

# Electoral Incentives, Term Limits, and the Sustainability of Peace

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## Abstract

One of the few stylized facts in international relations is that democracies, unlike autocracies, almost never fight each other. Recent empirical findings show that binding term limits invalidate this result: democratic dyads in which at least one country imposes term limits on the executive are as conflict prone as autocratic and mixed dyads. Moreover, in democracies with two-term limits conflicts are more likely during the executive's second term. To rationalize these findings, we model international relations as a repeated prisoners' dilemma. We show that the fear of losing office makes democratic leaders less willing to start costly conflicts. Crucially, this discipline effect can only be at work if incumbent leaders can run for re-election. Term limits thus make it harder to sustain peaceful relations.

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# 1 Introduction

It has long been argued that periodic elections are the main channel through which voters can keep politicians in check in representative democracies (Barro, 1973). The desire to retain office can constrain the opportunistic behavior of incumbents and allow voters to retain able politicians. However, politicians often face restrictions on the number of terms they can serve. For example, many countries allow their executives to be re-elected only once (e.g. the United States since 1951) or rule out re-election altogether (e.g. Mexico since 1917).

In a recent empirical study, we show that executive term limits can crucially affect the probability that democracies engage in military conflicts (Conconi *et al.*, 2014). In the absence of term limits, democracies are less likely to fight one another than autocracies or mixed dyads (country pairs made by a democracy and an autocracy). This result is in line with the vast literature on the so-called “democratic peace”. However, democratic pairs of countries in which at least one of the leaders is subject to binding term limits are as conflict prone as autocratic and mixed dyads. The type of term limits also matters: in democracies pairs in which the leaders face two-term limits, conflicts are less likely to arise in the first mandate — when re-election is still possible — than in the second mandate — when the executive is a “lame duck”.

Various theoretical models have been put forward to explain the democratic peace phenomenon. Some focus on the role of communication and trust: democratic institutions can help to reveal information about the government’s political incentives in a crisis by improving its ability to send credible signals (e.g. Fearon, 1994; Schultz, 1998; Levy and Razin, 2004). Jackson and Morelli (2007) develop a model in which dictatorships are more likely to be at war with each other because the preferences of their leaders are more “biased”, i.e. different from those of the population at large. These models do not directly focus on the role of re-election motives (or lack thereof), and thus cannot provide an explanation for the empirical results on the impact of term limits.

In this paper, we describe a theoretical model that provides a rationale for both the democratic peace and the impact of terms limits on interstate conflicts. We formalize an idea first put forward by Emmanuel Kant [1795]. In his essay on “Perpetual Peace”, he argued that leaders who are accountable to the people are less prone to break peaceful relations: if the people who have to pay for it with their lives and possessions decided whether or not there should be a conflict, they “would be very cautious in commencing such a poor game, decreeing for themselves all the calamities of war” (p. 13). Our model shows that re-election motives are crucial to sustain peace. By limiting — or eliminating altogether — electoral accountability, executive term limits can make it more tempting for democratic leaders to engage in costly conflicts.

We describe security relations as a repeated prisoners’ dilemma game between two countries. This setup reflects the fact that the use of military force is often beneficial in the short-run, but tends to have long-term detrimental consequences: each country is tempted to attack the other to obtain a portion of its wealth and resources; however, if both countries use force, the resulting military conflict is costly compared to being at peace. In the absence of a supranational authority with direct powers to punish violations, peace can only be sustained through repeated interaction:

governments will only refrain from aggressive military behavior if they perceive that doing so is in their long-term interest.

A key feature of our model is that peace is a *dyadic* phenomenon: it “takes two” to sustain it. Even if one of the leaders has no incentive to start a conflict, he will use military force when faced with another leader with belligerent incentives. It is thus enough for one leader to be tempted to break peace for a conflict to arise.

We first examine the sustainability of peace between democracies and autocracies. The crucial difference between the two forms of governments is that in democracies, unlike in autocracies, policymakers are subject to periodic elections. In this setup, we derive results about the likelihood of conflict in different dyads (two autocracies, two democracies, and a mixed dyad). Our model provides a simple explanation of the democratic peace based on electoral accountability: if the payoffs from future terms in office are sufficiently large, the threat of losing office can reduce politicians’ willingness to break peaceful relations with other countries. Our model can also explain why democracies rarely fight each other, but often fight with autocracies.

We then study the impact of executive term limits, which restrict the number of mandates that a democratic leader can serve in office. Our model suggests that term limits hinder peace, since they reduce — and can even eliminate, in the case of binding term limits — the incumbent’s payoffs from future periods in office; in turn, this reduces voters’ ability to punish leaders who engage in costly military conflicts. In particular, in line with recent empirical findings, our analysis generates two distinct results. First, democracies whose leaders face binding term limits should be as likely to be involved in military conflicts as autocracies. Second, for democracies that impose two-term limits on their executives, the likelihood of being involved in a military conflict should be lower in the first than in the second term.

Our paper is related to three main streams of literature. First, our theoretical model builds on the literature on self-enforcing international agreements, which examines how cooperative behavior among policymakers of different countries can be sustained by credible threats when they engage in long-term relationships (e.g. Dixit, 1987; Bagwell and Staiger, 1999; Ederington, 2001). In previous studies, policymakers and their countries are modeled as one and the same. We depart from these studies, by considering a setting in which policymakers’ objectives are allowed to differ from those of their countries.

Second, our paper contributes to the literature on interstate conflicts. One of the few stylized facts in this literature is that democracies are much less likely to fight one another than autocracies or mixed pairs of states. This has been described as an “empirical law” in international relations. However, the “consensus that democracies rarely if ever fight each other is not matched by an agreement as to how best to explain this strong empirical regularity” (Levy, 2002). Existing theoretical explanations for the democratic peace can be divided into two broad approaches: normative and institutional explanations. The normative approach contends that democracies are less conflict prone toward one another because they share similar norms of compromise and cooperation (e.g. Maoz and Russett, 1993; Dixon, 1994; Dixon and Senese, 2002). In essence, these norms mandate

nonviolent conflict resolution and negotiation. Because democratic leaders are committed to these norms they try to adopt them in the international arena rather than resorting to violence. To explain conflicts between democracies and non-democracies, this literature argues that democratic values are applied only when democracies face other democracies and are abandoned otherwise. Our paper belongs to the literature on institutional explanations of the democratic peace, which argues that democracies are peaceful toward one another because of the limits placed upon leaders by government institutions. Leading theoretical models belonging to this approach include Bueno de Mesquita *et al.* (1999), Fearon (1994 and 1997), Levy and Razin (2004), and Jackson and Morelli (2007). As mentioned before, these models do not consider the role of elections and term limits. On the empirical front, beyond Conconi *et al.* (2014), other studies provide support for the Kantian idea that the public acts as a restraint on war. Gaubatz (1991) finds that democracies start conflicts early in the electoral cycle, suggesting that approaching elections discipline democratic leaders. More recent studies reviewed in Bueno de Mesquita (2006) examine how the use of force affects the likelihood that a leader remains in office and find that “defeat in war, for instance, is costly for society and therefore for accountable democratic leaders more so than for nonaccountable autocrats, monarchs, or junta leaders” (p. 640). Zeigler *et al.* (2013) study militarized disputes in a sample of forty-eight democracies with term limits between 1976 and 2000. They show that leaders who face binding term limits are more likely to initiate conflicts than those who can still be re-elected.<sup>1</sup>

