A Game Theoretic Analysis of the Relationship between Type of Government and Propensity to Peace and War

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Abstract

The object of this paper is to analyze the Kant / Tocqueville / Doyle hypothesis relating the type of government a state has and its propensity to use peace or war in its interactions with other states. For this, interactions among democratic, democratic with non-democratic, and non-democratic states are modeled as normal or matrix form games. Analysis of these games leads to the conclusion that peace is likely to prevail in continuous interactions involving only democratic or non-democratic states, but not in those among democracies with non-democracies. The paper concludes with some suggestions for refining the analysis and testing its conclusions.

1. Introduction

International relations analysts have paid a substantial amount of attention to the hypothesis that the type of government a state has influences its choice of peace or war in its relations with other states. Some observations are presented below with respect to the conceptual and statistical methods that have been used to study this hypothesis.

The conceptual analyses concentrate on the particular form of the hypothesis stating that democracies do not go to war with one another. Owen (1994:87) indicates that it “has become a truism” and quotes with approval several other theorists with similar opinions.

It is usually stated that this hypothesis was proposed by Kant in his essay on

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"Perpetual Peace" (Kant, 1795/1984 and 1795/1992). However, a detailed analysis of the essay, such as that presented by Smith (1992:1-105), and even critical evaluations of Kant's entire political philosophy such as that prepared by Reiss (1984:1-40), show that this view is not justified. Specifically, in "Perpetual Peace" Kant analyzes the possibility of peace based on a federation of free states. He considers it a necessary, but not sufficient, condition for these states to have democratic ("republican" in Kant's form of expression) governments that protect the rights and interests of minorities. However, his main point is that to achieve perpetual peace, the states should form a global federation that limits the sovereignty of each of its members.

Tocqueville (1990:349-352) addresses more specifically the propensity of democracies and aristocracies to war, but does not unequivocally indicate that democratic states do not go to war with each other. He, like Kant, believes that the populations of democratic states are likely to prefer peace. On the other hand, Tocqueville maintains that the armies of these states are likely to yearn for war. He does not indicate what he believes would be the final outcome of these conflicting points of view.

The current formulation of the hypothesis that democracies do not go to war with each other is due to Doyle (1983a, 1983b, 1986 and 1993:173-203). It has received mostly favorable evaluations by numerous international relations analysts. A selection of relevant papers on this topic is presented by Linklater (2000:833-1089).

In addition to the conceptual analysis outlined above, numerous authors have used statistical methods to test the hypothesis that type of government influences the propensity for peace and war. Cohen (1994:208-210) presents a brief review and evaluation of these analyses. For the purposes of this paper is should be observed that these studies, in response to requirements of the statistical methods used, consider the relationships among not only democratic but also non-democratic types of government and their propensity for peace and war. This more general formulation of the hypothesis is used below as a term of reference.

The point of departure of this paper is that the generalized hypothesis clearly refers to relationships among states. From this observation, and from the definition of game theory as the study of interactions among rational and, in some cases, non-rational actors, it follows that a game theoretic analysis of the hypothesis could help to evaluate its theoretical basis. The objective of this paper is to take some steps in this direction.

The following Section includes a more detailed presentation of the

generalized hypothesis using ideas of Tocqueville, Doyle and Kant as points of departure. This is used in Section 3 to analyze three possible cases: interactions between two democracies, between a democracy and a non-democracy, and finally, between two non-democracies. Section 4 includes some conclusions and suggestions for future research.

2. An overview of the hypothesis on the relationship between form of government and propensity to peace and war

No attempt will be made here to identify all the different types of government. It will simply be assumed that governments can be classified as democratic and non-democratic. Despite this simplification of a rather large field of study, it is still difficult to characterize these two types of government. For instance, Cohen (1994:1004-08) calls attention to the difficulty or impossibility of developing a generally acceptable definition of democracy. By default, his analysis can be extended to the impossibility of defining non-democratic governments. No attempt will be made here to solve this problem.

