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THE SUSTAINABILITY OF
INTERNATIONAL COOPERATION**

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Paola Conconi, ECARES and University of Warwick and CEPR
Nicolas Sahuguet, Ecole des HEC

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Centre for Economic Policy Research
90–98 Goswell Rd, London EC1V 7RR, UK
Tel: (44 20) 7878 2900, Fax: (44 20) 7878 2999
Email: cepr@cepr.org, Website: www.cepr.org

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ABSTRACT

Re-election Incentives and the Sustainability of International Cooperation*

This paper examines the impact of policy-makers' horizons on the sustainability of international cooperation. We describe a prisoners' dilemma game between two infinitely-lived organizations (countries) run by agents (policy-makers) with a shorter tenure. The agents' mandates are finite but potentially renewable and staggered across different organizations. We show that the efficient cooperative equilibrium is only sustainable when policy-makers are re-electable. Moreover, re-election incentives can act as a discipline device, making it easier to sustain cooperation between policy-makers with renewable mandates than between policy-makers who are automatically re-elected. However, if the chances of re-election depend significantly on recent performance, policy-makers will collude to get re-elected. In this case, term limits may help to sustain international cooperation.

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Paola Conconi
ECARES, ULB
CP114
Avenue F.D. Roosevelt 50
1050 Bruxelles
BELGIUM
Tel: (32 2) 650 3426
Fax: (32 2) 650 4475
Email: pconconi@ulb.ac.be

Nicolas Sahuguet
Institute for Applied Economics
HEC Montréal
3000 Chemin de la Côte-Sainte-
Catherine
Montréal H3T 2A7
(Québec)
CANADA
Tel: (1 514) 340 6031
Fax: (1 514) 340 6464
Email: nicolas.sahuguet@hec.ca

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1 Introduction

It is widely acknowledged that, in the absence of a supranational authority with direct powers to punish violations, governments can only be expected to comply with international agreements if they perceive that doing so is in their self interest. The increasingly vast literature on self-enforcing international agreements shows how cooperation among policymakers of different countries can be sustained by credible threats among the parties involved as long as they engage in long-term relationships (e.g. Bagwell and Staiger, 1997; Maggi, 1999; Ederington, 2001; Conconi and Perroni, 2004). Consequently, even when a policymaker can gain in the short term by cheating on her partners, she will behave honestly for fear of future punishments.

Achieving international cooperation through repeated interaction may, however, be particularly difficult given that, although countries may live on indefinitely, they are run by policymakers who have a shorter tenure. This problem has been completely disregarded by the existing literature on self-enforcing international agreements, where policymakers are assumed to share the same infinite horizon as their countries.

This paper examines how international cooperation can be sustained between policymakers with finite but potentially renewable mandates. In particular, we investigate the impact of policymakers' re-election incentives on the patterns of trade cooperation between their countries. By taking into account electoral cycles, our analysis provides a theoretical explanation for the non-stationary nature of tariffs,¹ which cannot be accounted for by the existing literature on self-enforcing trade agreements.²

The impact of electoral incentives in shaping a country's economic policies has long

¹Many studies have pointed out that trade barriers are characterized by cyclical fluctuations. These studies have focused on different countries, time periods and measures of protection. For example, McKeown (1984), Gallarotti (1985) and Hansen (1990) examine the cyclical behavior of tariffs over various historical periods for the UK, the US and Germany. Grilli (1988) shows cyclical tariff patterns of non-tariff barriers in the United States and the EC over the period 1969-1986, while Bohara and Kaempfer (1991) focus on the US for the period 1895-1970 and use average tariff rates calculated by taking the ratio of total revenue collected to the total value of dutiable imports.

²One notable exception is the paper by Bagwell and Staiger (2003), who develop a business cycle theory of protection. While in our analysis tariff fluctuations are the result of electoral cycles, in their paper they reflect the effectiveness with which countries can control beggar-thy-neighbor tendencies during recessions and booms.

been recognized by the literature on political business cycles.³ Most studies have focused on the determination of policy issues which tend to be at the “frontline” in national elections, such as government spending or the degree of income and wealth redistribution. Others have examined the impact of electoral incentives on the determination of “secondary” policy issues such as trade policy, which have less of an impact on the majority of voters (e.g. Grossman and Helpman, 2004).⁴

Putnam (1988) was the first to stress that domestic and international politics are fundamentally intertwined.⁵ Subsequent studies have investigated the impact of domestic electoral considerations on international cooperation in various policy areas, including fiscal (Tabellini, 1990), monetary (Lohmann, 1993) and trade policy (Grossman and Helpman, 1995; Ornelas, 2003). However, somewhat surprisingly given the importance of the enforceability problem in international relations, none of the existing studies has examined how policymakers’ horizon affects the sustainability of international cooperation, which is the focus of the present paper.

We describe international trade relations by means of a repeated prisoners’ dilemma game between two organizations (countries) that are run by agents (policymakers) with finite but potentially renewable mandates. Agents’ mandates are staggered, i.e. there is no single date at which there is a complete turnover of the leadership in all countries. In this general setup, we examine under what conditions the efficient cooperative equilibrium

³See, for example, Nordhaus (1975), Rogoff (1990) and Rogoff and Sibert (1988).

⁴There is some skepticism about the importance of re-elections for secondary policy issues. This is due to the fact that re-elections involve a multitude of policy issues but often amount to the binary option of retaining the incumbent or replacing him with a challenger; this implies that voters may find it optimal to remain uninformed about the policy choices of the incumbent on many secondary policy issues that have little impact on them. Nonetheless, electoral incentives can still play an important role in shaping secondary policy issues such as trade or environmental policy. This is because they substantially affect some citizens, who can either influence policy outcomes by forming lobby groups and offering campaign contributions to incumbent policymakers (e.g. Grossman and Helpman, 1994) or by becoming “single-issue voters”, i.e. voting for the politician considered most likely to implement their preferred policy on the particular issue (List and Sturm, 2004).

⁵Putnam (1988) describes international relations as a two-level game and provides the Bonn summit conference of 1978 as an example of how “genuine international policy coordination (...). Within each country, one faction supported the policy shift being demanded of its country internationally, but that faction was initially outnumbered. International pressure was a necessary condition for these policy shifts. On the other hand, without domestic resonance, international forces would not have sufficed to produce the accord” (429-430).

is sustainable—if at all—under the three scenarios in which an agent’s life span is finite, infinite or endogenously determined, depending on whether the renewal of her mandate is impossible, certain or a function of her past performance.

We focus first on the case in which the length of the agents’ life spans is *exogenously fixed* because of the existence of term limits.⁶ In this scenario, a policymaker will always have incentives to deviate in the last period of her mandate, given that she cannot be punished for doing so. Therefore the efficient equilibrium in which policymakers behave cooperatively over time is not sustainable. However, despite the finiteness of policymakers’ mandates, we show that some form of cooperation is still sustainable when their life spans overlap. In particular, the best sustainable equilibrium is characterized by agents acting cooperatively when “young” and defecting when “old”. Our analysis thus predicts that term limits should give rise to cyclical trade policy patterns, with higher trade barriers toward the end of a policymaker’s mandate.

We consider next the opposite scenario, in which policymakers are assumed to share the same *infinite* horizon as their countries. This is the benchmark case of the existing literature on self-enforcing international agreements and is equivalent to a situation in which policymakers’ mandates are automatically renewed. In this framework, we solve for the minimum degree of patience which guarantees that the efficient cooperative equilibrium is sustainable.

We then examine the intermediate case in which re-election is possible but not certain. In particular, we assume that an agent’s horizon is *endogenously determined* by her overall performance during the previous mandate. Indeed, ongoing organizations often exercise the power to retain an agent’s services or fire her, depending upon past performance. For example, the likelihood that an incumbent policymaker is re-elected usually depends on the benefits she managed to bring to her constituency during her previous term in office.