Finally, our paper is related to the literature on terms limits. The above-mentioned political agency literature originated with Barro (1973) and stresses the positive role of electoral accountability and the detrimental effects of term limits.<sup>2</sup> According to this view, term limits reduce — or, in the case of binding term limits, completely eliminate — the incumbent’s payoffs from future periods in office, thus limiting voters’ ability to punish opportunistic behavior by threatening to replace the incumbent with a challenger. They also prevent voters from retaining able politicians. A second stream of the literature, mostly focused on restrictions faced by legislators rather than executives, emphasizes the potential beneficial effects of term limits.<sup>3</sup> The literature on term limits is mostly focused on the impact of how electoral accountability (or lack thereof) on domestic policies, without considering their effects on the strategic interaction between countries. A notable excep-

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<sup>1</sup>A related study by Haynes (2012) shows that “lame-duck” presidents, who are constitutionally prohibited from re-election, are systematically less effective than their re-electable counterparts in crisis-bargaining situations.

<sup>2</sup>Important contributions in this literature include Banks and Sundaram (1998), Besley and Case (1995), Besley and Burgess (2002), List and Sturm (2006), and Alt *et al.* (2011).

<sup>3</sup>Dick and Lott (1993) argue that voters have incentives to re-elect their representative given that seniority brings bargaining power in Congress. This leads to a bias toward re-electing inefficient incumbents and also gives bad incentives to politicians. By reducing the seniority effect, term limits can be beneficial. Glazer and Wattenberg (1996) argue that term limits shift politicians’ incentives away from the pork barrel legislation that brings electoral success. Glaeser (1997) describes a model in which a right-wing and a left-wing party have an equal probability of winning the first election. An exogenous incumbency advantage ensures that the party which wins the first election is also re-elected for further terms in office. In this setting, term limits may be self-imposed by risk-averse voters. Smart and Sturm (2013) show that, despite the disciplining effect of elections, term limits can be ex-ante welfare improving: by reducing the value of holding office, they can induce politicians to implement policies that are closer to their private preferences, which in turn results in better screening of incumbents.

tion is the paper by Conconi and Sahuguet (2009), who examine the impact of electoral incentives on international cooperation. The focus of their analysis is not on peace and military conflicts, but rather on the sustainability of international agreements (e.g. trade and environmental agreements). More importantly, their analysis cannot explain the empirical findings about the detrimental effects of term limits.<sup>4</sup>

The rest of the paper is organized as follows. The next section describes the model setup. Section 3 examines the sustainability of peace in autocratic, democratic, and mixed dyads. Section 4 considers the impact of term limits. We offer some concluding comments in Section 5.

## 2 Model setup

The main purpose of the theoretical model described in this paper is to provide a rationale for the empirical findings on the role of executive term limits on interstate conflicts. In Conconi *et al.*, (2014), we studied the impact of different types of executive term limits on the likelihood of military conflicts, focusing on a sample of 177 countries since 1816. The main findings of can be summarized as follows:

1. Democratic dyads in which the leaders can be re-elected are less likely to fight each other than autocratic dyads or mixed dyads.
2. Democracies in which at least one of the leaders faces binding term limits are as conflict prone as autocratic dyads or mixed dyads.
3. Democracies in which at least one of the leaders faces two-term limits are more likely to be involved in conflicts during the executive's last term.

In what follows, we describe the key features of our theoretical model of interstate conflicts. We model international security relations as a repeated prisoners' dilemma game between two countries, 1 and 2. Attacking another country is tempting as it can lead to obtain a portion of its wealth and resources. However, once the attacked country reacts by defending itself, the military conflict that ensues is costly for both countries compared to a situation of peace. Importantly, the actual decision-makers are not the countries themselves, but their leaders, who are driven by different objectives. We first describe the countries' actions and payoffs and then move on to the leaders' objectives and the political process.

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<sup>4</sup>Conconi and Sahuguet (2009) actually stress the *positive* role of term limits. They show that, if country leaders have staggered mandates and their re-election chances depend significantly on their recent performance, they will have incentives to "collude" to get re-elected, at the expense of efficient cooperation between their countries. If this is the case, term limits may help to achieve more international cooperation. Moreover, their model only considers the effects of one-term limits, and thus cannot explain within-dyad differences in the probability of conflicts between democracies in which the executives face two-term limits.

## 2.1 Countries' actions and payoffs

As in any standard prisoners' dilemma game, a country chooses between two strategies: either cooperate ( $C$ ), i.e. not using military force against the other country, or defect ( $D$ ), i.e. deploying military force. Conflicts are driven by the desire to appropriate a portion of the other country's wealth. This should be interpreted broadly, to include not only territory, but also other resources (e.g. oil, raw materials), or even political concessions. In particular, we assume the following: each country  $i$  has wealth of  $W_i$ ; independently of the outcome of the conflict, waging a war costs a country a fraction  $K > 0$  of its wealth; a country's probability of winning depends on the military strength it deploys relatively to that of its opponent; if a country wins the war, it gains a fraction  $G > 0$  of the other country's wealth. The parameter  $G$  captures the extent of the spoils obtained from attacking the other country,<sup>5</sup> while the parameter  $K$  captures the extent of the military costs, including the loss of lives and the military expenses occurred during a conflict.<sup>6</sup>

In a peaceful situation (when both countries play  $C$ ), each country  $i$  keeps all its wealth, without wasting any resources on deploying military force, achieving a payoff of  $\Pi_i^C = W_i$ . If country  $i$  breaks peace, playing  $D$  while country  $j$  plays  $C$ , the attacking country obtains a payoff equal to  $\Pi_i^D = (1 - K)W_i + GW_j$ , while the other country gets  $\Pi_j^P = (1 - G)W_j$ . In a war situation (in which both countries play  $D$ ), a country wins a fraction  $G$  of the other country's resources with a probability that increases in its military strength and decreases in the other country's military strength. If the two countries deploy the same military strength, none of them wins the war.<sup>7</sup>

Table 1: Prisoners' dilemma (countries' payoffs)

		1	
		C	D
2	C	$\Pi^C = W$	$\Pi^D = (1 - K + G)W$
	D	$\Pi^D = (1 - K + G)W$	$\Pi^N = (1 - K)W$

<sup>5</sup>Jervis (1978) argues that the extent of the "gains from exploitation" may depend on the availability of raw materials and whether or not the occupied territories are inhabited by people of the same ethnic groups.

