



FACULTY OF LAW  
Lund University

Simon Bengtsson

# Why Do States Comply?

a Game Theoretic Approach to International Law

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*Supervisors:* David Dryselius, Per Nilsén

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## **Abstract**

The absence of a central enforcement mechanism in international law has often raised the question of why international law is complied with. Several possible motives and whole theories have been put forth to explain it. This thesis is an attempt at demonstrating how international law can be upheld even if the actors within the legal system are self-interested rational actors. The model is constructed within a rational choice framework. Finally it is shown how under certain conditions, mutual compliance can be achieved.

## **Sammanfattning**

Frånvaron av en central mekanism för att försäkra reglers efterlevnad inom folkrätten har ofta väckt frågan om varför reglerna faktiskt efterlevs. Flera möjliga motiv och hela teorier har föreslagits som förklaringar. Den här uppsatsen är ett försök att demonstrera hur folkrätten kan upprätthållas även om det skulle vara så att det folkrättsliga systemets består av rationella egennyttiga aktörer. Slutligen visas hur vissa förutsättningar leder till att folkrättsliga avtal kan upprätthållas.

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# 1. Introduction

## 1.1. Motivation

As opposed to domestic legal systems, the international one lacks a central enforcement mechanism. This issue is fundamental to the functioning of the legal system—without some kind of certainty of consequences of one’s actions, what incentive is there to comply with the agreements one has entered into? And yet, states do generally comply. The motivation to write this essay stems from the lack of treatment this topic gets in introductory courses to public international law. The explanations that are given usually seem at odds with the common sense view of states as self-interested entities.

## 1.2. Aim

The aim of this essay is to explore how the compliance with international law by states that is generally observed can be explained in a rational choice framework with the help of game theory. A full theory of international law can hardly be captured in a bachelor’s thesis but hopefully the models constructed can be appreciated as an addition to the body of evidence for such a theory.

## 1.3. Delimitations

Due to limited time for writing this thesis, only a single case has been studied. To make the underlying theory completely credible it would be appropriate to use a combination of case studies and statistical analysis of large data sets. The model contains estimates of the values that potential outcomes have for the international actors. While these are intended to be reasonable in their magnitudes, they are fundamentally guesses. Much research would be needed before anything could be said about how much a state values one outcome or another.

## 1.4. Method and material

This thesis takes an interdisciplinary approach to the question of compliance in international law. A game theoretic model of an agreement within the international legal system is constructed based on the agreement itself and surrounding documents. Much of the application of game theory draws on the work of Andrew Guzman and especially his 2008 book *How international Law Works: A Rational Choice Theory*. The model is constructed within a rational choice framework, meaning it relies on rational choice assumptions. Further assumptions are made about what the actors in the model value and how much they value it. This is a weakness in the model but an inevitable one in a bachelor’s thesis due to the difficulty of making such estimates. However, the model does work as proof-of-concept, showing how cooperation can be possible with public international law (henceforth just “international law”). Even if the estimates are not perfectly true to reality, small modifications of them should not cause any change in the results.

## 2. Background

### 2.1. The problem with international law

To understand why the question of compliance has been the subject of so much writing, consider Henkin's summing up of what an observer might at first glance criticize international law for:

The society of nations has no effective law-making body or process. General law depends on consensus: new law, at least, cannot be imposed on any state; even old law cannot survive if enough states, or a few powerful and influential ones, reject it.<sup>1</sup>

Andrew Guzman puts forward a similar question specifically concerning the United States: "Why would a 'legal obligation' for which there are no obvious enforcement mechanisms affect the behavior of the world's most powerful country?"<sup>2</sup>

Anders Henriksen in his textbook on international law attempts to answer some questions of such a nature. Henriksen argues that the international legal system is necessary for state sovereignty. He earlier makes a distinction between "international law of cooperation" and "international law of coexistence" where the former is voluntary and the latter is necessary.<sup>3</sup> But a law that is voluntary can by definition not be "necessary" for sovereignty. The latter type does seem to uphold sovereignty. However, this is only true if one sees the international arena as a whole, taking into account the sovereignty of each state. A single state does not necessarily look at it from this perspective. Before the ban on the use of force was established, some states can even be said to have had "more" sovereignty than states in the present. During the 13th century, the Mongolian empire expanded tremendously through the use of force. Could anyone claim that the Mongols had less sovereignty than today? Rather the opposite. Their ability to choose to conquer other lands no longer exists. From the perspective of a militarily weak state, international law of coexistence might be necessary to maintain its sovereignty but this does not hold true in general.