In the presentation below it is simply assumed that a democratic state is characterized, first, by the ability of its population to influence governmental decisions in such a way that its preferences are taken into consideration, and second, by the availability of alternative and free sources of information. Tocqueville (1990:27-28 and 92-96) also considers these two characteristics as the foundation of a democracy, and according to Reiss (1984, pp. 26 and 32), this is also Kant's point of view. These two authors emphasize that the preferences of all the population of a state, and not only of a majority within the population, should be taken into consideration. They call attention to the fact that governments based on a majority may lead to tyrannies, but they do not suggest any solution for this problem. It is beyond the scope of this paper to analyze it and propose ways to solve it.

The characteristics of democracy mentioned above imply that the population of a state with this type of government is able to form well-informed opinions about the alternatives available, and, once this is done, to influence the government to move toward the conditions it prefers. In the case being analyzed, this implies that the preferences of the population about peace and war will be reflected in the actions that the government takes with respect to these possibilities.

It is generally accepted that war has catastrophic consequences for the

populations of states involved in a conflict. For instance, Kant (1795/1984:100) indicates that the miseries of war for citizens include "doing the fighting themselves, supplying the costs of the war from their own resources, painfully making good the ensuing devastation, and, as a crowning evil, having to take upon themselves a burden of debt...." Tocqueville (1990:350) emphasizes the love of the population for peace rather than the miseries that war brings to it. Despite the intuitive appeal of these and similar statements, they cannot be accepted without an important qualification. The miseries of war, in particular, would affect the populations of all the states involved in a conflict, as long as all of them have similar capabilities to damage each other; that is, as long as there is some balance of power among them. Otherwise, the miseries of war for the more powerful states are likely to decrease as the difference in their power over their enemies increases. On the other hand, less powerful states involved in a conflict suffer greater damages than their enemies. In the presentation below, only states with similar economic and military power will be considered. The analysis of form of government and propensity for peace and war for states with different power levels is left for future research.

For the purposes of this paper, non-democratic states can simply be considered as the opposites of their democratic counterparts. Basically, the population of this type of state, due to lack of information and / or power, is unable to lead it toward the achievement of the conditions it prefers. This definition is similar to that presented by Kant (1795/1984:101) for what he calls "despotic" states, and by Tocqueville (1990:120) for states under the control of an aristocracy.

This definition is seriously limited in that it does not indicate the basis for decisions or the orientations that non-democratic states may take. Here it is assumed that non-democratic states are ruled by oligarchies that base their power on the monopolistic control of economic resources and/or the might of armed forces. The affairs of the state are conducted in a way that benefits the oligarchy, rather than the general population.

These observations still do not explain why non-democratic states may give war a higher ranking than that assigned to it by their own populations and by democratic states. Kant (1795/1984:100) indicates only that the oligarchies of non-democratic states do not pay the financial and non-financial costs of a war. However, this is not sufficient for the purposes of this paper. The main reason for this is that Kant does not indicate the motivations that oligarchic governments may have for entering into a war. In addition, Kant's opinion also in this case is

valid only when there is a balance of power among all the states involved in a war. Without this balance, even the oligarchies of the weaker states are likely to pay dearly for it.

In the presentation below it is assumed that the incentive that oligarchic governments have to enter into a conflict is that they can use wars to increase their wealth and power by increasing their control of economic resources within the state and the might of the armed forces under their command. Most of these are net benefits, since the general population covers the costs of wars.

This assumption about the motivation for war of non-democratic governments is somewhat controversial. For instance, according to Tocqueville (1990:350) aristocracies are likely to have a lower propensity to war because they already have most of the benefits that it could bring to them. Thus the assumption to be used here about the motivation of oligarchies cannot be accepted without some empirical verification. The realization that there is a need for this assumption and for its empirical verification can be considered as a benefit of the analysis being presented. These two topics will not be covered here.