<sup>6</sup>For example, according to the Combat Area Casualty File (CACF), during the Vietnam war more than 58,000 Americans were killed, more than 300,000 wounded, and almost 14,000 completely disabled. Moreover, according to the U.S. Veteran's Administration, up to 800,000 Vietnam veterans have been diagnosed as having "significant" to "severe" problems of readjustment. The total cost of the war amounted to hundreds of billions of dollars and these costs will continue for decades in the form of veterans' benefits (see [www.va.gov](http://www.va.gov)).

<sup>7</sup>Our setup presents some similarities with that described by Jackson and Morelli (2007), in which conflicts are also driven by appropriation motives. Crucially, Jackson and Morelli (2007) rule out the possibility of costly stalemates, assuming that wars are always desirable for one of the two countries involved. We allow instead for the possibility that, when two countries of similar military strength face each other, they simply end up wasting part of their wealth in the conflict, without gaining resources from the other country (i.e.  $\Pi_i^N = (1 - K)W_i$ ). In our setting, being involved in a military conflict can thus be costly for both countries compared to being at peace.

We are interested in examining how domestic political institutions—rather than countries’ relative power—affect the likelihood of conflict. We thus focus on two countries that have the same initial wealth and access to the same technology. In this symmetric setup, countries’ payoffs are given in Table 1. Assuming  $G > K$ , each country is tempted to attack the other to obtain a portion of its wealth and resources; however, both countries find it desirable to be at peace rather than being involved in a war, in which they waste a fraction  $K$  of their wealth, without gaining any of the other country’s resources. This implies that the following inequalities hold:  $\Pi^D > \Pi^C > \Pi^N > \Pi^P$ .

The prisoners’ dilemma described above constitutes the stage game, which is repeated indefinitely. We denote the current period by  $t$ , ( $t = 0, 1, 2, \dots, \infty$ ) and the actions taken at period  $t$  by  $a^t = (a_1^t, a_2^t)$ , where  $a_i^t \in A = \{C, D\}$ . The payoffs to country  $i$  are the stage payoffs of the stage game and are denoted  $\Pi_i^t(a_i^t, a_{-i}^t)$ , where  $a_{-i}^t$  refers to the action taken at time  $t$  by the other country. We assume the payoffs are the same for each country and are time invariant. The payoffs are summarized by the vector  $\Pi = (\Pi^D, \Pi^C, \Pi^N, \Pi^P)$  defined above.

## 2.2 Leaders’ objectives

The main novelty of the model compared to a standard repeated prisoners’ dilemma is that the actual players are the active leaders of the countries rather than the countries themselves.<sup>8</sup> To focus on the role of electoral accountability, we make two main assumptions on the preferences of the leaders. First, we assume that, independently of the political regime, the utility of a leader depends on whether or not he is in power and on the actions played in the security dilemma game. This means that in the absence of any institutional constraint, democratic leaders have the same preferences as autocratic leaders and would be as conflict prone.

Second, we assume that leaders have preferences that differ from those of their citizens. Politicians are office motivated and derive “ego rents” equal to  $Z$  while in power. To capture Kant’s idea that politicians need to be “disciplined” because they do not fully internalize the costs of military conflicts, we also assume that — whether or not they are in power — leaders only take into account a fraction  $\alpha$  of the total costs incurred by their country when deploying military force. From their point of view, the payoffs of the stage game are thus different from those of Table 1, and are given by  $\pi^D = (1 - \alpha K + G)W > \pi^C = W > \pi^N = (1 - \alpha K)W > \pi^P = (1 - G)W$ . Country leaders are thus “biased” in their evaluation of the consequences of the use of force, and citizens want to discipline them toward more peaceful behavior. For simplicity—and in line with Kant’s original argument—we model the gap between the leaders’ preferences and those of the citizens as arising solely from differences in the costs of conflicts. It would be straightforward to allow also for differences in the benefits, by assuming that politicians get a larger share of the gains from attacking another country.

To incorporate the fact that countries are run by leaders whose identity may change overtime,

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<sup>8</sup>Our analysis presents some similarities with the existing literature on repeated games between overlapping generations of players, which has examined the sustainability of cooperation between organizations run by agents with finite but overlapping tenures (e.g. Crémer, 1986; Salant, 1991; Kandori, 1992; Smith, 1992). Compared to this literature, we allow for agents’ re-election; the life span of the leader is thus *endogenously-determined* rather than exogenously fixed.

we assume that in each country there is a pool  $L$  of identical leaders. We denote by  $l_i^t$  the identity of the leader of country  $i$  at time  $t$ , with  $l_i \in L_i = \{1, 2, 3, \dots\}$ . The payoff of politician  $k$  in country  $i$  can then be written as

$$U_{i,k} = \sum_{t=0}^{\infty} \delta^t I_t(k) Z + \sum_{t=0}^{\infty} \delta^t \pi_i^t (a_i^t, a_{-i}^t) \quad (1)$$

where  $\delta \in (0, 1)$  is the common factor by which country leaders discount future payoffs and  $I_t(k)$  is an indicator variable which is equal to 1 when politician  $k$  is in power and to 0 otherwise.

### 2.3 Political regimes

We introduce a recursive process that describes which leader is in power in a given country at any point in time. We denote by  $e^t = (e_1^t, e_2^t)$  the results of this process at time  $t$ . The result  $e_i^t = 0$  corresponds to a situation in which the identity of the leader in power in country  $i$  at time  $t$  does not change. This could be the case either because there is no election in that period, or because the incumbent is re-elected. The result  $e_i^t = 1$  corresponds instead to situations in which there is an election and the incumbent leader  $l_i^t$  loses office and is replaced by  $l_i^t + 1$ . In democracies, changes in the identity of the leaders result from an electoral process. We do not explicitly model voters as players of the game; however, we describe a voting process that implicitly reflects their interests and is allowed to depend on the history of the game.

Let us denote with  $h^t = (a^0, a^1, a^2, \dots, a^t; e^0, e^1, e^2, \dots, e^t)$  the history of the game up to time  $t$ . The space of all possible histories at time  $t$  is given by  $H^t$  and the space of all histories is  $H = \cup_{t \geq 1} H^t$ . For each possible history up to time  $t$  and given the actions in that period, the incumbent stays in power if  $e_i^t = 0$ . The function  $p$  captures a leader's probability of retaining office, depending on the actions played and the political regime.

#### Autocracies

We consider first the case of autocracies. These are defined as political regimes in which leaders are not subject to periodic elections. Incumbents thus stay in power with certainty:<sup>9</sup>

**Assumption 1** *Autocratic leaders cannot be removed from office:  $p_{AU}^t(h^t, a^t) = 1$  for any  $h^t, a^t$ .*

#### Democracies

In representative democracies, periodic elections allow voters to discipline their leaders and deter them from breaking peaceful relations. For simplicity, we focus on one-period mandates, though our analysis can be readily extended to terms lasting longer periods.

We assume that politicians are rewarded if they are able to sustain peaceful relations and are punished if they behave aggressively:<sup>10</sup>

<sup>9</sup>Our results continue to hold if we assume that autocratic leaders have an exogenous probability of retaining office. What matters is that in autocracies, citizens cannot discipline politicians through the electoral system.