We show that, when re-election depends on past performance, cheating on a foreign partner generates two effects which are not present when re-election is certain: a short term “re-election boost” effect, which tends to decrease the severity of the punishment for defecting from cooperation; and a long-run “re-election penalty” effect, which works in the opposite direction. If the latter effect dominates, the minimum discount factor which allows to sustain cooperation over time will be lower when policymakers have finite

⁶Many countries impose term limits on the executive power. For example, the US constitution and practically all Latin American constitutions prohibit the re-election of the president, or set to two the maximum number of consecutive terms an incumbent can serve.

but renewable mandates than in the case of policymakers who stay in power forever. Therefore re-election incentives can discipline policymakers and make it easier to sustain international cooperation. Our analysis predicts that stable trade policy patterns should be observed both when policymakers are automatically re-elected and when re-election chances depend on their overall past performance.

Finally, we look at a scenario in which re-election is based on past performance but voting exhibits a recency bias, i.e. voters attach more importance to recent events when deciding whether or not to re-elect an incumbent. The existence of a recency bias is supported by a large research literature (see, among others, Fair (1978) for an early example and Lewis-Beck and Stegmaier (2000) for a review of the literature). For example, numerous studies have shown that the incumbent party's fortunes in US presidential elections depend significantly on recent economic conditions.⁷ We show that, if the recency bias is strong enough, policymakers will have incentives to collude to get re-elected, at the expense of cooperation between their countries. In particular, a "young" policymaker in one country (whose current performance has little effect on her future chances of re-election) will accommodate a defection by an "old" policymaker in the other country (whose current performance has a crucial impact on her immediate chances of re-election), expecting to receive a similar concession later in her mandate.⁸ In terms of trade policy predictions, the presence of a strong recency bias in voting should lead policymakers to set lower trade barriers at the beginning of their mandate and behave more aggressively closer to their re-election date.⁹ Notice that this is the same trade policy cycle predicted

⁷Eisenberg and Ketcham (2004), using data for 18 national US elections from 1932 to 2000, find that "only the most recent year of economic performance significantly determines the incumbent's party's vote share".

⁸Our analysis of how re-election incentives could affect international cooperation in the presence of a recency bias could help to explain, for example, why Prime Minister Tony Blair was accused of using British troops in Iraq to assist President Bush' re-election campaign: "So many people believe that the request for a redeployment of British troops has little or nothing to do with operational needs, and everything to do with political ones. Nothing to do with Iraqi re-elections, and everything to do with American re-elections . . . Ahead of a British re-election next May, Blair is hoping President Bush will return the favor by helping him in his second term" (BBC News, 22 October, 2004).

⁹One could interpret in this light, for example, the decision of US President George W. Bush to terminate the 1992 Civil Aircraft Agreement with Europe, which sets limits on the subsidies to the two top aircraft manufacturers Boeing and Airbus, and file a complaint at the WTO on October 6, 2004, one month before the presidential election. Indeed, it has been claimed that this decision was "a politically-motivated attempt to make President George W. Bush look tough on trade ahead of the poll" (BBC News,

when policymakers cannot be re-elected.¹⁰

In general, our analysis suggests that both the degree of trade cooperation sustainable between countries (the level of trade barriers) and the nature of the trade policy patterns (stationary or cyclical) should depend crucially on two main features of the domestic political system: whether policymakers are re-electable or subject to term limits; and the extent of the recency bias in the way voters evaluate the past performance of incumbent policymakers when deciding whether or not to reelect them. Our results have also important implications for the debate over the desirability of term limits: in the absence of a recency bias in voting, term limits will impede policymakers to engage in long-term relationships and thus limit the degree of international cooperation that can be achieved; if instead the chances of re-election depend significantly on recent performance, term limits might actually help to achieve more cooperation between countries, by eliminating their policymakers' incentives to collude to get re-elected.

Our paper builds on the existing literature on overlapping generations (OLG) repeated games, 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, the fundamental novelty of our paper is that we allow for agents' re-election, considering not only the case of exogenously-fixed mandates but also the case of endogenously-determined life spans.

Our analysis is also closely connected to a recent paper by Muthoo and Shepsle (2004), who examine the interaction between overlapping generations of agents belonging to an organization (e.g. different legislators in the US Senate), under the assumptions that their life spans are endogenously determined by past performance and that voting exhibits a recency bias. There are three main differences between our analysis and that of Muthoo and Shepsle (2004). First, while they focus on the interaction between agents belonging to *the same* organization, we are interested in how agents' horizon affects the sustainability of cooperation between *different* organizations. Second, they characterize the stage game

October 7, 2004). The dispute was resolved in January 2005, when US and European trade officials agreed to re-enter into bilateral negotiations after President Bush decided to “defer pursuing complaints with the World Trade Organization, a decision in sharp contrast to the campaign rhetoric in October” (Seattle Post-Intelligencer, January 12, 2005).

¹⁰However, it is important to stress that term limits will give rise to different trade policy predictions than recency bias if policymakers can be re-elected only once, since in this case there will be no incentive to cheat at the end of the first term.

as a game between two players bargaining over a unit-sized cake, in which whoever has the bargaining power makes a take it or leave it offer to the other player, while we describe it as a prisoners' dilemma game. Third, Muthoo and Shepsle (2004) focus only on the case of recency bias—which they refer to as the “what have you done for me lately?” principle—while we also consider the alternative scenarios in which the life span of an agents is exogenously-fixed, infinite, or endogenously determined by overall past performance.

The remainder of the paper is organized as follows. In Section 2, we describe a prisoners' dilemma game between two infinitely-lived countries. Section 3 examines the case of policymakers with exogenously fixed tenures, while Section 4 considers the case in which policymakers are automatically renewed in their mandates. Section 5 looks at the case of policymakers with renewable mandates and examines the impact of re-election incentives on the sustainability of international cooperation. Section 6 focuses on the implications of a recency bias in voting. Finally, Section 7 concludes.

2 An OLG Model of Cooperation

In this section, we describe international trade relations by means of a prisoners' dilemma (PD) game between two infinitely-lived organizations (countries), A and B , each represented by an agent (policymaker) with a shorter but potentially renewable tenure.

The fact that beggar-thy-neighbor policies—retaliating against one another with sequential trade restrictions—end up reducing national welfare has been well understood for a long time. The standard theory of trade agreements dates back to Johnson (1953-1954), who argued that, in the face of terms-or-trade effects arising from tariffs, countries could cooperate to make themselves better off through the avoidance of mutually destructive episodes of trade policy retaliation. He showed that, if the government of a large country imposes a tariff on an imported good, this leads to an increase in the price and a fall in demand for that good in the domestic market; in turn, this lowers the world price of the good concerned. The effect of the tariff is thus to reduce the price of imports relative to exports (the terms of trade) and thereby to increase national income at the expense of another country.¹¹

As in any standard prisoners' dilemma, each player can choose between two moves,

¹¹Grossman and Helpman (1995) and Bagwell and Staiger (1999) have extended Johnson (1953-1954)'s framework to settings where governments have political economy motives for trade policy beyond the usual terms of trade motives.

either “cooperate” or “defect”, and failure to cooperate reduces the welfare of the two parties. The payoffs of the game are given in Table 1. Each player gains when both cooperate, but if only one of them cooperates, the defecting player gains more. If both defect, both lose (or gain very little) but not as much as the “cheated” cooperator whose cooperation is not returned. This implies that the following inequalities must hold: $\Pi^D > \Pi^C > \Pi^N > \Pi^P$.

Table 1: Prisoners’ Dilemma

		A	
		C	D
B	C	(Π^C, Π^C)	(Π^P, Π^D)
	D	(Π^D, Π^P)	(Π^N, Π^N)

In particular, we shall assume that trade international relations are a pure PD. This implies that universal cooperation is jointly efficient, so that in a symmetric game players do better by cooperating on every round than they would do by “taking turns”—you cooperate while I defect and then I cooperate while you defect—i.e. $2\Pi^C > \Pi^D + \Pi^P$.