As Louis Henkin noted in 1968, "it is probably the case that almost all nations observe almost all principles of international law and almost all of their obligations almost all of the time".<sup>4</sup> It is, however, not enough to just observe general but somewhat sporadic compliance if one wants to enter into a treaty which entails risks for oneself. For that, a state would want some way of predicting compliance.

A theory of law tries to explain why states comply. One reason the question arises in the first place is that there is no superior entity in the international legal system to enforce its norms.<sup>5</sup> Under such circumstances, one would expect that "the powerful exact what they can, while the weak yield what they must"<sup>6</sup>, as the Athenians remark in defense of

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<sup>1</sup>Henkin 1968, p. 25.

<sup>2</sup>Guzman 2008, p. 5.

<sup>3</sup>See Henriksen 2017, pp. 10–13.

<sup>4</sup>Henkin 1968, p. 42.

<sup>5</sup>Cf. Dixon 2013, p. 6.

<sup>6</sup>Thucydides 1921, p. 159.

their siege of Melos in Thucydides' dramatization of the Peloponnesian War, long before anything with the name international law existed and as we saw in practice with the Mongolian empire. John Austin, in his "command theory", defined law as the command of a sovereign backed up by sanctions.<sup>7</sup> Sanctions do exist in the international legal system but not in the same way as within a country. International law is not *generally* enforceable.<sup>8</sup> If having an obligation is equated with being likely to suffer sanctions or punishment for one's disobedience then international law is not binding. This is, however, not the only way to view obligation. Herbert Hart has argued that whether or not one is likely to suffer for one's disobedience of a rule and whether or not one has an obligation to act according to said rule are two different questions. The latter question concerns an *internal normative* statement, meaning its truthfulness should be judged "from the point of view of rules accepted as guiding standards of behaviour".<sup>9</sup> However, this does not mean that Hart considers international law to be "true law". He notes that international law lacks secondary rules for how to properly change the law, for adjudication and for determining what the sources of the law are.<sup>10</sup>

## 2.2. History of theories of international law

International law first began to be developed by an Italian living in England, Alberico Gentili. He wrote a treatise in which he claims that international law is based on the law of nature and of nations. He also developed his theories further in his writings on the law of war.<sup>11</sup> More specifically, Gentili argued that there was an *international society* in which all states were included, but not private individuals. This distinguishes classical *jus gentium* from modern international law.<sup>12</sup>

Hugo Grotius has many times been credited as the "father of international law".<sup>13</sup> When it comes to the foundations of international law and law in general, Grotius argues, according to Stein, that the basis of it lies in the "nature of man" and that the foundational principles of international law are "axiomatic and self-evident". The material content of international law can then be found either by deriving it directly from the foundational principles or by observing those rules that are practiced by all "civilised people".<sup>14</sup> It is, however, one thing to establish what the sources of law are and its content and another to insist on the obligatory status of said laws. Here, Grotius on the one hand relies on the will of God to argue that morally right laws are necessary to observe but he also draws on the work of Suarez to say that there is an *inconsistency* in breaking the natural law without doing something wrong. To act against one's own conscience is to be guilty of inconsistency, which would make a person less human. Grotius himself argues that there is an obligation to perform such acts that contribute to our rationality, sociability

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<sup>7</sup>See Henriksen 2017, p. 5.

<sup>8</sup>See Dixon 2013, p. 6.

<sup>9</sup>See Hart and Raz 1994, pp. 217–218.

<sup>10</sup>See Hart and Raz 1994, p. 214.

<sup>11</sup>See Stein 1999, pp. 96–97.

<sup>12</sup>See Vadi 2014, p. 146.

<sup>13</sup>Cf. Koh 1997, p. 2606; Vadi 2014, p. 137.

<sup>14</sup>See Stein 1999, p. 99.

or need for self-preservation. Evil acts produce an imbalance in society so for society to be healthy such acts need to be punished.<sup>15</sup> On the other hand, who says society has to be healthy by Grotius' standards? As Cardinal Richelieu is purported to have remarked to him, "the weakest are always wrong in matters of state."<sup>16</sup>

Koh identifies four strands of thinking about "the compliance question" around the turn of the 19th century and neatly summarizes them in this paragraph:

The first was an Austinian, positivistic *realist* strand, which suggests that nations never "obey" international law, because "it is not really law." The philosophical tradition of analyzing international law obligation had bifurcated into a Hobbesian utilitarian, *rationalistic* strand, which acknowledged that nations sometimes follow international law, but only when it serves their self-interest to do so, and a *liberal* Kantian strand, which assumed that nations generally obey international law, guided by a sense of moral and ethical obligation derived from considerations of natural law and justice. Bentham's international law writings suggested a fourth, *process-based* strand, which derived a nation's incentive to obey from the encouragement and prodding of other nations with whom it is engaged in a discursive legal process.<sup>17</sup>