<sup>10</sup>The re-election chances of a democratic leader who deploys force are assumed to be independent of the behavior



**Assumption 2** *Democratic leaders have higher chances of being re-elected in peaceful periods than when they use force:  $p_{DE}^t(h^t, (C, C)) \equiv \bar{p} > p_{DE}^t(h^t, (D, \cdot)) \equiv \underline{p}$ .*

Notice that Assumption 2 is in line with the interests of voters, who want to deter politicians from engaging in costly conflicts.

It would, however, be against the interests of voters if their leader behaved cooperatively when the other country defects. We thus assume the following:

**Assumption 3** *When faced with aggressive behavior by the other country, democratic leaders have higher chances of being re-elected if they use force:  $p_{DE}^t(h^t, (D, D)) > p_{DE}^t(h^t, (C, D))$ .*

This assumption guarantees that it is always optimal for the leader of a country to play  $D$  when he expects the other country to be playing  $D$ .

Finally, we consider the case of representative democracies that impose term limits on their leaders. We focus our attention on two common types of executive term limits: those that rule out the possibility of re-election altogether (one-term limits); and those that allow for re-election only once (two-term limits). These are “strong” term limits, which clearly reduce the incumbent’s re-election motives.<sup>11</sup>

Consider first a “lame duck” democratic leader, who is serving his last possible term (the first term in a country with one-term limits or the second term in a country with two-term limits). In this case, re-election is ruled out by binding term limits:

**Assumption 4** *Lame duck democratic leaders cannot be re-elected:  $p_{LD}^t(h^t, a^t) = 0$  for any  $h^t, a^t$ .*

For a democratic leader serving his first of two possible terms, the probability of re-election,  $p_{FT}^t$ , is as described in Assumptions 2 and 3.

## 2.4 Leaders’ strategies and equilibrium concept

A strategy of the policymaker of country  $i$  is a function  $\sigma_i : H \rightarrow A$ . Note that there is no explicit mention of the identity of the policymaker playing at each period in the strategies. This is not necessary, since the recursive formulas take into account the election results which are incorporated in the history. Hence, the strategies take into account the identity of the policymakers, which depend on histories.

A repeated game with elected players is defined by: the two sets of policymakers  $L_i$  and  $L_j$ , the prisoners’ dilemma stage game  $\Gamma = (A, \Pi)$ , the parameters  $\alpha$  and  $Z$ , and an electoral process  $p$ . We study subgame-perfect equilibria in which each policymaker chooses a strategy  $\sigma_i$  so as to

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of the other country’s leader. Allowing  $p_i^t(h^t, (D, D))$  to differ from  $p_i^t(h^t, (D, C))$  would not affect the main results of our analysis.

<sup>11</sup>We do not consider here the case of democracies with “weak” term limits, which only set a restriction on the number of *consecutive* terms an executive can serve. These cases are less common and are somewhat intermediate between scenarios with no term limits and scenarios with “strong” term limits.

maximize his payoff, taking as given the electoral process and the strategy of the other country's policymaker.

The main idea of sustaining cooperation in repeated games is that, when players are patient enough, short-run opportunism is more than compensated by the long-run gains of maintaining a cooperative relationship. It is well known that in repeated games many equilibria are possible. In what follows, we examine the sustainability of the efficient equilibrium, along which the two countries are always at peace with each other. By comparing conditions under which international peace can be sustained in different political regimes, we will show that electoral incentives can provide a simple theoretical explanation for the fact that democracies almost never fight each other, and that binding term limits eliminate differences in the incentives of democratic and autocratic leaders.

Cooperation between countries is a dynamic phenomenon. Equilibrium strategies must satisfy incentive constraints that involve a comparison between short-run defection gains and long-run punishment losses. Cooperation is possible when policymakers believe that any aggressive behavior will be followed by tough retaliation.

Given that aggressive behavior leads to immediate gains for the attacker, while war emerges only as future retaliation, the possibility of cooperation depends on the discount factor that summarizes the relative importance of current versus future payoffs. The easiest way to enforce the cooperative equilibrium is to punish deviations as harshly as possible. In the context of a prisoners' dilemma, maximal punishments take a simple form: they correspond to the infinite repetition of the static Nash equilibrium. We thus focus on Nash-reversion punishment strategies.<sup>12</sup>

For each country pair, we can compute the critical discount factor that allows peace to be sustained between their leaders. In line with the literature on repeated games, we will interpret the critical discount factor as an indicator of the likelihood of conflicts: the lower the required degree of patience to sustain peace, the higher the probability that a conflict will arise.

Crucially, peace is dyadic in nature: it can only be achieved if neither of the leaders has incentives to defect from it. The sustainability of peace in a country pair thus depends on the incentives of both leaders. To compute the critical discount factor for a country pair  $i, j$ , we first derive the critical factors  $\delta_i$  and  $\delta_j$  linked to their leaders' individual incentive constraint. These incentive constraints compare the payoff of cooperation to the payoff of deviation when each leader believes the other country is going to cooperate. For cooperation to be sustainable, both incentive constraints need to be satisfied. The critical discount factor for the dyad is thus the maximum between the two individual critical discount factors.

We will then compare the sustainability of peace across different types of dyads. We will interpret a higher critical discount factor as an indicator of a higher likelihood of conflicts.<sup>13</sup>

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<sup>12</sup>Starting from Dixit (1987), these strategies have been studied extensively in the context of self-enforcing cooperation. Note that the main results carry through when we consider renegotiation-proof punishment strategies as in Van Damme (1989). The analysis is available upon request.

<sup>13</sup>The critical discount factor reflects how easy it is to sustain peace. In equilibrium, either two countries always cooperate or they always defect. In the Appendix, we show that the model can be extended to obtain periods of conflict followed by periods of peace, if payoffs change from period to period.

### 3 The sustainability of peace

In this section, we examine the conditions under which peace can be sustained as a subgame perfect equilibrium in trigger strategies between two countries. Given the dyadic nature of peace, there will be three cases to examine: dyads composed of two autocracies, dyads composed of two democracies, and mixed dyads. For now, we consider democracies in which leaders are not facing term limits. The role of term limits is examined in Section 4.