The model is thus a standard two-person repeated PD game with the exception that the actual players at each date are the active leaders of their organizations. Moreover, following the literature of OLG repeated games, we assume that agents of different organizations belong to different generations, i.e. their mandates do not coincide (see Crémer, 1986; Salant, 1991; Kandori, 1992; Smith, 1992). Indeed, in many real world situations agents’ mandates are *staggered*, so that an individual in one organization may face different generations of another organization. For example, there is usually no single date at which there is a complete turnover of the leadership in all countries and each policymaker normally overlaps with different generations of policymakers from other countries.¹² As it will become clear later in the discussion, some of the results of our analysis will rely

¹²For example, US President Bill Clinton overlapped with both UK Prime Ministers John Major and Tony Blair, while Prime Minister Tony Blair overlapped with President Clinton and President George W. Bush. Another example of an organization run by overlapping generations of agents is provided by the United States Senate: senators are elected for six-year terms in even-numbered years; the terms are staggered so that the terms of approximately one third of all Senators expire every two years; thus, approximately 30-36 Senate seats are up for re-election every two years, with no limit on the number

crucially on the overlapping nature of the agents' life spans, while others would still hold if election dates were to coincide across countries.

For simplicity, let us focus on a scenario in which each player's term lasts $T = 2$ periods. When terms last two periods and do not coincide, there will be only one period of overlap; this implies that at any point in time one player will be "young" and the other will be "old". This term structure is described in Figure 1 below, in which $(A, 1)$ represents the policymaker of country A who is in office starting at period 1. This means that during her mandate in periods 1 and 2 she will face both an "old" and a "young" policymaker from the other organization, $(B, 0)$ and $(B, 2)$ respectively.

Figure 1: Policymakers with Two-Period Mandates and One-Period Overlaps

	Time							
Policymakers	...	1	2	3	4	5	6	...
A	...	$(A, 1)$	$(A, 1)$	$(A, 3)$	$(A, 3)$	$(A, 5)$	$(A, 5)$...
B	...	$(B, 0)$	$(B, 2)$	$(B, 2)$	$(B, 4)$	$(B, 4)$	$(B, 6)$...

Following the standard literature on OLG repeated games, we assume that each agents's utility is limited to the events during her life span. Therefore, a policymaker's payoff is defined as the sum of the payoffs achieved by her country while she is in office.¹³ We thus assume that the agents do not care about their organization's payoffs after they have left office. Notice, however, that the main results of our analysis still hold if we relax this assumption, as long as the weight policymakers attach to their countries' payoffs after

of times a person may be re-elected. See Muthoo and Shepsle (2004) and Shepsle, Dickson and Van Houweling (2003) for an analysis of re-election incentives in the context of the US Senate.

¹³This is equivalent to normalizing the payoff of an agent who is not in power to be zero. Note that Π^N represents the difference between the payoff an agent can obtain while in office and the payoff she would get when not in power. It is thus reasonable to assume that $\Pi^N \geq 0$. In the Appendix, we relax the assumption that, while in power, an agent's payoff coincides with that of her organization and consider the case in which policymakers also enjoy private benefits from holding office ("ego rents").

they have left office is low enough.¹⁴

At the end of the second period in office, each policymaker may face “contract renewal”. If a policymaker is not re-elected, she is replaced by a new player who has exactly the same preferences. The purpose of our analysis is to examine the role of re-election incentives on the sustainability of international cooperation. In particular, we want to investigate how allowing policymakers to be re-elected affects the conditions under which a common cooperative choice can be supported as part of a subgame-perfect equilibrium in Nash-reversion punishment strategies, whereby any deviation from C is followed by permanent reversion to the Nash equilibrium of the stage game, in which both policymakers act non-cooperatively.¹⁵

3 Agents with Exogenously Fixed Mandates

Consider the simple OLG structure described in Figure 1. Since each policymaker knows that she is in office for only one two-period term, she will always have incentives to defect in the last period of the mandate, given that she could not be punished for doing so. Therefore, when each agent is in office only for a two-period term, the equilibrium set of the repeated PD game does not include the efficient outcome in which agents act cooperatively over time. If the beginning and the end of the agents’ mandate coincided, the equilibrium set of the repeated game will only include the Nash equilibrium of the stage game and cooperative behavior should never be observed. However, as shown below, some degree of cooperation is achievable, despite the finiteness of the agents’ horizon, when their life spans overlap.

Recall that an agent’s payoff has been defined as the sum of the payoffs of her organization while she is in office. Clearly, in this setting, there is no equilibrium in which a policymaker in the terminal year of her life span will choose to cooperate with the other

¹⁴Our modeling of policymakers’ payoff is in line with the existing benchmark models used in the literature on OLG repeated games (for the case of fixed mandates) and in the literature on self-enforcing international agreements (for the case of infinite mandates) and thus makes it easier to compare the different scenarios. Introducing more detailed payoff functions for policymakers would lead to more realism but would make it harder to disentangle the effect on cooperation of re-election incentives from the effects of the specific modeling choices of policymakers’ payoffs.

¹⁵In focusing on grim trigger strategies, we follow, among others, Bagwell and Staiger (1997), Maggi (1999) and Ederington (2001).

country. The question, therefore, is whether or not there is some equilibrium in which a “young” policymaker chooses C .

In what follows, we shall focus on a scenario in which to play C when young and play D when old yields a higher payoff than playing D all the time, i.e. $\Pi^P + \Pi^D > 2\Pi^N$.¹⁶ A hypothetical example of a PD in which this assumption holds is given by Table 2 below.

Table 2: Prisoners’ Dilemma (Hypothetical Countries’ Payoffs)

		A	
		C	D
B	C	(6, 6)	(0, 9)
	D	(9, 0)	(4, 4)

If individuals observe and remember everything that happened in the past,¹⁷ we can show that there is a subgame-perfect equilibrium in which everyone cooperates during the first period in office. The outcome path of this equilibrium is illustrated in Figure 2. Along this equilibrium path, agent is rewarded with a “bonus” or punished when “old”, depending on her performance when “young”.

To play C when young and play D when old is a subgame-perfect equilibrium outcome when any deviation from equilibrium is punished by reversion to the static Nash equilibrium. For example, if an agent in Organization A deviates when young, she is punished by the next person in Organization B , who switches her action from C to D . With full memory, the punisher is identified as a “police person”, who will not be punished by the next agent in Organization A ; instead, play reverts to the original equilibrium path.¹⁸ It follows that under this strategy profile no policymaker has incentives not to punish a defector, since playing D is better than playing C when young, and no subsequent

¹⁶This is typically the case in most examples of prisoners’ dilemma in trade (e.g. Krugman and Obstfeld, 2005). We discuss below how the results presented in this section would change in a scenario in which the PD payoffs are such that $\Pi^P + \Pi^D < 2\Pi^N$.

¹⁷We assume that the history of play is either perfectly observed or costlessly verified by all the players. See Bhaskar (1998) and Lagunoff and Matsui (2003) for an analysis of the role of memory and communication in games between ongoing organizations.

¹⁸Notice that along this equilibrium path, each country can attain an average (per-term) payoff of $\Pi^P + \Pi^D$, which is above the average non-cooperative payoff of $2\Pi^N$ they would obtain if $\delta < \delta_F$, but below the average payoff of Π^C that would achieve by cooperating over time.

Figure 2: Cyclical Equilibrium Path

Policymakers and Actions	Time							
	...	1	2	3	4	5	6	...
A	...	(A, 1)	(A, 1)	(A, 3)	(A, 3)	(A, 5)	(A, 5)	...
	...	C	D	C	D	C	D	...
B	...	(B, 0)	(B, 2)	(B, 2)	(B, 4)	(B, 4)	(B, 6)	...
	...	D	C	D	C	D	C	...

punishment is imposed when old.