In his 1927 Hague Lectures, Alfred Verdross identifies *commonality of values and interests* as the reason for compliance. The following year, James Brierly built on Verdross' ideas in his own lectures in the Hague. He argues that *the need to preserve solidarity between states* is the reason for their compliance with agreements. This can be called the "solidaristic strand".<sup>18</sup> A noteworthy aspect in these two theories is that they manage to explain how it can be that states tend to comply with their agreements without relying on natural laws. However, one might wonder why a state under any circumstance would violate their international obligations if their theories are correct. Should a state with values different from the one they are entering into a treaty with expect the treaty to be breached?

After the Second World War, Herbert Hart argued that since international law has no "secondary rules" concerning legislation and adjudication and no "rule of recognition" determining what the sources of international law are<sup>19</sup> it is impossible to say in advance whether or not a certain rule will be accepted as *valid* but only wait and see.<sup>20</sup>

A strand of thinking that developed in the United States was that of *legal process*, which followed two branches, both of which agreed that the process of interaction between states in the available fora is at the heart of why states tend to comply. Through this process, claims of legal authority can affect actual behavior of states.<sup>21</sup> Henkin, who was a major contributor to one of the branches, writes of how the acceptance of international law into

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<sup>15</sup>See Miller 2014.

<sup>16</sup>See Miller 2014.

<sup>17</sup>Koh 1997, p. 2611.

<sup>18</sup>See Koh 1997, p. 2613.

<sup>19</sup>See Hart and Raz 1994, p. 214.

<sup>20</sup>See Hart and Raz 1994, pp. 234–235; Cf. Koh 1997, p. 2616.

<sup>21</sup>See Koh 1997, pp. 2618–2621.



national law and national institutions is of great importance for compliance. Once it is accepted, it will be reflected in national law and those in government and in institutions will take it into account. “With acceptance comes observance, then the habit and inertia of continued observance”.<sup>22</sup>

In the 1990s, something called *Regime Theory* became popular as an explanation for why states comply or, at least, how compliance can be improved. International law opens up channels for dispute settlement, can trigger retaliatory actions and can require states to provide information about how well they have complied with a certain piece of legislature which in itself can help foster compliance.<sup>23</sup>

*Rationalistic Instrumentalism* emerged after the Cold war and uses rational choice theory to show how states act out of self-interest.<sup>24</sup> Critics have accused rationalistic instrumentalists of presenting the pursuit of self-interest as a right and a duty.<sup>25</sup> However, it need not necessarily be interpreted that way. A distinction between description and prescription should be made. This thesis aims not to say that one thing or the other is right, but merely to demonstrate how cooperation is possible between selfish actors.

### 2.3. Game theory

Rationalistic instrumentalism often relies on the framework of *rational choice theory*.<sup>26</sup> This entails a number of assumptions, mainly that actors are rational, self-interested and able to identify and pursue their interests.<sup>27</sup> If the assumptions are adopted game theory becomes applicable. Game theory is the study of rational choice in interactions with other rational decision makers.<sup>28</sup>

The *game* in game theory refers to any situation where an outcome is dependent on the actions of others and where those involved are aware of this fact. Because of this awareness, it is possible to make predictions of what actions the others will take and adjust one’s behavior based on it.<sup>29</sup> The actors in a game are referred to as *players*.

There are three fundamental components to a game: the *strategies* available to the players, the *information* they have and their *objectives*. Strategies are sets of actions a player can undertake in the game. The information in question is the rules of the game, which include the list of players, the strategies available to them, the payoffs each player gets in any outcome of the game and knowledge of the other players being rational. Payoffs are numbers that represent the value an outcome has to a player based on everything that the player cares about (its objectives). They may either be based on a ranking of the outcomes relative to each other or correspond to the true value of the outcome, such as how much economic profit the outcome results in for the player. A general unit for measuring satisfaction of objectives called *utility* may also be used. For

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<sup>22</sup>See Henkin 1968, p. 57.

<sup>23</sup>See Koh 1997, p. 2625.

<sup>24</sup>See Koh 1997, p. 2632.

<sup>25</sup>See Danchin 2008, p. 81.

<sup>26</sup>See Koh 1997, p. 2632; Cf. Guzman 2008, p. 17; Guzman 2002, p. 1829.

<sup>27</sup>See Guzman 2008, p. 17.

<sup>28</sup>See Dixit, Skeath, and Reiley, Jr. 2015, p. 5.