The observations above are used in Section 3 to specify reasonable but hypothetical payoffs that states may receive when they interact. These payoffs provide a required element to study these interactions, using the methods of the theory of games.

3. Some game theoretic models for the analysis of the relationship between type of government and propensity to peace and war

3.1. Introduction

From the presentation above it follows that a complete analysis of the relationship between forms of government and propensity to peace and war can be made only if the interactions among democracies, among them and non-democracies, and finally, among non-democracies are considered. These three possibilities are covered in this Section, but not in their most general form. Specifically, no attention will be paid to interactions among large numbers of states. Only cases in which two actors, to be denoted with “A” and “B”, are involved are studied below, and it is assumed that they have similar economic and military power.

In addition, peace and war are not precisely defined events. There are some intermediate positions between the two extremes of complete peace and all-out

war. Despite this, and without attempting to clarify the issues involved, it is assumed below that the states involved can only choose between the two well-defined strategies of peace and war.

Finally, it is assumed that the states involved have only four rankings for their preferences of the outcomes of their interactions. These rankings will be denoted with B (Best) for the most preferred outcome, S (Second) for the outcome with the following level of preference, T (Third) for the next, and W (Worst) for the least preferred outcome.

3.2. Analysis of the peace / war interactions between 2 democracies

A normal or matrix form game representing an isolated interaction between 2 democratic states with equal power is presented in Table 1. This Table is analyzed in this Section.

Table 1

An isolated interaction between two democratic states with equal power formulated as a game in normal or matrix form

		State "B"	
		Peace	War
State "A"	Peace	(B,B)	(W,S)
	War	(S,W)	(T,T)

Table 1 indicates that state "A" chooses between the two rows in front of it, and state "B" between the two columns under it. The payoffs for "A" and "B" are indicated by the pairs of letters in parenthesis in the main body of the Table. The first letter of each pair indicates the payoff for "A", and the second that for "B". The letters themselves indicate the ranking that each state assigns to the outcome obtained with the choice of strategies at the heads of the corresponding row and column.

The rankings of the preferences of the two states in Table 1 are derived from the assumptions in Section 2. In agreement with them, a reasonable first approximation is that peace is the most preferred alternative for "A" and "B". It is more difficult to assign rankings when one state chooses peace and the other war. Basically, this can be interpreted to mean that the state choosing peace simply

surrenders to that choosing war. From this point of view it follows that the state choosing peace will accept whatever the state choosing war imposes, while the latter receives all the benefits without any costs. For these reasons, it is assumed in Table 1 that the combination (Peace, War) or (War, Peace) will be the least preferred for the state choosing peace, but the second most preferred for that choosing war. Some observations on the consequences of modifying this assumption will be presented later. Finally, it also seems reasonable to assume that the third ranking is assigned by the democratic states to the case where both of them choose war.

To specify the equilibrium choices of the interacting states, it should be observed that the vertical arrows indicate that "A" prefers peace when "B" prefers peace, and war when "B" prefers war. State "B" has equivalent, or more precisely, symmetric responses to "A"'s choices. From this it follows that both (peace, peace) or (war, war) are equilibrium strategies. Since both "A" and "B" prefer peace, it is likely that this would be the final outcome of the interaction between the two states. In this framework, it can be said that the hypothesis that democratic states do not go to war with each other is supported.

The analysis above clearly shows that there is no reason to assume that the two states would change their behavior if they interact several times. In each case, they would tend to solve their difference peacefully. This can be interpreted to mean that democracy is likely to lead to perpetual peace.

Unfortunately, the conclusion above is restricted to the case in which the preferences of the two interacting states are those presented in Table 1. However, as mentioned above, it may be reasonable to challenge the assumption that the most preferred alternative for both states is peace. The most preferred alternative for a country could be to choose war when its counterpart chooses peace. As previously indicated, this would mean that the state choosing war would receive substantial benefits without any cost.