We denote with δ the factor by which policymakers discount future payoffs. For a policymaker not to have incentives to deviate from C to D when young, the following condition must hold:

$$\Pi^N + \delta\Pi^N \leq \Pi^P + \delta\Pi^D. \quad (1)$$

A necessary and sufficient condition for this outcome to be achieved is that players are sufficiently patient, i.e. that the discount factor exceeds the following critical value:

$$\delta_F = \frac{\Pi^N - \Pi^P}{\Pi^D - \Pi^N}. \quad (2)$$

We can thus state the following result:

Proposition 1 *In the presence of term limits, if policymakers have overlapping mandates and are patient enough, the best sustainable equilibrium is one in which they cooperate when “young” and defect when “old”.*

Notice that, as in standard infinitely-repeated games, in infinitely-repeated OLG games there are multiple equilibria. Therefore, the equilibrium described by Proposition (1) is only one of the possible equilibria. However, it could be argued that, if the discount factor exceeds δ_F , the agents will realize that this equilibrium is in their own interest and that it is reasonable to assume that they will coordinate on it.

Therefore, when policymakers have exogenously-fixed life spans and their discount factor is high enough, we should expect non-stationary trade policy patterns. In particular, policymakers should set higher trade barriers toward the end of their mandates. Looking at the example of Table 2 above, we can see that the critical degree of patience which allows policymakers with non-renewable mandates to sustain the cyclical cooperative equilibrium described in Figure 2 is equal to $\delta_F = 0.8$.

Obviously, Proposition (1) is only valid in a scenario like the one described by Table 2 above, in which $\Pi^P + \Pi^D > 2\Pi^N$. If this assumption does not hold, the best sustainable equilibrium of the repeated game when agents face term limits is the Nash equilibrium of the stage game. In this case, with exogenously-fixed mandates of two periods, cooperative behavior should never be observed and we should expect countries to be in a trade war over time.

Notice that our cyclical prediction for the patterns of trade cooperation when policymakers are subject to term limits is in line with the results obtained by the literature on OLG repeated games. For example, Crémer (1986) considers the internal organization of a firm in which workers, in each period of their lives, can choose to work or shirk. He shows that it is possible that all players, except those in the last period of life, exert effort even though exerting no effort is a dominant strategy in the one-shot game. In this equilibrium, young players work hard and enjoy the fruit of their labor later in life. Old agents (“retirees”) are not expected to work hard but do gain from the labors of the young.

Interestingly, in our repeated prisoner’s dilemma setup, it is the very existence of term limits that gives rise to policy cycles. Notice that this is exactly the opposite of what is predicted by the literature on political business cycles, according to which term limits should eliminate policy cycles (e.g. Rogoff, 1990).

It should also be stressed that the cyclical nature of the trade policy patterns in the presence of term limits would be attenuated if we were to extend the length of the agents’ mandate and of their overlaps. Indeed, the theoretical literature on OLG repeated games shows that, if the stage game is repeatedly played by overlapping generations of finitely-lived players, any payoff stream that exceeds individually rational payoffs is sustainable as a subgame-perfect equilibrium as long as (i) individuals are patient and live long enough, and (ii) the length of the overlaps between individuals is long enough.¹⁹ More station-

¹⁹Folk-theorem results for OLG repeated games have been proved by Salant (1991), Kandori (1992) and Smith (1992). See Benoit and Krishna (1999) for a review of the literature on folk theorems in repeated

ary policy patterns should also be expected if political parties—rather than individual policymakers—were the relevant decision-makers in international negotiations.²⁰

4 Agents with Infinite Mandates

After examining the case in which there is no possibility of contract renewal, in the next three sections we shall consider scenarios in which agents can be re-elected. Allowing for re-election implies that—unlike in the case of term limits—policymakers can now be punished for defecting at the end of their term in office. Therefore, as long as policymakers are patient enough, they will be able to sustain the efficient cooperative outcome over time, thus obtaining a payoff of Π^C in each period. It follows that the best sustainable equilibrium when policymakers can be re-elected Pareto dominates the best sustainable equilibrium in the case of term limits. We can thus state the following result:

Proposition 2 *Allowing policymakers to be re-elected makes international cooperation sustainable over time when it would not be otherwise.*

In this section, we will focus on case in which policymakers share the same infinite horizon as their countries. This is the benchmark case of the literature on self-enforcing international agreements and is equivalent to a situation in which policymakers hold office forever, i.e. their mandates are automatically renewed. In this framework, we shall examine how, in the absence of an international authority able to directly punish violations, international cooperation between sovereign nations can be constructed so that each government prefers to comply with the agreement rather than deviate.

The value of sustaining cooperation for a policymaker who stays in power forever can be written as

$$V_I^C \equiv V(\Pi^C, \delta) = \frac{\Pi^C}{1 - \delta}, \quad (3)$$

where the subscript I refers to the infinite horizon of the agents. The value of reverting to a trade war is instead given by

$$V_I^N \equiv V(\Pi^N, \delta) = \frac{\Pi^N}{1 - \delta}. \quad (4)$$

games.

²⁰Alesina and Spears (1988) model political parties as sequences of overlapping generations of candidates, each facing finite decision horizons and show that inter-generational transfers within a party can resolve or mitigate the conflict of interest between an individual policymaker and her party.

A defection from cooperation at any point in time yields one-period deviation gains equal to $\Pi^D - \Pi^C$ but leads to reversion to the non-cooperative payoffs equilibrium Π^N forever after. The punishment associated with Nash reversion can thus be written as

$$\Omega_I \equiv \Omega(\Pi^C, \Pi^N, \delta) = V_I^C - V_I^N. \quad (5)$$

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

$$\Pi^D - \Pi^C \leq \delta \Omega_I. \quad (6)$$

It follows that when policymakers are in power forever, they will be able to sustain international cooperation over time as long as their discount factor exceeds the following critical value:²¹

$$\delta_I = \frac{\Pi^D - \Pi^C}{\Pi^D - \Pi^N}. \quad (7)$$

This critical discount factor, which is graphically determined in Figure 3, represents a measure of the difficulty to sustain international cooperation: the lower is δ_I , the less weight policymakers need to attach to future periods for the efficient cooperative equilibrium to be sustainable by threat of Nash reversion. In the example of Table 2 above, the critical level of the discount factor is equal to $\delta_I = 0.6$.

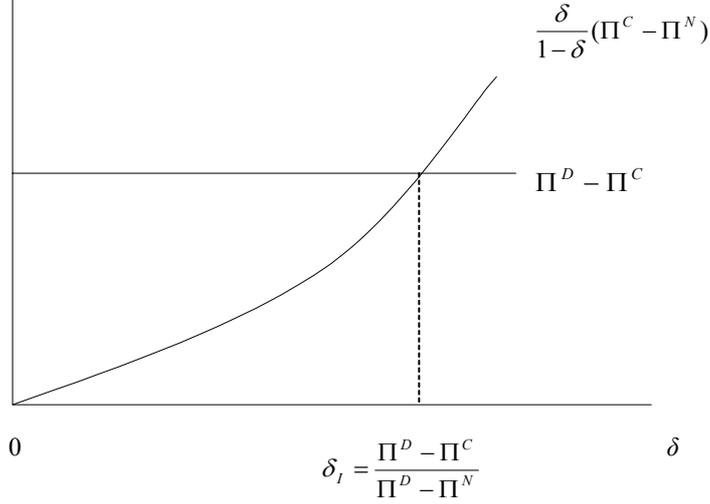
In terms of trade policy predictions, in the case of policymakers who stay in power forever, we should observe stationary patterns of cooperation. In particular, when countries are symmetric and policymakers are patient enough, tariffs should be set close to the optimal zero level, so we should observe free trade over time. Notice that such prediction is independent of the OLG assumption of our theoretical model, since the timing of the elections does not affect the incentive constraints of the policymakers when their mandates are automatically renewed.

5 Agents with Renewable Mandates

One of the main features of representative democracies is periodic re-elections. At the end of each term voters have the opportunity to reward the incumbent politician with re-

²¹Alternatively, had we modeled trade relations in a continuum setting, we could have solved for the lowest possible tariffs that satisfy the incentive compatibility constraints for the two countries, for a given discount factor (see Bagwell and Staiger, 1997).