#### 3.1 Autocratic dyads

In the case of an autocratic leader, the value of sustaining peace corresponds to the sum of discounted cooperative payoffs  $\pi^C$  and the office rents  $Z$ :

$$V_{AU}^C \equiv \sum_{t=0}^{\infty} \delta^t (\pi^C + Z) = \frac{\pi^C + Z}{1 - \delta}, \quad (2)$$

where the subscript  $AU$  refers to autocratic leaders. The continuation value of being in a military conflict forever is instead given by

$$V_{AU}^N \equiv \sum_{t=0}^{\infty} \delta^t (\pi^N + Z) = \frac{\pi^N + Z}{1 - \delta}. \quad (3)$$

Under the assumption of Nash-reversion punishment strategies, a surprise military attack at time  $t$  yields deviation gains equal to  $\pi^D - \pi^C$  in that period, but leads to reversion to the non-cooperative payoffs equilibrium  $\pi^N$  forever after. The punishment associated with Nash reversion is the long-term loss of the gains associated with cooperation, which can be written as

$$\Omega_{AU} \equiv V_A^C - V_A^N = \frac{\pi^C - \pi^N}{1 - \delta}. \quad (4)$$

A common choice of  $C$  can be supported by Nash-reversion punishment strategies as long as the following incentive constraint is satisfied:

$$\pi^D - \pi^C \leq \delta \Omega_{AU}. \quad (5)$$

The minimum discount factor  $\delta_{AU}$  above which an autocratic leader will have incentives to sustain peace is the  $\delta$  that satisfies (5) with equality. We can state the following:

**Result 1** *In autocratic dyads, peace will be sustained as long as the leaders' discount factor is at least  $\delta_{AU}$ .*

As mentioned above, the critical discount factor  $\delta_{AU}$  represents a measure of the difficulty to sustain peace between autocratic leaders. Notice that, when policymakers are not subject to re-election, the extent of their opportunism ( $Z$ ) does not affect their incentives to enter a military

conflict. As we will see below, this is not the case for democratically-elected leaders, who can lose office and the associated rents.

### 3.2 Democratic dyads

We now examine the sustainability of peace between democratic countries, in which the leaders are subject to periodic elections.

As discussed above, we assume that voters can commit to reward “good deeds” (that is, to re-elect policymakers who have behaved cooperatively) and punish “bad deeds” (that is, to dismiss policymakers who have behaved noncooperatively). In this setting, we will show that the threat of not being re-elected acts as a discipline device, making democratic policymakers less likely to trigger military conflicts.<sup>14</sup>

In the case of a democratic leader, the value of sustaining international peace corresponds to the sum of discounted cooperative payoffs  $\pi^C$  plus the sum of discounted rents, taking into account that they remain in power with probability  $\bar{p}$  as long as peace is sustained:

$$V_{DE}^C \equiv \frac{\pi^C}{1 - \delta} + \frac{Z}{1 - \bar{p}\delta}, \quad (6)$$

where the subscript  $DE$  refers to a democratic leader. The continuation value of being in a military conflict forever is computed in a similar fashion:

$$V_{DE}^N \equiv \frac{\pi^N}{1 - \delta} + \frac{Z}{1 - \underline{p}\delta}. \quad (7)$$

Comparing these continuation values with (2) and (3), we can see that, for  $\bar{p}$  and  $\underline{p}$  smaller than unity, both the continuation value of cooperation and the continuation value of being at war are lower for democratic leaders than for autocrats. International peace can be supported by Nash-reversion punishment strategies as long as the following incentive constraint is satisfied:

$$\pi^D - \pi^C \leq \delta\Omega_{DE}, \quad (8)$$

where

$$\Omega_{DE} \equiv \frac{\pi^C - \pi^N}{1 - \delta} + Z \left( \frac{\bar{p}}{1 - \bar{p}\delta} - \frac{\underline{p}}{1 - \underline{p}\delta} \right). \quad (9)$$

Contrary to the case of autocratic leaders, the incentives of democratic leaders to break peace depend crucially on the level of the office rents  $Z$ . Under Assumption 2, costly conflicts reduce leaders’ chances to hold on to power. To verify this, notice that breaking peace at time  $t$  lowers

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<sup>14</sup>We have also examined retrospective voting. In this case, democratic leaders have additional incentives to deviate since, in addition to the appropriation gains, they gain an “electoral boost”; other things being equal, this leads to less cooperation. However, short-term gains can be more than offset by the long-term political costs associated with being in a military conflict and hence electoral incentives can still deter policymakers from breaking international peace. Our key results are robust to this alternative modeling of voting behavior. The analysis is available upon request.

the chances of being re-elected from period  $t + 1$  onwards from  $\bar{p}$  to  $\underline{p}$ , implying a loss in terms of expected rents.

We can use (8) to derive the minimum discount factor  $\delta_{DE}$  above which a democratic leader will have incentives to sustain peace. We can state the following:

**Result 2** *In democratic dyads, peace will be sustained as long as the leaders' discount factor is at least  $\delta_{DE}$ .*

Comparing equations (5) and (8), we can see that the one-period gains from breaking peaceful relations are the same for autocratic and democratic leaders. The incentive constraints of autocratic and democratic leaders only differ with respect to the long-run punishment for breaking peace. In particular, the punishment faced by democratic leaders is unambiguously more severe than the corresponding punishment faced by autocratic leaders, i.e.  $\Omega_{DE} > \Omega_{AU}$ . In turn, this implies that the critical discount factor above which peace can be sustained for democracies ( $\delta_{DE}$ ) is lower than the corresponding discount factor for autocracies ( $\delta_{AU}$ ).

The best-case scenario for peace is one in which voters can commit to *always* re-elect policymakers who have behaved cooperatively and *always* dismiss policymakers who have behaved noncooperatively. This voting behavior maximizes the punishment for breaking international peace and is the most conducive to cooperation. In this case, with re-election probabilities  $\bar{p} = 1$  and  $\underline{p} = 0$ , the critical discount factor is equal to  $\frac{\pi^D - \pi^C}{\pi^D - \pi^N + Z}$ .

### 3.3 Mixed dyads

We next consider mixed dyads—country pairs involving a democracy and an autocracy. This case is a bit more complex than the previous two, given that the country leaders have different incentive constraints.

Peace between two countries can only be sustained as an equilibrium if neither of the leaders has incentives to defect. The regime that is less prone to cooperation then drives a dyad's ability to cooperate. In turn, this implies that the critical discount factor that allows to sustain peace between a democracy and an autocracy is  $\delta_{AU}$ , which is the maximum between the two individual critical discount factors. Conflicts should thus be as likely to arise between autocracies and between democracies and autocracies.

To understand this result, notice that a democratic leader has always incentives to defect when he expects the other leader (an autocrat) to defect: compared to being “cheated” upon, this outcome leads both to a higher period payoff and a higher probability of being re-elected. Thus whether or not peace can be sustained in a mixed dyad depends only on the incentive constraint of the autocratic leader.

**Result 3** *In mixed dyads, peace will be sustained as long as the leaders' discount factor is at least  $\delta_{AU}$ .*

### 3.4 The democratic peace

In our model, the incentives of country leaders to maintain peace depend on the type of political regime. As mentioned above, defecting from peace generates the same short-run gains for autocratic and democratic leaders. The key difference is in the punishment for defecting, which is unambiguously more severe when leaders face re-election. As a result, the critical discount factor above which peace can be sustained ( $\delta_{DE}$ ) is lower than the corresponding discount factor for autocracies and mixed dyads ( $\delta_{AU}$ ). It follows that conflicts between pairs of democratic countries will be less likely than conflicts between non-democratic countries.