<sup>29</sup>See Dixit, Skeath, and Reiley, Jr. 2015, p. 18.

a player to be rational simply means that it will pursue that strategy which maximizes its payoff. This assumes that the player in question has complete knowledge of its own interests and can calculate what actions will be most likely to fulfill them.<sup>30</sup>

A rational player is not by definition selfish. It might care about the interests of another player being fulfilled. A parent might for example value the well-being of their child highly so a strategy of sacrificing resources for the child may very well be rational. A player that is selfish can be said to be *self-interested*. This means that it is unconcerned with the welfare of other players.<sup>31</sup> In this thesis, states are assumed to be self-interested.

Games can be divided according to whether the players make their moves at the same time, in ignorance of the other's choice, or one after the other, knowing what move the other has chosen. The former type is known as a *simultaneous game* and the latter a *sequential game*.<sup>32</sup>

Games can also be one-shot or repeated. A one-shot game is played once so the players do not need to worry about future repercussions of their actions. A repeated game is played more than once. It can be said that the game consists of *periods*. In a repeated game a player might abstain from a high payoff in the present in order to get a higher one in the future. A repeated game can be finitely repeating or infinitely repeating.

## 2.4. Applicability of game theory to the international legal arena

In the following sections, a model based on rational choice assumptions will be developed. While assumptions by definition are assumed to be true, it can be good to give them some justification.

Do states act rationally in the sense of maximizing their chances of reaching their goals? Many individuals are involved in states' decision making. Sometimes an apparently irrational move may become rational with a more expanded definition of the state. It is possible that in some countries special interests are essential in the decision making of the state. One could then either choose to see them as part of the state or as changing its preferences. In general, states also have plenty of time to decide on a course of action and so will not act impulsively. Concerning the knowledge of rules, states should be expected to know much of what there is to know based on experience.

Game theory is sometimes used to model human economic behavior and particularly economists have been criticized of using "Econs" in their models instead of Humans, where the former are purely selfish actors.<sup>33</sup> There is, on the other hand, no reason to think that states should be averse to other states suffering losses. According to the *realists* of international relations studies, for example, the core concern for a state and the ultimate goal of all its actions is security.<sup>34</sup> Even writers who are not realists have made use of the assumption of self-interest.<sup>35</sup>

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<sup>30</sup>See Dixit, Skeath, and Reiley, Jr. 2015, pp. 27–32.

<sup>31</sup>See Guzman 2008, p. 17.

<sup>32</sup>See Dixit, Skeath, and Reiley, Jr. 2015, p. 20.

<sup>33</sup>See e.g. Kahneman 2011, Section "Bernoulli's Errors".

<sup>34</sup>See Guzman 2008, p. 18.

<sup>35</sup>See e.g. Abbott 1989, p. 349.

## 3. Privacy Shield - a single iteration model

### 3.1. Is it law?

As an example of how compliance with international law can be understood through game theory, a model of the Privacy Shield agreement between the United States and the European Union will be constructed.

The Privacy Shield agreement is a political agreement<sup>36</sup> and as such one may question whether it really is law.<sup>37</sup> It does, however, have strong similarities to law in that it attempts to coordinate the actions of states and has an oversight mechanism for “confirming compliance or remediation of any non-compliance” in the form of an Ombudsperson.<sup>38</sup> Regardless of what differences may exist between the hard law of treaties and the Privacy Shield agreement, the model will be the same.

### 3.2. Payoffs

The central purpose of the Privacy Shield agreement is to allow self-certified American organizations to transfer personal data from “EU data subjects” to the United States provided that they adhere to a set of principles.<sup>39</sup> This makes it easier for them to conduct business on the European market. However, it might also limit their ability to profit. For this reason, the United States would prefer if the companies did not have to abide by the principles.

Another reason the United States might prefer to not abide by the principles is to improve national security. The *Safe Harbor* agreement existed before Privacy Shield and served the same purpose. Talks of renewing it had been going on since the Snowden revelations. The European Commission, in a communication to the European Parliament and Council, had raised concerns that although the Safe Harbor agreement allowed for processing of data for the purposes of *national security* and related issues, the large scale on which it was done was not what had been in mind. The Commission called it “beyond what is strictly necessary and proportionate to the protection of national security as foreseen under the exception provided in the Safe Harbour Decision”.<sup>40</sup>

Safe Harbor was finally terminated after the Court found that it did not fulfill article 25 of Directive 95/46/EC which demands an “adequate level of protection” for “the private lives and basic freedoms and rights of individuals”.<sup>41</sup>

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<sup>36</sup>See European Data Protection Supervisor 2016, p. 5.

<sup>37</sup>Cf. Guzman 2008, p. 142.