Figure 3: Derivation of δ_I



election or to replace him with a challenger. This ability of voters to hold the incumbent accountable for his policy choices should in turn act as a powerful incentive instrument for politicians to conduct policies that voters reward with re-election.

In the two sections above, we have examined the cases in which re-election is either impossible or certain. In what follows, we shall compare the degree of cooperation that can be attained in these two extreme cases with that achievable when re-election is possible but not certain.

5.1 Exogenous Re-election

Consider first the case in which policymakers face an exogenous re-election probability \bar{p} .

Notice that, compared to the case of section 4, allowing for re-election has a similar effect as adding an additional discount factor that is applied every two periods. Also, it can easily be shown that the punishment for deviating is always more severe in the case of infinitely-lived policymakers (equivalent to $\bar{p} = 1$) than in a scenario in which policymakers can be re-elected with some given probability $\bar{p} < 1$, implying that $\delta_{\bar{p}} > \delta_I$. It follows that

Proposition 3 *It is more difficult to sustain international cooperation when policymakers face an exogenous probability of re-election than when they are automatically re-elected.*

Proof: The punishment for deviation when policymakers face an exogenous re-election probability \bar{p} can be written as

$$\Omega_{\bar{p}}(\Pi_C, \Pi_N, \delta, \bar{p}) = \frac{(1 + \delta)\bar{p}(\Pi^C - \Pi^N)}{1 - \delta^2\bar{p}}. \quad (8)$$

It is straightforward to verify that the above expression increases with \bar{p} , implying that the maximum punishment for a defection is achieved under automatic re-election ($\bar{p} = 1$).

□

Notice that, when policymakers face an exogenous probability of re-election comprised between $\bar{p} = 0$ (exogenously-fixed mandates) and $\bar{p} = 1$ (infinite mandates), we obtain a result “intermediate” between these two extremes: sustaining cooperation over time easier than when re-election is impossible, but harder than in the case in which re-election is certain.

5.2 Endogenous Re-election

Let us now consider the more interesting and realistic scenario in which the chances of re-election depend on the agents’ past performance. Indeed, there is ample empirical evidence showing that the likelihood that a policymaker is re-elected at the end of her mandate depends of the economic benefits she managed to bring to her constituency during her previous term in office.²²

In particular, we shall assume that the re-election probability at period j , $p_j(\Pi_{j-1}, \Pi_j)$, is differentiable and strictly increasing in its two arguments and that voters attach equal importance to the performance in each of the periods (the case of a recency bias in voting is considered in the following section).²³

For a policymaker facing re-election at the end of her mandate, the value of sustaining

²²See, among many others, Fiorina (1981), Besley and Case (1995), Lohmann *et al.*(1997), Lewis-Beck and Stegmaier (2000).

²³The simplest way to model this feature would be to assume that the re-election probability at j is a function of $(\Pi_{j-1} + \Pi_j)$.

cooperation over time can be written as

$$V_R^C \equiv V(\Pi^C, \delta, p^C) = \frac{(1 + \delta)\Pi^C}{1 - \delta^2 p^C}, \quad (9)$$

where $p^C \equiv p(\Pi^C, \Pi^C)$ is the probability of being re-elected when both policymakers have cooperated in the two previous periods. Indefinite reversion to non-cooperation yields a continuation payoff

$$V_R^N \equiv V(\Pi^N, \delta, p^N) = \frac{(1 + \delta)\Pi^N}{1 - \delta^2 p^N}, \quad (10)$$

where $p^N \equiv p(\Pi^N, \Pi^N)$ is the probability of being re-elected during the Nash-reversion punishment phase.

Comparing equations (9)-(10) with equations (3)- (4), we can see that re-election incentives decrease the continuation payoffs of the agents: the value of sustaining cooperation falls from $\frac{\Pi^C}{1-\delta}$ with automatic re-election to $\frac{(1+\delta)\Pi^C}{1-\delta^2 p^C}$ with endogenous re-election; similarly, the value of remaining in the non-cooperative equilibrium decreases from $\frac{\Pi^N}{1-\delta}$ to $\frac{(1+\delta)\Pi^N}{1-\delta^2 p^N}$. Thus, agents whose re-election depends on past performance discount more the future and have shorter expected life spans than agents who are re-elected with certainty. The presumption is that this “more myopic” policymakers will be more likely to cheat on a foreign partner. In what follows, we shall show that this might not be the case and that electoral incentives might actually help to sustain international cooperation. The intuition behind this result is that endogenous re-election leads to *relative* changes in the continuation payoffs of cooperation and noncooperation.

Notice that a deviation in the second period leads both to a higher per-term payoff for the country ($\Pi^C + \Pi^D > \Pi^D + \Pi^N$) as well as a higher probability of re-election for the policymaker ($p(\Pi^C, \Pi^D) > p(\Pi^D, \Pi^N)$). In what follows, we can thus ignore the first-period incentive constraint and focus on second-period constraint.²⁴ The punishment associated with a second-period deviation from cooperation can be written as

$$\Omega_R \equiv \Omega(\Pi^C, \Pi^N, \delta, p^C, p^N, p^D) = p^C V_R^C - p^D V_R^N, \quad (11)$$

²⁴The purpose of this section is to show that re-election incentives can allow to sustain the efficient cooperative equilibrium even when the discount factor is below δ_I . It can easily be shown that for that critical value of the discount factor the value of a defection in the first period is smaller than the value of deviation in the second period since $\Pi^C + \delta_I \Pi^D > \Pi^D + \delta_I \Pi^N$ and $p(\Pi^C, \Pi^D) > p(\Pi^D, \Pi^N)$. Our analysis is thus valid for values of the parameters for which the first-period incentive constraint is not binding. Notice, however, that when the discount factor is low enough, a defection might still occur in the first period.

where $p^D \equiv p(\Pi^C, \Pi^D)$. Notice that the severity of the punishment decreases with p^D and p^N and increases with p^C . A common choice of C can be supported by Nash-reversion punishment strategies as long as the following incentive constraint is satisfied:

$$\Pi^D - \Pi^C \leq \delta\Omega_R, \tag{12}$$

which identifies a critical discount factor δ_R above which the efficient cooperative equilibrium can be sustained under endogenous re-election.²⁵

The assumption of retrospective voting implies that, by defecting at the end of her mandate, a policymaker can increase the payoff of his country during the current mandate; in turn, this entails a better performance and thus higher chances of immediate re-election ($p^D > p^C$). However, cheating on the foreign partner today implies a reversion to a trade war forever after, leading to lower future payoffs and thus lower chances of being re-elected again ($p^C > p^N$).²⁶

Since re-election probabilities have no effect on the short-run deviation gains—which are equal to $\Pi^D - \Pi^C$ as in the previous scenarios—we can focus our analysis on the comparison between the punishment that can be inflicted for cheating on a foreign partner under endogenous re-election (Ω_R in equation (11)) and under automatic re-election (Ω_I in equation (5) above). In the remaining of this section, we shall show that the former can be more severe than the latter, implying that re-election incentives can help to discipline policymakers.

When the likelihood of policymakers' re-election depends on their past performance, a deviation from cooperation generates two new effects which are not present when re-election occurs with certainty. On the one hand, introducing re-election incentives gives rise to a short-term “re-election boost” effect, since a deviation in the last period of a policymaker's mandate increases not only her flow payoff, but also her probability of immediate re-election. This effect decreases the punishment for defecting, thus making cooperation less appealing. On the other hand, endogenous re-election lowers the probability

²⁵Notice that, as in case of automatic re-election considered in Section 4, the electoral calendars of the two countries will not affect the sustainability of the efficient cooperative equilibrium. This implies that, even if re-election dates were to coincide across the two countries, the critical discount factor under endogenous re-election would still be given by δ_R .