We can thus state the following result:

**Proposition 1** *Conflicts in democratic dyads are less likely than conflicts in autocratic and mixed dyads.*

Proposition 1 provides a rationale for the democratic peace phenomenon, the first of the three facts listed at the start of Section 2: the threat of losing office can act as a discipline device, deterring democratic leaders from breaking peaceful relations. It can also explain the dyadic nature of this phenomenon: while democracies rarely fight each other, they regularly fight autocracies.

One limitation of the model is that, in equilibrium, two countries will always be either at war or at peace with each other. In the Appendix, we show that, by introducing a stochastic component in the countries' payoffs, we can generate cycles of war and peace periods on the equilibrium path while keeping the logic of the democratic peace result. The analysis is close in spirit to the analysis of price wars in repeated games models of tacit collusion (see for instance Rotemberg and Saloner, 1986). In that framework, the critical discount factor directly translates in the likelihood of conflicts. An environment with critical discount factor means everything else equal that the two countries have a likelihood of being in conflict at a given time. The lower the discount factor, the lower the associated probability that the two countries are in conflict in a given period.

## 4 The impact of term limits

In this section, we consider the case of democracies in which the leaders face restrictions on the number of mandates they can serve. This allows us to provide a theoretical rationale for the empirical findings on the impact of term limits on military conflicts.

Restrictions on the tenure of the executive eliminate the disciplining effect of electoral accountability and reduce the incentives for cooperation. We would thus expect democratic leaders who cannot be re-elected to be more conflict prone than democratic leaders who can be re-elected.

Consider the incentive constraint of a lame duck democratic leader:

$$\pi^D - \pi^C \leq \delta\Omega_{LD} \tag{10}$$

where

$$\Omega_{LD} = \frac{\pi^C - \pi^N}{1 - \delta}. \quad (11)$$

Comparing (10) with (5), we see that the incentives of a lame duck democratic leader coincide with those of an autocratic leader. This implies that the minimum discount factor that allows a democratic leader in his last term to sustain peace is equal to  $\delta_{LD} = \delta_{AU}$ . The intuition behind this result is simple: in both cases, incumbent politicians are not accountable to the electorate. No matter what they do, autocratic leaders remain in office and continue to receive rents  $Z$ . Similarly, no matter what they do, lame duck democratic leaders lose office and the associated rents.

Lame duck democratic leaders are thus as conflict prone as autocratic leaders. To see this, notice that the short-run deviation gains are the same for all leaders. Lame duck democratic leaders also face the same long-run punishment for breaking peace: in both cases, the leader is not accountable to the electorate, so there is no “re-election penalty”; the only punishment comes from the cost of being at war rather than at peace with the other country, which is independent of whether or not a politician is in office.

It follows that:

**Proposition 2** *Conflicts between democracies in which the executives face binding term limits are as likely as conflicts involving autocracies.*

Proposition 2 provides a rationale for the second of the three facts listed at the beginning of Section 2. Binding term limits eliminate the incumbent’s payoffs from future periods in office, thus limiting voters’ ability to punish leaders who start costly conflicts. Democratic leaders who cannot be re-elected should thus be as conflict prone as autocratic leaders who do not face elections.

Finally, consider the case of democratic leaders who face two-term limits, i.e. can only be re-elected once. In first term, his incentives constraint can be written as

$$\pi^D - \pi^C \leq \delta \Omega_{FT}, \quad (12)$$

where

$$\Omega_{FT} = \frac{\pi^C - \pi^N}{1 - \delta} + \delta Z(\bar{p} - \underline{p}). \quad (13)$$

It is straightforward to verify that  $\Omega_{FT}$  is larger than  $\Omega_{AU}$  but smaller than  $\Omega_{DE}$ . Comparing (12) with (5) and (8), it follows that democratic leaders serving the first of two possible terms should be less tempted to break peace than an autocratic leader/lame duck democratic leader, but more tempted than a democratic leader who does not face term limits.

We can state the following:

**Proposition 3** *Conflicts involving democracies in which the leaders serve the first of two possible terms are less likely than conflicts involving autocracies, but more likely than conflicts involving democracies without term limits.*

Our model thus implies that democracies in which the leaders face two-term limits should be likely to fight with other democracies during the executive's last mandate. The intuition for this result is simple: in the first term, the possibility of being re-elected keeps the leader in check, deterring him from starting costly conflicts; in the second term, the leader is a lame duck and thus cannot be disciplined by re-election motives.

Proposition 3 provides a rationale for the last of the three facts listed at the end of Section 2: conflicts involving democracies with two-term limits are more likely in the executive's last mandate than in the penultimate one.

## 5 Conclusion

One of the few stylized facts in international relations is that democracies, unlike autocracies, almost never fight each other. Recent empirical findings show that binding term limits invalidate this result, making lame duck democratic leaders as conflict prone as autocratic leaders. The type of term limits also matters: in democracies pairs in which the leaders face two-term limits, conflicts are less likely to arise in the first mandate, when re-election incentives are still at work.

To rationalize these findings, we have presented a theoretical model that allows to study the sustainability of international peace between democracies and autocracies and the impact of term limits on the likelihood of conflicts. Our model of war and peace is a standard two-country repeated prisoners' dilemma game, in which the use of military force is beneficial in the short-run, but has long-term detrimental consequences: each country is tempted to attack the other to obtain a portion of its wealth and resources; however, if both countries use force, the resulting military conflict is costly compared to being at peace. Peace can only be sustained if the leaders of both countries have incentives to cooperate. Country leaders are office motivated. Crucially, they are also "biased", i.e. they are more tempted to break peaceful relations than their citizens (because they take into account only a fraction of the military costs or, equivalently, obtain a larger share of the gains when attacking the other country). In this setting, electoral incentives can discipline leaders toward more peaceful behavior.

Our model formalizes the Kantian idea that electoral accountability can deter leaders from starting costly conflicts. The fear of losing office can make it less tempting for democratic leaders to wage war against each other. Crucially, this discipline effect can only be at work if incumbent leaders can be re-elected. In democracies without term limits, periodic elections provide the means by which the electorate can hold opportunistic political leaders accountable for their foreign policy decisions. Conversely, in autocracies and democracies with term limits, politicians are freer to adopt unpopular policies, knowing that this will have no repercussion on whether or not they are able to stay in power. In the case of democracies with two-term limits, conflicts are less likely to arise during the executive first term, when the discipline effect of elections is still at work.

Our analysis suggests that, although domestic politics may provide a rationale for introducing term limits in representative democracies, restricting the executives' tenure may have detrimental



consequences for international relations, hindering the sustainability of peaceful relations between countries.