<sup>38</sup>See “Commission Implementing Decision of 12.7.2016 pursuant to Directive 95/46/EC of the European Parliament and of the Council on the adequacy of the protection provided by the EU-U.S. Privacy Shield”, (118).

<sup>39</sup>See “Commission Implementing Decision of 12.7.2016 pursuant to Directive 95/46/EC of the European Parliament and of the Council on the adequacy of the protection provided by the EU-U.S. Privacy Shield”, (14)–(15).

<sup>40</sup>See *Communication from the Commission to the European Parliament and the Council on the Functioning of the Safe Harbour from the Perspective of EU Citizens and Companies Established in the EU*, COM(2013) 847 final 2013.

<sup>41</sup>C-362/14 *Maximilian Schrems v Data Protection Commissioner* EU:C:2015:650.

One major interest of the European Union might be to maintain good relations with the United States in general<sup>42</sup>, relations which would certainly be damaged if important American companies had difficulties conducting business on the European market. The Privacy Shield agreement provides protection only for EU data subjects.<sup>43</sup> There may be several subtle reasons why the European Union wants to make sure that the personal data of their citizens have the same level of protection abroad as in the home market. If American companies can sell personal data to data brokers in the United States but European companies cannot then American companies have an economic advantage. There are, however, also European companies which benefit from a data transfer agreement such as Privacy Shield. The European Parliament writes in a resolution:

[...] small and medium-sized enterprises (SMEs) represent the fastest-growing sector of the EU's economy, and are increasingly dependent upon the free flow of data; whereas SMEs accounted for 60 % of the companies relying on the Safe Harbour agreement, which allowed them to benefit from the streamlined and cost-effective compliance procedures<sup>44</sup>

This far in the thesis there has been no attempt at quantifying the utility a data transfer agreement would carry for either of the parties and indeed, such a quantification can be very difficult. It would mainly entail estimating the monetary value of having an agreement relative to not having one for both parties. This is well outside the scope of this thesis. A simple ranking of the alternatives will suffice for this section. The next one could benefit from payoffs that correspond more closely to their true values and so reasonable values will be used.

### 3.3. The payoff matrix

Either player can choose to comply with or to violate the agreement, implying four potential outcomes. The United States would prefer to violate it while the European Union complied; that is, to be able to make use of the Europeans' data as they wish and to do so with the ease of a self-certification system. Their second choice would be the outcome where both comply. They would then have access to easy transfer of data albeit be more limited in what they can do with it. The third best outcome is when both players chose to violate. The American companies would still be able to transfer personal data but would have to do so under the provisions of the General Data Protection Regulation (Regulation 2016/679). Article 46 allows for the transfer of data "only if the controller or processor has provided appropriate safeguards, and on condition that enforceable data subject rights and effective legal remedies for data subjects are available". The least preferred outcome for the United States would be if they complied while the European Union violated the agreement.

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<sup>42</sup>Cf. *European Parliament resolution on transatlantic data flows (2016/2727(RSP))* 2016, Point 2.

<sup>43</sup>"Commission Implementing Decision of 12.7.2016 pursuant to Directive 95/46/EC of the European Parliament and of the Council on the adequacy of the protection provided by the EU-U.S. Privacy Shield", (16).

<sup>44</sup>*European Parliament resolution on transatlantic data flows (2016/2727(RSP))* 2016.

Table 1: Payoff matrix for Privacy Shield

		United States	
		Comply	Violate
European Union	Comply	(55, 110)	(40, 120)
	Violate	(51, 90)	(50, 100)

What would it mean for the European Union to violate the agreement? Transfer of personal data would still be possible but companies would have to fulfill the requirements of article 46 GDPR. If the European Union were to start enforcing article 46 on Privacy Shield-certified American companies the companies would have to enact costly adaptations of their structures. European companies might suffer slightly but they might also gain a small *relative* competitive advantage against their American counterparts while the latter adjust their internal workings to comply with article 46. This could result in a bigger market share within the European Union. However, relations with the United States would be degraded. It would thus seem that the outcome where the European Union violates the agreement while the United States complies is less preferable than the one where both comply. The outcome where both violate it is less preferable than the one where both comply because companies in both markets lose out on the ability to smoothly transfer data. The worst outcome would be if the European Union complied while the United States chose to violate; that is, if the United States made use of the data counter to the agreement while the European Union continues to allow self-certified companies to transfer personal data.

All of the payoffs can be seen in the payoff matrix in table 1. The first number within the parenthesis represent the payoff for the European Union and vice versa. Payoff matrices are used for simultaneous games<sup>45</sup> and while it is difficult to place Privacy Shield in either the sequential or simultaneous category, the fact that compliance is reviewed once a year (more on this in section 4.1) means that the decision making can be seen as taking place over the full year.