²⁶Under the alternative hypothesis that voters are forward looking, we would expect the ranking of the probabilities to be different—with the probability of re-election p^C being higher than both p^D and p^N . In the Appendix, we show that the results presented in this section still hold if both rational voters and lobby groups determine the probability of re-election.

of holding office in the future, decreasing the expected life span of politicians. As shown below, this can generate a “re-election penalty” effect, which increases the punishment for cheating on a foreign partner, thus helping to sustain international cooperation.

To see whether re-election increases or decreases the long-term punishment of defecting, we must compare the relative changes in the continuation payoffs. We can show that, if p^N is low enough compared to p^C , the long-term consequences of a deviation will be worse for policymakers whose renewal depends on their past performance than for policymakers who are automatically re-elected. In particular, we can solve for the critical re-election probability $\tilde{p}^N(p^C, \Pi^C, \Pi^N, \delta)$ below which retrospective voting creates a long-run re-election penalty effect:

$$\tilde{p}^N(p^C, \Pi^C, \Pi^N, \delta) = \frac{\Pi^N - \Pi^C(1 - p^C) - \delta^2 \Pi^N p^C}{\Pi^N - \delta^2(\Pi^C(1 - p^C) + \Pi^N p^C)}. \quad (13)$$

It follows that re-election incentives can enhance international cooperation if the long-run re-election penalty effect is positive (i.e. $p^N < \tilde{p}^N(p^C, \Pi^C, \Pi^N, \delta)$) and more than offsets the short-term re-election boost effect.

Proposition 4 *Re-election incentives can act as a discipline device, making it easier to sustain cooperation between policymakers with renewable mandates than between policymakers who are automatically re-elected.*

Proof: A sufficient condition for this result to hold is to have $p^D = 1$, p^C approaching p^D and p^N approaching zero. Notice that this is the scenario which maximizes the punishment under retrospective voting, where the chances of an agent’s re-election increase in the payoff obtained by her organization during the previous two periods mandate. In this limit case, there is no re-election boost effect and the re-election penalty effect is maximized, implying that the punishment from defecting from cooperation is more severe than in the case of automatic re-election:

$$\Omega_R - \Omega_I = \frac{\delta^2(\Pi^N(1 - p^N))}{(1 - \delta)(1 - \delta^2 p^N)} > 0. \quad (14)$$

More generally, we can look at the relative size of the re-election boost and Re-election penalty effects for which Proposition 4 is satisfied. To do so, let us set $p^D = 1$ and $\delta = \delta_I$ as in the infinitely-lived case; by applying the implicit function theorem to (12), we can then find the extent to which p^N must decrease (i.e. the re-election punishment must increase) when p^C decreases (i.e. the re-election boost increases) so as to keep the

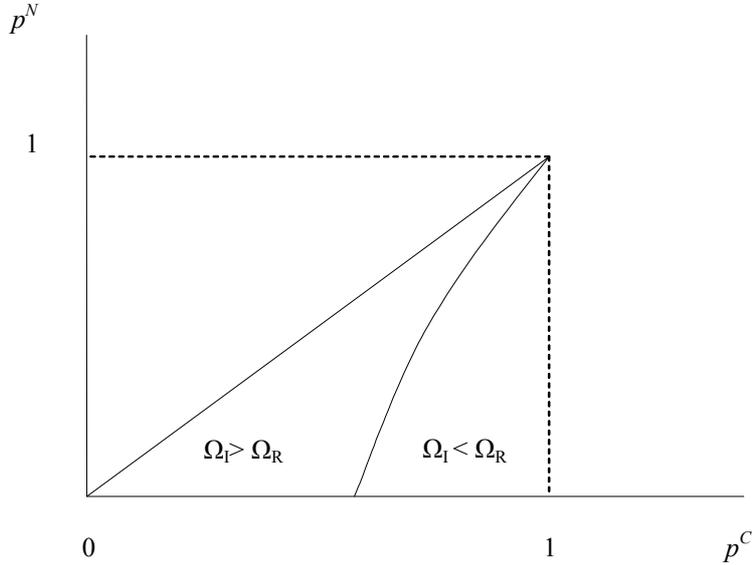
incentives constraint satisfied:

$$\frac{dp^N}{dp^C} = \frac{\Pi^C(\delta_I^2 p^N - 1)^2}{\delta_I^2 \Pi^N (\delta_I p^C - 1)^2} > 0. \quad (15)$$

Expression (15) implicitly defines the locus of points $p^{\tilde{N}}(p^C, \delta_I)$ for which the re-election boost and the re-election penalty effects exactly offset each other and thus the critical discount factor is the same as in the case of infinitely-lived policymakers. This implies that electoral incentives can play a disciplining role on policymakers and thus foster international cooperation whenever $p^N < p^{\tilde{N}}(p^C, \delta_I)$. \square

Notice that re-election can only discipline policymakers if they have something to lose from being fired compared to remaining in office in the non-cooperative equilibrium. Therefore, given that we have normalized the payoff of not being on office to zero, for Proposition 4 to hold, we must have $\Pi^N > 0$. In the Appendix, we shall show that, even if Π^N is equal to zero, re-election can still discipline policymakers as long as they enjoy some private benefits from being in office.

Figure 4: Incentive Constraints under Automatic and Endogenous Re-election



\square

Figure 4 depicts the incentive constraints for the case of automatic re-election and for the case of endogenous re-election. The automatic re-election case is represented by the forty-five degree line, along which $p^D = p^C = p^N = 1$, while the endogenous-horizon case is captured by the curve $\tilde{p}^N(p^C, \delta_I)$ on the right, as defined above. The area in between the curves represents scenarios in which automatic renewal of the mandate is better, while the area to the left of the $\tilde{p}^N(p^C, \delta_I)$ locus captures scenarios under which endogenous re-election is better.

In terms of trade policy predictions, the analysis presented in this section suggests that, when re-election is endogenously determined, we should observe stationary patterns of cooperation. In particular, for high enough discount factors, tariffs should be close to zero. Notice that this is the same empirical prediction as in the case of infinitely-lived policymakers considered in Section 4. However, under the scenario described in Proposition 4 in which re-election incentives increase the punishment for cheating on a foreign partner, we should expect policymakers whose re-election depends on past performance to set lower trade barriers than policymakers who are re-elected with certainty.

6 Recency Bias in Voting

In many cases, voters behave according to the so-called “what have you done for me lately?” principle (Muthoo and Shepsle, 2004), displaying a recency bias in their appraisal of politicians’ performance. This implies that the chances that a policymaker will be renewed in her mandate depends crucially on her *recent* performance rather than on her *overall* past performance.²⁷ Many studies have found evidence of recency bias in national elections in the United States (e.g. Lewis-Beck and Stegmaier, 2000, and Eisenberg and Ketcham, 2004) and in other countries (e.g. Lohman, Brady, and Rivers, 1997). Recency bias can also be observed in a scenario with fully rational voters that learn over time about the competency of politicians. If information is revealed over time, it is then optimal for voters to react to recent information. See Rogoff and Siebert (1988) for a model along those lines. This section considers the implications of the existence of a recency bias on the sustainability of international cooperation. We show that this voting distortion lessens

²⁷In behavioral economics, recency effect is a cognitive bias that results from disproportionate salience of recent stimuli or observations, which is often attributed to limited memory. If time erodes memories, then politicians should release newsworthy items, referred to as successes or good news, close to the re-election date (e.g. Sarafidis, 2004).

the disciplining effect of electoral incentives and might even provide a rationale for the introduction of terms limits.