The counterpart of Table 1 for this case will not be presented here. It can be easily verified that such a table would show that the relations between two democratic states can be characterized as a prisoners' dilemma game. This means that the two countries being considered will choose war on any occasion in which they have an isolated interaction. This is true despite that peace will generate better payoffs for both of them.

This counter-intuitive conclusion of the prisoners' dilemma model has been a major concern among game theorists since the game was introduced in 1950. So far no satisfactory solution for the case of an isolated interaction has been found.

However, as shown, for instance by Straffin (1993, pp. 73-79) and Thomas (1986, pp. 129-146) there are two ways to deal with this problem that are particularly meaningful for the topic being considered here.

In the first approach, the assumption that the actors have only one isolated interaction is simply replaced by the assumption that they have a series of interactions and that they cannot anticipate with certainty if and when these interactions will end. In this case it can be proved that if the probability that there will be one additional interaction following the one currently taking place is sufficiently large, states "A" and "B", will benefit if they choose peace. The minimum value that the probability of continuation can take is determined by the values that the actors assign to the payoffs B, S, T and W. In particular, even a small value of this probability is sufficient when the difference between B and S is small in relation to that between B and T. Under these conditions a state does not have much to win if it chooses war and can benefit from additional peaceful interactions in the future.

In the second or metagame approach, it is assumed that the actors are able to anticipate the strategies that each is likely to adopt and that the information needed for this can be obtained if they communicate with each other. In this case it is shown that if each state has complete and reliable information about the intended behavior of its counterpart, it is beneficial for it to adopt a peaceful strategy. This result is interesting, because in most cases states are involved in diplomatic interactions and mutual espionage that give them the opportunity to discover the forms of behavior that their counterparts are likely to adopt. This means that a weaker but practical form of the conditions assumed in the formal analysis of metagames may actually be realized. As a consequence, there is a possibility that the interacting states would choose peace without risking the damages that a prisoners' dilemma condition indicates would fall upon them if they do not choose war.

The observations above lead to the conclusion that even with the modification of the payoffs presented in Table 1, peace may be the outcome of the interactions among democratic states. Once more it can be said that the analysis being presented supports the hypothesis that democracies are not likely to fight each other.

3.3. Analysis of the peace/war interactions between a democratic and a non-democratic state

The game theoretic formulation of an isolated interaction between a democratic state "A" and a non-democratic state "B" when both have similar economic and military power, is presented in Table 2.

Table 2

An isolated interaction between a democratic and a non-democratic state formulated as a game in normal or matrix form

		Non-democratic State "B"	
		Peace	War
Democratic State "A"	Peace	(B,T) ⇐	(W,B) ⇓
	War	(S,W) ⇑	⇒ (T,S)

As before, the payoffs for the interacting states are derived from the assumptions presented in Section 2. The payoffs for the democratic state "A" are those presented in Table 1 and will not be analyzed again. It seems reasonable to assume that the most preferred choice of non-democratic state "B" is war when its counterpart chooses peace. It should be recalled that, even in the case of the interactions of democratic states considered in Section 3-2, this assumption is an appealing possibility. These observations also justify the assumption that war is the second best alternative for the democratic state "A" when "B" chooses peace. Considering that the oligarchies of the non-democratic state "B" benefit from war, it is reasonable to assume that this state gives its third ranking to peace when "A" chooses peace. Finally, it is assumed that "B" assigns its second highest ranking to war when "A" chooses war.

Table 2 shows that under the conditions described, "A" would make the same choices as it did in the case considered in Table 1. This means that "A" would choose peace if "B" chooses peace, and war if "B" chooses war. On the other hand, "B" would choose war regardless of "A"'s choice. As a consequence, the equilibrium of the game is that the two states choose war. In other terms, democracy does not reduce the risk of war when democratic and non-democratic states interact. In addition, the choice of (Peace, Peace) would benefit only "A". Thus there is no reason for the result above to change even if repeated interactions take place. It

will be shown in Section 4 that this conclusion has important implications for the generalized hypothesis being studied.