The relative magnitudes of the payoffs are meant to be reasonable guesses of their actual values based on the preceding discussion. The general difference in magnitude between the payoffs for either player represents a difference in how much they value the whole self-certification system. It does not affect the results.

### 3.4. The rational strategies

Simply by looking at the payoff matrix it is possible to understand what a rational player will choose as their strategy. For the European Union, it will maximize their utility to comply if the United States complies ( $55 > 51$ ) and to violate if the United States violates ( $50 > 40$ ). They will, however, have to make a prediction of what the United States will do.

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<sup>45</sup>See Dixit, Skeath, and Reiley, Jr. 2015, p. 92.

For the United States, there exists a *dominant strategy*; that is, a choice that will be the best one regardless of what the European Union does. If the European Union violates, the United States should also violate ( $100 > 90$ ) but even when the European Union complies, the United States should violate because then they will gain 120 utility points, as opposed to just 110 if they comply.

Since all parties have full knowledge of the game, they can predict the other's actions. The European Union knows that the United States will violate the agreement and so will do the same. This is their *equilibrium strategy* or *best response*. The outcome where both players violate is a *Nash equilibrium* – a set of strategies where neither player can improve their payoff by switching to another strategy on their own.

This model presupposes that the game is only played once; that is, there is only one time when the choice between violation or compliance has to be made or there are several but the players are indifferent to what will happen in the future. In the next section, a model where the players do care about their long-term interest is developed.

## 4. A repeated game of Privacy Shield

### 4.1. Repeated games

In practice, the agreement between the European Union and the United States will likely continue to exist for a long period of time which means it can be modeled as a *repeated game* consisting of several periods of play. In fact, there is a mechanism by which the agreement is reviewed each year: the *Annual Joint Review*. The mechanism by which the Privacy Shield agreement can be suspended is detailed in section 7 of the European Commission's Implementing Decision. First of all, if the Commission finds out about a breach through the checks put in place in association with the agreement or by any other means, they can inform the American *Department of Commerce* of the breach and give them a timeframe in which to amend it. If compliance cannot be demonstrated by the end of the timeframe the agreement may be suspended. Then there is also the Annual Joint Review on the basis of which the Commission may suspend the agreement partially or fully.<sup>46</sup> Barring any incontestable irremediable instances of breaches, the Annual Joint Review is likely the method by which the Privacy Shield could be suspended in practice. This results in one period of the game being one year long.

### 4.2. The value of future gains

At first glance it is easy to believe that both the United States and the European Union will choose to comply when the game is infinitely repeating. Now their choices will have consequences for what the other does in the next period so they can learn to trust each other to comply based on earlier actions. However, there are two things to keep in mind.

First of all, there are several different strategies the players can use. How severe a punishment a player has to suffer from not cooperating depends on the strategy of the other player. With the relatively forgiving *tit-for-tat* strategy, the opponent can bring about renewed cooperation by complying for one round, whereas someone playing by the *grim strategy* never would return to cooperation.<sup>47</sup>

Second, a gain in the present is generally valued higher than a gain in the future.<sup>48</sup> If the payoff is measured in money, it can be invested today to increase in value by next year. For example, if the 120 utility points the United States gains by choosing to violate the agreement when the European Union complies (see table 1) corresponds to \$120 billion, it could in theory be invested for an annual return of, say, 5% and grow to \$126 billion by next year. Likewise, a payoff of 120 utility points a year later has a present value of what one needs to invest today to have 120 at the time of the later payoff. That is,  $120 / 1.05 \approx 114$ .

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<sup>46</sup>See "Commission Implementing Decision of 12.7.2016 pursuant to Directive 95/46/EC of the European Parliament and of the Council on the adequacy of the protection provided by the EU-U.S. Privacy Shield", (150)-(152).

<sup>47</sup>Cf. Downs and Jones 2002, pp. S104-S105; Cf. Dixit, Skeath, and Reiley, Jr. 2015, p. 381.

<sup>48</sup>Cf. Dixit, Skeath, and Reiley, Jr. 2015, p. 382; Guzman 2008, p. 37.

### 4.3. Tricking tit-for-tat

The tit-for-tat strategy means cooperating the first period and subsequently choosing whatever the other player chose in the preceding period. If the European Union plays by this strategy, will it be beneficial for the United States to defect for one round and then go back to cooperating?