Consider again the simple setup in which mandates last $T = 2$ periods. In this scenario, the existence of a recency bias implies that voters attach more importance to second-period events than to first-period events when deciding whether to re-elect an incumbent. In particular, we focus on the most extreme case of recency bias, in which the probability of re-election depends only on the second-period's performance, i.e. $p_j(\Pi_j)$. Then, if policymakers cooperate during both the first and second period of their mandates, they obtain the following continuation payoff:

$$V^C(\delta, \Pi^C, p(\Pi^C)) = \frac{\Pi^C(1 + \delta)}{1 - \delta^2 p(\Pi^C)}. \quad (16)$$

However, under recency bias, sustaining international cooperation over time—the efficient equilibrium from the perspective of the countries—might not be the best equilibrium from the point of view of policymakers. To verify this, consider the alternative equilibrium in which the two policymakers collude to increase their chances of re-election, by playing C in the first period and D just before re-election. This yields them

$$V^D(\Pi^D, \Pi^P, \delta, p(\Pi^D)) = \frac{\Pi^P + \delta\Pi^D}{1 - \delta^2 p(\Pi^D)}. \quad (17)$$

Notice that the presence of a strong recency bias reinforces the short-term re-election boost effect, since the difference $p(\Pi^D) - p(\Pi^C)$ is larger than the difference $p(\Pi^C, \Pi^D) - p(\Pi^C, \Pi^C)$. This result follows immediately from the comparison between (16) and (17):

Proposition 5 *A recency bias in voting can lead policymakers to collude in order to get re-elected, at the expense of cooperation between their countries.*

Proof: Whenever $V^D(\Pi^D, \Pi^P, \delta, p(\Pi^D)) > V^C(\delta, \Pi^C, p(\Pi^C))$, policymakers will have incentives to collude to get re-elected. It is straightforward to verify that this condition will be satisfied if and only if

$$p(\Pi^D) > p(\hat{\Pi}^D) \left(\Pi^C, \Pi^D, \Pi^P, \delta, p(\Pi^D) \right) = \frac{(1 + \delta)\Pi^C + (\Pi^P + \delta\Pi^D)(\delta^2 p(\Pi^C) - 1)}{\delta^2(1 + \delta)\Pi^C}. \quad (18)$$

Condition (18) defines situations in which policymakers are willing to accommodate a defection in the first period—since being cheated upon and obtaining a payoff of Π_P when young does not affect their re-election probability when old—in exchange for being able to

attain a defection payoff Π^D in the second period—since this maximizes their re-election chances.²⁸ \square

Therefore, if voting is strongly biased in favor of recent performance, re-election incentives are less effective in disciplining policymakers. The intuition behind this result is that this distortion in the voting behavior allows policymakers to trade political concessions across different time periods.

The analysis is reminiscent of Shepsle and Muthoo (2004). In their paper, they show that US senators can allocate bargaining power among themselves in order to maximize their re-election probabilities. A recency bias can lead to a situation in which senators facing re-election get generous distributive benefits for their constituency. The main focus of their analysis is to show how the allocation of agenda-setting power can change the payoffs of senators. Our focus is different since we consider policymakers belonging to different organizations. In particular, the equilibrium that is the best for the policymakers in terms of re-election is not optimal from the point of view of their organizations. This comes from the fact that collusion between policymakers is done at the expense of international cooperation, while collusion between senators has only distributive consequences.

Notice that in the simple case in which $T = 2$ collusion between policymakers gives rise to the same policy cycle described by Figure 2 above for the case of term limits, in which policymakers play C in the first period of their mandate and D in the second period. However, in the two cases policymakers have opposite reasons to play the same equilibrium strategies: if their mandates are non-renewable, they defect in the last period because they cannot be re-elected; if instead their life spans are endogenously determined and voting exhibits a strong recency bias, they defect in the last period precisely because they want to maximize their chances of re-election.

Our analysis of the simple case in which mandates last two periods shows that endogenous re-election in the presence of a recency bias can be as bad for international cooperation as term limits. Notice, however, that if we extend the length of the mandates to $T > 2$ we can easily find situations in which the introduction of term limits might

²⁸For example, in the PD game in which countries' payoffs are given by Table 2 above, policymakers will have incentives to collude to get re-elected only if the re-election probability associated with a second-period defection is

$$p(\hat{\Pi}^D)(p(\Pi^C)) = \frac{6 - 4\delta + 9\delta^3 p(\Pi^C)}{6\delta^2(1 + \delta)}.$$

actually allow to achieve more international cooperation.

Proposition 6 *In the presence of a strong recency bias, the introduction of term limits can eliminate policymakers' incentives to collude to get re-elected and allow to sustain more cooperation between their countries.*

Proof: Consider the following example, in which mandates last for $T = 4$ periods, with two-period overlaps. This term structure is captured by Figure 5 below.

Figure 5: Policymakers with Four-Period Mandates with Two-Period Overlaps

		Time							
Policymakers	...	1	2	3	4	5	6	...	
A	...	(A, 1)	(A, 1)	(A, 1)	(A, 1)	(A, 5)	(A, 5)	...	
B	...	(B, -1)	(B, -1)	(B, 3)	(B, 3)	(B, 3)	(B, 3)	...	

Let us assume that the re-election probability depends only on the performance of a policymaker over the last two periods of her mandate, i.e. $p_j = p(\Pi_{j-1}, \Pi_j)$. In this scenario, we can show that, if policymakers are patient enough (i.e. δ approaching unity), they might have incentives to collude by playing C during the first two periods and D over the last two periods. Along this equilibrium, they will obtain a per-term payoff equal to

$$V^{DD}(\Pi^D, \Pi^P, p(\Pi^D, \Pi^D)) = \frac{2(\Pi^D + \Pi^P)}{1 - p(\Pi^D, \Pi^D)}. \quad (19)$$

This must be compared with what policymakers could achieve by sustaining cooperation over time, i.e. by playing C in all four periods of their mandates:

$$V^{CC}(\Pi^C, p(\Pi^C, \Pi^C)) = \frac{4\Pi^C}{1 - p(\Pi^C, \Pi^C)}, \quad (20)$$

and with what they could attain by deviating in the last period only:

$$V^{CD}(\Pi^C, \Pi^D, \Pi^P, p(\Pi^C, \Pi^C)) = \frac{2\Pi^C + \Pi^D + \Pi^P}{1 - p(\Pi^C, \Pi^D)}. \quad (21)$$

It is straightforward to verify that, if the chances of re-election when obtaining a payoff of Π^D in the last two periods are much higher than those associated with obtaining $2\Pi^C$ or $\Pi^C + \Pi^D$, then policymakers will gain by colluding.²⁹ From the point of view of the countries, the collusive equilibrium yields a per-term payoff of $2\Pi^P + 2\Pi^C$. Notice that is not only lower than the payoff that they could attain if voting did not suffer from a recency bias ($4\Pi^C$), but also than the payoff they could achieve if mandates were non-renewable ($2\Pi^C + \Pi^D + \Pi^P$). \square

The analysis presented in this section suggests that, if voters display a strong recency bias in their appraisal of politicians' performance, we should expect policymakers of different countries to collude, trading political concessions across different time periods. In particular, they should behave cooperatively (i.e. set lower trade barriers) at the beginning of their mandate and defect (i.e. set higher trade barriers) when close to re-election.

7 Conclusions

In this paper we have examined the impact of electoral incentives on the sustainability of cooperation between two infinitely-lived organizations (countries) that are run by agents (policymakers) with finite but potentially renewable mandates. Our analysis shows that agents subject to endogenous re-election have shorter expected life spans than agents whose renewal occurs with certainty. However, re-election incentives can act as a discipline device, strengthening the severity of the punishment for cheating on a foreign partner. Therefore “more myopic” policymakers might be less likely to defect from internationally agreed-upon policies.

Our results suggest that both the degree of international cooperation sustainable between countries and the nature of the policy patterns—stationary or cyclical—should depend crucially on two domestic political features: whether policymakers are re-electable or subject to term limits; and the way voters evaluate the past performance of incumbents when deciding whether or not to reelect them.