3.4. Analysis of the peace/war interactions between two non-democratic states

The game theoretic formulation of the interactions between two non-democratic states with similar economic and military power is presented in Table 3. As before, the basis for this Table is the characterization of this type of state presented in Section 2. The preferences assumed are quite similar to those used in Table 2, and will not be discussed again. However, it is useful to observe that if the preferences of non-democratic states in Table 3 are made identical to those for these states in Table 2, none of the analyses and conclusions presented below would change.

Table 3

An isolated interaction between two non-democratic states with equal power formulated as a game in normal or matrix form

		State "B"	
		Peace	War
State "A"	Peace	(S,S) ⇐	(W,B) ⇓
	War	(B,S) ⇒	(T,T)

Table 3 shows that each non-democratic state would choose war, regardless of what its counterpart does. Their interaction takes the form of a prisoners' dilemma, and the conclusion is that the equilibrium choice is (War, War). In practice, this means that non-democratic states would frequently be at war with each other, despite that the choice of the peace strategy would give them a preferred outcome. This conclusion, on the one hand, agrees with the hypothesis that democratic states rank peace much higher than those who have non-democratic governments. However, it should be observed that the results from the theory of games mentioned in Section 3-2 with respect to the effects of repetitions of a prisoners' dilemma and to its analysis as a metagame also apply in this case. Thus non-democratic states that interact frequently or that have reliable information about each other may reach a form of cooperation in which war seldom takes place. This means that democratic and non-democratic states are likely to behave similarly.

4. Conclusions and suggestions for future research

An overall evaluation of the analyses presented here gives the first impression that they support the hypothesis that democracies do not fight wars among themselves, and that, on the other hand, in interactions involving non-democratic states, war is more likely. These conclusions are supported by most statistical analyses of this type of problems. However, a careful of the analyses and results in this paper suggests that these conclusions do not have a particularly strong basis. Some of the reasons for this are presented below.

First, the only clear-cut conclusion that democracies do not fight among themselves is valid, as shown in Section 3-2, only when special assumptions are made with respect to their preferences with respect to peace and war. A relatively small change in these assumptions leads to a prisoners' dilemma, and the conclusion that only when there are repeated interactions among these states, or interactions under special conditions, is the conclusion supporting non-belligerency maintained. However, under the same special conditions, non-democratic states would also prefer peace to war. In summary, the support for the hypothesis favoring only democracies is, at best, rather weak.

On the other hand, the analysis in Section 3-3 leads to the conclusion that war is more likely between democratic and non-democratic states than in either of the 2 other cases considered. This suggests that it is the difference in the types of government that influences the propensity to war, rather than the type of government itself. More specifically, the main conclusion from the analyses here is that if all the states are democratic or non-democratic, peace is likely to prevail. The possibility of war increases only when some states have democratic and others non-democratic governments. Democracy, when the preferences of all the citizens and not only those of the majority, are taken into consideration in the government's decisions, is better than oligarchy. However, this is not because only democratic states have a lower propensity for war when interacting among them selves. The analysis in this paper suggests that non-democratic states would also choose peace when involved in interactions with the same type of government. It should be observed that although the statistical analysis of this conclusion is particularly important, it is left for future research.

The observations above refer only to the conclusions obtained with the analyses presented here, without considering any of the limitations of the analyses themselves. A first point that has to be raised in this respect deals with the basis used to specify the preferences and payoffs of the two types of states

considered. Both the characterizations of democratic and non-democratic states and the specifications of their preferences and payoffs should be carefully scrutinized. The need for this is likely to be one of the most important and non-disputable conclusions of this paper.

Despite the limitations of the analysis and conclusions reached, it seems reasonable to state that the method used, like any other application of game theory to the study of international relations topics, at least helps to clarify some of the most basic problems that humanity has to face.

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