This depends on what rate of return on investments  $r_{us}$  the United States can get. Using the payoff values from the last section, violating the agreement in the first round gives the United States 10 more utility points than if they had complied. Making up for it in the next period by complying while the European Union violates the agreement, however, results in a loss of 20 utility points compared to what they otherwise would have gotten. Since the loss lies one period into the future, its present value is  $-20 / (1 + r)$ . As long as the total utility from this alternating strategy is less than zero, it is rational to always comply. This is the case when:

$$10 - \frac{20}{1 + r_{us}} < 0 \Rightarrow r_{us} < 1.0$$

As long as there is no way to invest money at a rate of return higher than 100% it is rational for the United States to comply every period rather than alternate. Such a rate of return would be very difficult to find so compliance can be predicted. However, if what they could gain from a violation was a little higher, the alternating strategy would be the rational one. A calculation show that the limit lies at around a relative gain of 19 utility points, as opposed to the 10 utility points in the model.

### 4.4. Infinite violation or compliance

What if the European Union starts out giving the United States a chance to cooperate but punishes violation by never again cooperating? In this case the United States gets an initial payoff of 120 utility points but 100 in all future ones. Intuitely it might seem irrational to forgo the possibility of gaining 110 utility points each future period. However, at some rate of return it might be the most rational option.

Consider the example from subsection 4.2. If the payoff of 120 utility points lies two years into the future, the equivalent value today is  $120 / 1.05^2 \approx 109$ . If the payoff lies *three* years into the future, we divide by  $1.05^3$  and so on. This can be generalized to:

$$X = \frac{Y}{(1 + r)^n}$$

where  $X$  is the *present value* of the future payoff  $Y$ ,  $r$  is the rate of return per period of the game that a player is able to get on investments and  $n$  is how many periods into the future the payoff lies. Regardless of whether the players utilize the grim strategy or tit-for-tat they will continue to violate the agreement in all future periods if they start out doing it. Thus, the payoff for the United States would be:

$$100 + \frac{100}{1 + r_{us}} + \frac{100}{(1 + r_{us})^2} + \frac{100}{(1 + r_{us})^3} + \dots$$



Table 2: Payoff matrix for Privacy Shield

		United States	
		Comply	Violate
European Union	Comply	$(55R_{eu}, 110R_{us})$	$(-10 + 50R_{eu}, 20 + 100R_{us})$
	Violate	$(1 + 50R_{eu}, -10 + 100R_{us})$	$(50R_{eu}, 100R_{us})$

This sum is equal to<sup>49</sup>:

$$\frac{100(1 + r_{us})}{r_{us}}$$

In order to fit the values more neatly into the payoff matrix, Guzman's example will be followed by abbreviating the factor  $(1 + r_{us}) / r_{us}$  to  $R_{us}$ .<sup>50</sup> Then the above payoff for the United States when both players start out violating the agreement is  $100R_{us}$ . The payoff for the EU can be similarly calculated to be  $50R_{eu}$ . If the players decide to *comply* with the agreement from the start and continue to do so, we get a similar infinite sum to the one before, only with the numbers replaced accordingly.

When one player starts out complying while the other violates the agreement the situation becomes a little bit more complicated. Regardless of whether both players are using the grim strategy or tit-for-tat, what follows after the first period will be a series of only violations. The sum is then equivalent to the one where both choose to violate from the start but with the first term replaced with the one from the comply/violate scenario. So for example, if the United States starts out violating the agreement while the European Union complies with it their payoff will be the sum above but with 100 utility points subtracted and 120 added, which is the sum itself plus 20 utility points. The other payoffs in comply/violate scenarios are calculated in the same way. All payoffs can be seen in the payoff matrix in table 2, with the one calculated just now in the upper right corner.

Now the best choice for the parties will depend on what their  $R$  is. Will it be the best choice for the United States to violate the agreement in every period when the European Union is playing by either the grim strategy or by tit-for-tat? Their payoff if they do is  $20 + 100R_{us}$  and the payoff if they do not is  $110R_{us}$ . To maximize their payoff they should comply when:

$$110R_{us} > 20 + 100R_{us} \Rightarrow 10R_{us} > 20 \Rightarrow R_{us} > 2$$

This solves to a  $r_{us}$  of 1.0; that is, a rate of return of 100%. In other words, as in the preceding subsection, the United States should comply with Privacy Shield if they cannot find a way to double their money in one year. This gives an equally hopeful picture for the agreement since such a thing is virtually impossible. However, the rate of return can also be interpreted another way. To say that the present value of a future payoff of 2

<sup>49</sup>See proof in appendix A.

