declarations made without reservations of reciprocity.[139] The ICJ rejected the argument made by the U.S., saying that the legal consequence of the condition of reciprocity was that the parties were placed on an equal footing, and that

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[134]Military and Paramilitary Activities in and Against Nicaragua (Nicaragua v. Unites States), 1984 I.C.J. Rep. 392 (judgment of Nov. 26).

[135]*See* Herbert W. Briggs, *Comment: Nicaragua v. United States: Jurisdiction And Admissibility*, 79 AM. J. INT'L L. 373 (1985).

[136]*See* Anthony D'Amato, *Comment: Modifying U.S. Acceptance of The Compulsory Jurisdiction of the World Court*, 79 AM. J. INT'L L. 385, n.9. (1985).

[137]*See* Briggs *supra* note 135.

[138]*See* Briggs *supra* note 135; D'Amato, *supra* note 136.

[139]*See* Briggs *supra* note 135; D'Amato, *supra* note135.

identically phrased declarations were not required.[140]

Inevitably, there was talk of modifying the U.S.'s obligation following this decision by the ICJ. In considering possible modification, Anthony D'Amato cautioned against restrictions that were too broad, point out that

> A declaration accepting the World Court's compulsory jurisdiction is as much an offensive weapon against the legal delicts of other states as it is a defensive weapon; . . . .Because of the principle of reciprocity, any substantive exception from compulsory justification will reduce opportunities to use the [International] Court [of Justice] offensively against other states: . . . [141]

What D'Amato is pointing to is the possibility of role reversal, and repeated interactions - a situation where reciprocity constraints are effective in inducing cooperation. He lists a number of areas where international law has grown from custom, including boundaries of nations at land and at sea, succession of government, slavery, diplomatic privileges and immunities, validity of international treaties, and enforcement of foreign judgments, among many others.[142] He continues to say

> The rules of international law . . . were not imposed on states from on high, but rather grew out of their interactions over centuries of practice and became established as customary international law. Thus, the rules, almost by definition, are the most efficient possible rules for avoiding international friction and for accommodating the collective self-interest of all states.[143]

A basic principle of customary law, as discussed above, is reciprocity. Further, the Vienna Convention imposes reciprocity on all international law created by treaty.[144] The generalized principles of international law, as demonstrated by the Draft Declaration.[145] And reciprocity remains

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[140]*See* D'Amato *supra* note 136.

[141]D'Amato *supra* note 136at 386.

[142]D'Amato *supra* note 136 at 401.

[143]*Id.* at 402.

[144]Vienna Convention, Art. 21(1).

[145]*See* Draft Declaration, *supra* note 116.

a key meta-rule in maintaining a reasonably well-functioning system of international law.[146]

## CONCLUSION

In this paper, we examined the role of reciprocity in international law, which is a system without an overarching legal authority to enforce rules. Using a game theoretic approach, we delineated several classes of games. Three different types of reciprocity constraints were defined, and their application to the problems identified in the classes of games was considered. Reciprocity constraints can resolve many issues in international law, but are not a panacea. However, given the nature of international law, with a fairly small number of repeat players, with low discount rates and institutional memory, it is reasonable to consider whether reciprocity can become an underlying principle of the system. We considered some evidence, and came to the conclusion that there is support for the hypothesis that reciprocity is a meta-rule for the system of international law.

[146] One aspect of customary law is its continuing evolution. Thus, it is plausible that new norms develop over time. The case of India's nuclear tests in 1998 could also be seen as a violation of a developing international norm. *See* discussion *supra* Part III.D. Similarly, the Hague conventions and other declarations have helped influence the formation of humanitarian law. *Opinio juris*, in the form of verbal statements by government officials; the content of resolutions and declarations, and the consent of states to instruments will clearly influence the development of this law. It is worth noting Meron has an underlying belief that these customs will be reciprocal. *See* Meron *supra* note 118. This is a belief that is shared by the panelists of the CTBTO with respect to nuclear testing, whether or not the CTBT comes into force as a treaty. *See* Panel Report, supra note 109.