## References

- Alt, J., E. Bueno de Mesquita, and S. Rose (2011). "Disentangling Accountability and Competence in Elections: Evidence from U.S. Term Limits," *Journal of Politics* 73, 171-186.
- Bagwell, K., and R. Staiger (1999). "An Economic Theory of GATT," *American Economic Review* 89, 215-248.
- Baliga, S., D. Lucca, and T. Sjöström (2011). "Domestic Political Survival and International Conflict: Is Democracy Good for Peace?," *Review of Economic Studies* 78, 458-486.
- Banks, J. S., and R. Sundaram (1998). "Optimal Retention in Agency Problems," *Journal of Economic Theory* 82, 293-323.
- Barro, R. (1973). "The Control of Politicians: An Economic Model," *Public Choice* 14, 19-42.
- Besley, T., and R. Burgess (2002). "The Political Economy of Government Responsiveness: Theory and Evidence from India," *Quarterly Journal of Economics* 117, 1415-1451.
- Besley, T., and A. Case (1995). "Does Electoral Accountability Affect Economic Policy Choices? Evidence from Gubernatorial Term Limits," *Quarterly Journal of Economics* 110, 769-798.
- Bueno de Mesquita, B. (2006). "Game Theory, Political Economy, and the Evolving Study of War and Peace," *American Political Science Review*, 100, 637-642.
- Bueno de Mesquita, B., J. D. Morrow, R. Siverson, and A. Smith (1999). "An Institutional Explanation of the Democratic Peace," *American Political Science Review* 93, 791-807.
- Conconi, P., and N. Sahuguet (2009). "Policymakers' Horizon and the Sustainability of International Cooperation," *Journal of Public Economics* 93, 549-558.
- Conconi, P., N. Sahuguet, and M. Zanardi (2014). "Democratic Peace and Electoral Accountability," *Journal of the European Economic Association* 12, 997-1028.
- Crémer, J. (1986). "Cooperation in Ongoing Organizations," *Quarterly Journal of Economics* 101, 33-49.
- Dick, A. R., and J. R. Lott (1993). "Reconciling Voters' Behavior with Legislative Term Limits" *Journal of Public Economics* 50, 1-14.
- Dixit, A. (1987). "Strategic Aspects of Trade Policy," in Bewley, T. (ed.) *Advances in Economic Theory: Fifth World Congress*, 329-362. Cambridge, MA: Cambridge University Press.
- Dixon, W. J. (1994). "Democracy and the Peaceful Settlement of International Conflict," *American Political Science Review* 88, 14-32.
- Dixon, W. J., and P. D. Senese (2002). "Democracy, Disputes, and Negotiated Settlements," *Journal of Conflict Resolution* 46, 547-571.

- Ederington, J. (2001). "International Coordination of Trade and Domestic Policies," *American Economic Review* 91, 1580-1593.
- Fearon, J. D. (1994). "Domestic Political Audiences and the Escalation of International Disputes," *American Political Science Review* 88, 577-592.
- Fearon, J. (1997). "Signalling Foreign Policy Interests: Tying Hands versus Sinking Costs," *Journal of Conflict Resolution* 41, 68-90.
- Ferraz, C., and F. Finan (2009). "Electoral Accountability and Corruption: Evidence from the Audits of Local Governments," *American Economic Review* 101, 1274-1311.
- Gaubatz, K. T. (1991). "Election Cycles and War," *Journal of Conflict Resolution* 35, 212-244.
- Glaeser, E. L. (1997). "Self-Imposed Term Limits," *Public Choice* 93, 389-394.
- Glazer, A., and M. Wattenberg (1996). "How Will Term Limits Affect Legislative Work?" in Grofman, B. (Ed.), *Legislative Term Limits: Public Choice Perspectives*. Kluwer Academic, Boston, Dordrecht and London.
- Haynes, K. (2012). "Lame Ducks and Coercive Diplomacy: Do Executive Term Limits Reduce the Effectiveness of Democratic Threats?" *Journal of Conflict Resolution* 56(5), 771-798.
- Jackson, M., and M. Morelli (2007). "Political Bias and War," *American Economic Review*, 97, 1353-1373.
- Jervis, R. (1978). "Cooperation Under the Security Dilemma," *World Politics* 30, 167-214.
- Kandori, M. (1992). "Repeated Games Played by Overlapping Generations of Players," *Review of Economic Studies* 59, 81-92.
- Kant, E. [1795] (1957). *Perpetual Peace*, translated by Lewis White Beck. New York: The Library of Liberal Arts, Bobbs-Merrill.
- Levy, J. (2002). "War and Peace," in W. Carlsnaes, T. Risse, and B. A. Simmons (eds.), *Handbook of International Relations*. London: Sage.
- Levy, G., and R. Razin (2004). "It Takes Two: An Explanation for the Democratic Peace," *Journal of the European Economic Association* 2, 1-29.
- List, J. A., and D. M. Sturm (2006). "How Elections Matter: Theory and Evidence from Environmental Policy," *Quarterly Journal of Economics* 121, 1249-1281.
- Maoz, Z. (2005). Dyadic MID Dataset: <http://psfaculty.ucdavis.edu/zmaoz/dyadmids.html>.
- Maoz, Z., and B. Russett (1993). "Normative and Structural Causes of Democratic Peace," *American Political Science Review* 87, 624-638.
- Martin, P., T. Mayer, and M. Thoenig (2008). "Make Trade not War?," *Review of Economic Studies* 75, 865-900.
- Monty, G. M., and K. Jagers (2002). Polity IV Data Set. [Computer file; version p4v2004] College Park, MD: Center for International Development and Conflict Management, University of Maryland.

- Rotemberg, J. J., and G. Saloner (1986). "A Supergame-Theoretic Model of Price Wars during Booms," *American Economic Review* 76, 390-407.
- Russett, B., and J. Oneal (2001). *Triangulating Peace*. New York: Norton.
- Salant, D. (1991). "A Repeated Game with Finitely Lived Overlapping Generations of Players," *Games and Economics Behavior* 3, 244-259.
- Schultz, K. A. (1998). "Domestic Opposition and Signaling in International Crises," *American Political Science Review* 92, 829-824.
- Smart, M., and D. M. Sturm (2013). "Term Limits and Electoral Accountability," *Journal of Public Economics* 107, 93-102.
- Smith, L. (1992). "Folk Theorems in Overlapping Generations Games," *Games and Economics Behavior* 4, 426-449.
- Van Damme, E. (1989). "Renegotiation-Proof Equilibria in Repeated Prisoners' Dilemma," *Journal of Economic Theory* 47, 206-217.
- Zeigler S., Pierskalla, J. and S. Mazumder, (2013) "War and the Reelection Motive: Examining the effect of term limits," *Journal of Conflict Resolution* 58, 658-684.

## Appendix: Stochastic payoffs

In the model described in Sections 2-4, any pair of countries is either always at war or at peace. In this appendix, we show that the model can be extended to allow for the possibility of cycles of war and peace on the equilibrium path.

We introduce a stochastic component in the countries' payoffs matrix, in the spirit of Rotemberg and Saloner (1986). More specifically, we assume that at every period  $t$ , the payoffs matrix of the dyad is affected by a shock  $S^t$ . The shocks  $S^t$  are identically and independently distributed according to a distribution  $F$  whose support is  $[0, \bar{S}]$ . Table A-1 summarizes the effects of the shock on the countries' payoffs. Notice that the shock  $S$  only affects  $\tilde{\Pi}^D$  and  $\tilde{\Pi}^P$ . This implies that breaking peace is more or less tempting in different periods, since the fraction of resources that can be acquired by attacking the other country varies.