<sup>50</sup>Cf. Guzman 2008, p. 39.

utility points is 1 utility point can also be interpreted as the United States valuing future gains more, regardless of what they can get by for example lending money at interest.<sup>51</sup> It should be remembered that security was one of the factors that determined the United States' preferences. A rate of return of 100% would in the case of security mean that the United States was indifferent between having security increase in some measurable way today and having it double next year. This is of course very abstract. A concrete example could be the ability to stop one terrorist attack today or two terrorist attacks of equal gravity next year.

As was established in subsection 3.4, in the case of a United States playing by any strategy that complies in the face of compliance, the best choice for the European Union is to also always comply. This is true for both tit-for-tat and the grim strategy.

In the one-shot game, it was beneficial for the United States to violate the treaty even when the EU complied. It is not anymore. It is now costly for the United States to make the wrong prediction about what the European Union will do. The agreement thus survives when the European Union can make a credible threat of suspending it in the case of a violation.

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<sup>51</sup>Cf. Guzman 2008, p. 37.

## 5. Conclusion

The purpose of this essay has been to demonstrate how cooperation can be sustained among self-interested rational actors. The model is to some extent generalizable to other agreements and treaties than the one studied. However, more work would certainly be needed if anything is to be said about international law in general. For example, multi-lateral treaties with many more players might obey a different dynamic. Another part of the international legal system that would have to be handled separately is customary international law.

Only two possible strategies have been considered. There exist others that the players could use and which might be more beneficial to them. One such strategy is the Pavlov strategy, which contrary to tit-for-tat does not let the player return to compliance right after the opponent has done so.

Compliance each period from the United States seems to be the best possible strategy regardless of what of the two studied strategies the European Union uses. However, this requires them to believe the European threats of suspending the agreement if they are betrayed. Likewise, if the United States does not want the European Union to violate the agreement, they must credibly assure them that they themselves will comply. This is the simpler task since compliance is what benefits them the most.

Furthermore, it must be possible to know the actions of the other. The kind of mass surveillance that was revealed by Snowden could possibly take place again without the European Union knowing anything about it. Whether or not American companies give European data subjects the assured protection might be easier to screen for. As has been mentioned, there is a mechanism in place for reviewing compliance and an Ombudsperson that European data subjects can complain and enquire to.<sup>52</sup> This can be compared with the assertion from Regime Theory about transparency promoting compliance.<sup>53</sup> Other authors also recognize how different theories can give different important perspectives on international law.<sup>54</sup>

Readers might have expected the model to produce an “ultimate strategy” for each player to follow since both are rational actors. What hinders this is that despite knowing everything there is to know about the *rules* of the game, the players do not know what strategy the other player will be using. Furthermore, they do not know the  $r$ -value of the other player.

To enter into an agreement can be tantamount to putting one’s reputation on the line. The model predicts that given a belief in European cooperation and an  $r_{us}$  of less than 1.0, the best choice for the United States will be to comply. If they end up not complying, other countries will take notice and thereafter believe that  $r_{us}$  is greater than 1.0 making it harder for the United States to enter into future agreements. The United States would get a reputation for caring very little for the future and for being willing to betray the other party to the agreement in exchange for an immediate small gain.

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<sup>52</sup>See subsections 4.1 and 3.1.

<sup>53</sup>Cf. subsection 2.2.

<sup>54</sup>Cf. Guzman 2008, pp. 18–19; Koh 1997, p. 2649.

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## Cases

*C-362/14 Maximilian Schrems v Data Protection Commissioner EU:C:2015:650.*

## A. Mathematical proof for infinite sums

First of all, it should be recognized that the numerator  $Y$  can be broken out of the sum:

$$\sum_{n=0}^{\infty} \frac{Y}{(1+r)^n} = Y \left( 1 + \frac{1}{1+r} + \frac{1}{(1+r)^2} + \dots \right) = Y \cdot \sum_{n=0}^{\infty} \frac{1}{(1+r)^n}$$

then all that needs to be shown is that:

$$\sum_{n=0}^{\infty} \frac{1}{(1+r)^n} = \frac{1+r}{r}$$

This can be done by subtracting the sum divided by  $(1+r)$  from itself:

$$S - \frac{S}{1+r} = \left( 1 + \frac{1}{1+r} + \frac{1}{(1+r)^2} + \dots \right) - \left( \frac{1}{1+r} + \frac{1}{(1+r)^2} + \dots \right) = 1$$

which then can be solved for  $S$ :

$$\begin{aligned} S - \frac{S}{1+r} = 1 &\Leftrightarrow S - 1 = \frac{S}{1+r} \Leftrightarrow Sr - r + S - 1 = S \Leftrightarrow \\ &\Leftrightarrow Sr = 1 + r \Leftrightarrow S = \frac{1+r}{r} \end{aligned}$$

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