Table A-1: Prisoners' dilemma (countries' payoffs)

		1	
		C	D
2	C	$\tilde{\Pi}^C = W$	$\tilde{\Pi}^D = (1 - K + G)W + S$
	D	$\tilde{\Pi}^P = (1 - G)W - S$	$\tilde{\Pi}^N = (1 - K)W$

As in the benchmark model, leaders are assumed to have different preferences from their citizens. Politicians derive rents  $Z$  while in power and only take into account a fraction  $\alpha$  of the total costs incurred by their country when deploying military force. From their point of view, the payoffs of the stage game are  $\tilde{\pi}^D = (1 - \alpha K + G)W + S = \pi^D + S$ ,  $\tilde{\pi}^C = W = \pi^C$ ,  $\tilde{\pi}^N = (1 - \alpha K)W = \pi^N$ , and  $\tilde{\pi}^P = (1 - G)W - S = \pi^P - SW$ .

In what follows, we focus on equilibria in which as much cooperation as possible can be sustained between two countries. As we did in the benchmark model, we examine the conditions under which cooperation can be sustained in all three possible dyads.

### A-1 Autocracies

We focus on an equilibrium in trigger strategies of the form:

Cooperate in period  $t = 0$  if  $S^t \leq \bar{S}_{AU}$ , where  $\bar{S}_{AU}$  is the threshold for cooperation in the autocratic dyad;

Cooperate in period  $t$  if  $S \leq \bar{S}_{AU}$  and both players have cooperated before whenever  $S^t \leq \bar{S}_{AU}$ , defect otherwise.

We can compute the expected value of sustaining cooperation from the point of view of autocratic leaders. With probability  $F(\bar{S}_{AU})$ , the two countries cooperate, while with probability

$(1 - F(\bar{S}_{AU}))$  the shock is high and both countries find it too tempting to defect. The continuation value of cooperation can thus be written as:

$$\tilde{V}_{AU}^C \equiv \frac{F(\bar{S}_{AU})\pi^C + (1 - F(\bar{S}_{AU}))\pi^N + Z}{1 - \delta}, \quad (14)$$

while the continuation value of noncooperation is given by:

$$\tilde{V}_{AU}^N \equiv \frac{\pi^N + Z}{1 - \delta}. \quad (15)$$

We have a subgame-perfect Nash equilibrium if players have the incentive to cooperate when the shock is low enough and the other player is following the equilibrium strategy. Given the prisoners' dilemma payoffs and the discount factor, we can solve for the maximum  $\bar{S}_{AU}$  for which the following condition is satisfied:

$$\pi^D + \bar{S}_{AU} - \pi^C \leq \delta \tilde{\Omega}_{AU}, \quad (16)$$

where

$$\tilde{\Omega}_{AU} = \tilde{V}_{AU}^C - \tilde{V}_{AU}^N = \frac{F(\bar{S}_{AU})(\pi^C - \pi^N)}{1 - \delta}. \quad (17)$$

On the equilibrium path, autocratic dyads will experience cycles of cooperation and conflict. The probabilities of war and peace are given by  $1 - F(\bar{S}_{AU})$  and  $F(\bar{S}_{AU})$  respectively.

## A-2 Democracies

To simplify the analysis, we consider the case where re-election probabilities of democratic leaders are equal to  $\bar{p} = 1$  and  $\underline{p} = 0$ .

We focus on an equilibrium in trigger strategies of the form:

Cooperate in period  $t = 0$  if  $S^t \leq \bar{S}_{DE}$ , where  $\bar{s}_D$  is the threshold for cooperation in the democratic dyad;

Cooperate in period  $t$  if  $S^t \leq \bar{S}_{DE}$  and both players have cooperated before whenever  $S \leq \bar{S}_{DE}$ , defect otherwise.

With probability  $F(\bar{S}_{DE})$ , the shock is low enough for the two countries to be able to sustain peace; in this case, incumbent policymakers get re-elected; with probability  $(1 - F(\bar{S}_{DE}))$  the shock is high, the two countries are at war and incumbent policymakers do not get re-elected. For democratic leaders, the continuation values of cooperation and noncooperation are respectively given by

$$\tilde{V}_{DE}^C \equiv \frac{F(\bar{S}_{DE})\pi^C + (1 - F(\bar{S}_{DE}))\pi^N + Z}{1 - \delta}, \quad (18)$$

and

$$\tilde{V}_{DE}^N \equiv \frac{\pi^N}{1 - \delta}. \quad (19)$$

Peace is sustained when the shock is below the threshold identified by this condition:

$$\pi^{DE} + \bar{S}_{DE} - \pi^C \leq \delta \tilde{\Omega}_{DE}, \quad (20)$$

where

$$\tilde{\Omega}_{DE} = \tilde{V}_{DE}^C - \tilde{V}_{DE}^N = \frac{F(\bar{S}_{DE})(\pi^C - \pi^N) + Z}{1 - \delta}. \quad (21)$$

For given countries' payoffs, discount factor  $\delta$  and office rents  $Z$ , we can obtain the critical threshold  $\bar{S}_{DE}$  below which two democracies will be at peace.

Comparing (17) with (21), it is straightforward to verify that the punishment following a defection is always larger for democratic leaders than for autocrats. The intuition is the same as in our benchmark model: if they break peaceful relations, democratic leaders can lose the benefits of holding office ( $Z$ ). Given that the deviation gains are the same for autocratic and democratic leaders, it follows that  $\bar{S}_{DE}$  always weakly exceeds  $\bar{S}_{AU}$ . As a result, democratic dyads will be at war less often than autocratic dyads.

### A-3 Term limits

Finally, consider lame duck democratic leaders, who face finding term limits. In this case, the continuation value of sustaining peace can thus be written as

$$\tilde{V}_{LD}^C \equiv \frac{F(\bar{S}_{LD})\pi^C + (1 - F(\bar{S}_{LD}))\pi^N}{1 - \delta}, \quad (22)$$

while the continuation value of being in a conflict is given by

$$\tilde{V}_{LD}^N \equiv \frac{\pi^N}{1 - \delta}. \quad (23)$$

The incentive constraint of lame duck democratic leaders can then be written as

$$\pi^D + \bar{S}_{LD} - \pi^C \leq \delta \tilde{\Omega}_{LD}, \quad (24)$$

where

$$\tilde{\Omega}_{LD} = \tilde{V}_{LD}^C - \tilde{V}_{LD}^N = \frac{F(\bar{S}_{LD})(\pi^C - \pi^N)}{1 - \delta}. \quad (25)$$

Comparing (25) with (17), it is straightforward to verify that the punishment of breaking peace is the same for lame duck democratic leaders and autocratic leaders. As in Section 4, the intuition behind this result is that, in both cases, incumbent politicians are not accountable to the electorate: no matter what they do, autocratic leaders remain in office and continue to receive rents  $Z$ ; similarly, no matter what they do, lame duck democratic leaders lose office and the associated rents.