In terms of trade policy predictions, we should expect more stable patterns when policymakers are re-electable and voting does not exhibit a strong recency bias; more

²⁹For example, when the payoff structure of the PD game is described by Table 2 above, policymakers will play C during the first two periods and D over the last two periods if $p(\Pi^D, \Pi^D) > \frac{1}{4}(1 + 3p(\Pi^C, \Pi^C))$ and $p(\Pi^D, \Pi^D) > \frac{1}{7}(1 + 6p(\Pi^C, \Pi^D))$.

fluctuations—with lower trade barriers at the beginning of a mandate and higher barriers at the end—should be observed instead if policymakers are subject to term limits or if they can be re-elected but voting exhibits a strong recency bias. Our analysis thus provide a theoretical explanation for the non-stationary nature of tariffs (e.g. McKeown, 1984; Gallarotti, 1985; Hansen, 1990). To our knowledge, no empirical study has yet investigated the impact of electoral cycles on tariff patterns. However, anecdotal evidence suggests that the cyclical nature of international trade relations might be indeed be related to domestic electoral cycles.

Our analysis contributes to the debate over the desirability of term limits. Common intuition about economic transactions suggests that term limits, although justifiable from a domestic point of view,³⁰ will impede policymakers to engage in long-term relationships and may thus hinder the degree of international cooperation that they can sustain. The analysis carried out in this paper shows that this presumption is only correct if voters do not attach more importance to the recent performance of their policymakers: with endogenous re-election and no recency bias, term limits do reduce the degree of international cooperation that can be achieved; however, if voters attach more importance to recent events in their decision of whether or not to reelect an incumbent, the introduction of term limits, by eliminating policymakers' incentives to collude to get re-elected, might allow to sustain more cooperation.

We conclude by discussing how the theoretical model presented in this paper could be applied to other situations where a game is perpetually repeated by changing casts of players. One possibility would be to investigate other aspects of international relations, such as negotiations between heads of state on transboundary pollution or arm controls, although these policy areas might be less responsive to electoral incentives than trade policy.³¹

³⁰Historically, term limits arose to avoid the excessive power of the executive. In the US, for example, constitutional limits were only put into place in 1951, after Franklin Roosevelt occupied the presidency for four consecutive terms. Before that, an informal two-term tradition existed. This custom goes back to Washington, who set a precedent of not seeking a second re-election. Behind this two-term tradition in the US was the principle of rotation in office, so the government would not depend too much on a particular person, which could hinder the development of strong political institutions.

³¹For example, Gowa (1998) has examined the impact of presidential elections and partisan differences on US foreign military interventions between 1870 and 1992 and finds that the use of force abroad does not respond to the domestic political calendar. However, she stresses that national security might be much less responsive than trade policy to electoral incentives due to the higher risk aversion of policymakers

Alternatively, our theoretical model could be applied to the relationships between different types of ongoing organizations managed by individuals with shorter tenures. For example, one could examine the impact of managers' turnover on the sustainability of collusion between oligopolistic firms. Notice, however, that in the case of managers there are often opportunities for reward after the date at which an individual retires, such as stock options, bonuses or appointments to lucrative or otherwise rewarding posts. These forms of compensation, if related to what happens after retirement, could provide an inducement for retiring players to choose cooperative rather than opportunistic actions.

References

- Alesina, A., and S. Spears. (1988). "An Overlapping Generation Model of Political Competition," *Journal of Public Economics* 37, 359-379.
- Bagwell, K., and R. Staiger (1997). "Multilateral Tariff Cooperation During the Formation of Regional Free Trade Areas," *International Economic Review* 38, 291-319.
- Bagwell, K., and R. Staiger (1999). "An Economic Theory of GATT," *American Economic Review* 89, 215-248.
- Bagwell, K., and R. Staiger (2003). "Protection and the Business Cycle", *Advances in Economic Analysis & Policy*, 3(1), Article 3.
- Benoit J-P, and V. Krishna (1999). "The Folk Theorems for Repeated Games: A Synthesis," *Review of Economic Studies* 59, 81-92.
- Besley, T. and A. Case (1995). "Incumbent Behavior: Vote-Seeking, Tax-Setting, and Yardstick Competition," *American Economic Review* 85, 25-45.
- Bhaskar, V. (1998). "Informational Constraints and the Overlapping Generations Model: Folk and Anti-Folk Theorems," *Review of Economic Studies* 65, 135-149.
- Bohara, A. K. and W. H. Kaempfer (1991). "A Test of Tariff Endogeneity in the United States," *American Economic Review* 81, 952-960.
- Conconi, P., and C. Perroni (2004). "The Economics of S&D Trade Regimes," CEPR Discussion Paper No. 4508.

with respect to the use of force or to the different distributional consequences of the two policies: the returns to tariffs are very concentrated and the costs diffused, while the costs of military intervention are concentrated on a small group and the benefits are more dispersed.

- Crémer, J. (1986). "Cooperation in Ongoing Organizations," *Quarterly Journal of Economics* 101, 33-49.
- Ederington, J. (2001). "International Coordination of Trade and Domestic Policies," *American Economic Review* 91, 1580-1593.
- Eisenberg, D., and J. Ketcham (2004). "Economic Voting in U.S. Presidential Elections: Who Blames Whom for What," *Topics in Economic Analysis & Policy* 4, Article 19.
- Fair, R. C. (1978). "The Effect of Economic Events on Votes for President," *The Review of Economics and Statistics* 60, 159-173.
- Fiorina, M. P. (1981). *Retrospective Voting in American National Elections*. New Haven, Yale University Press.
- Gallarotti, M. (1985). "Toward a Business-Cycle Model of Tariffs," *International Organization* 39, 155-187.
- Gowa, G. (1998). "Politics at the Water's Edge: Parties, Voters, and the Use of Force Abroad," *International Organization* 52, 307-24.
- Grilli, E. (1988). "Macroeconomic Determinants of Trade Protection," mimeo.
- Grossman, G., and E. Helpman (1994). "Protection for Sale," *American Economic Review* 84, 833-850.
- Grossman, G., and E. Helpman (1995). "Trade Wars and Trade Talks," *Journal of Political Economy* 103, 675-708.
- Grossman, G., and E. Helpman (2004). "A Protectionist Bias in Majoritarian Politics," NBER Working Paper No. 11014.
- Hansen, J. M. (1990). "Taxation and the Political Economy of the Tariff," *International Organization* 44, 527-552.
- Johnson, H. (1953-54). "Optimum Tariffs and Retaliation," *Review of Economic Studies* 21, 142-153.
- Kandori, M. (1992). "Repeated Games Played by Overlapping Generations of Players," *Review of Economic Studies* 59, 81-92.
- Krugman, P. and M.e Obstfeld (2005). *International Economics: Theory and Policy*, 7th Edition. Addison-Wesley-Longman.
- List, J. A., and D. M. Sturm (2004). "How Elections Matter: Theory and Evidence from Environmental Policy," NBER Working Paper No. 10609.

- Lagunoff, R., and A. Matsui (2003). "Organizations and Overlapping Generations Games: Memory, Communication, and Altruism," mimeo.
- Lewis-Beck, and M. Stegmaier (2000). "Economic Determinants of Electoral Outcomes," *Annual Review of Political Science* 3, 183-219.
- List, J. A., and D. M. Sturm (2004). "How Elections Matter: Theory and Evidence from Environmental Policy," NBER Working Paper No. 10609.
- Lohmann, S. (1993). "Electoral Cycles and International Policy Cooperation," *European Economic Review* 37, 1373-1391.
- Lohmann, S., D. Brady, and D. Rivers (1997). "Party Identification, Retrospective Voting, and Moderating Elections in a Federal System: West Germany, 1961-1989," *Comparative Political Studies* 30, 420-49.
- Maggi, G. (1999). "The Role of Multilateral Institutions in International Trade Cooperation," *American Economic Review* 89, 190-214.
- McKeown, T. J. (1984). "Firms and Regime Change: Explaining the Demand for Protection," *World Politics* 36, 215-233.
- Muthoo, A., and K. A. Shepsle (2004). "Agenda-Setting Power in Organizations with Overlapping Generations of Players," mimeo.
- Nordhaus, W. D. (1975). "The Political Business Cycle," *Review of Economic Studies* 42, 1969-1990.
- Olson, M. (1965). *The Logic of Collective Action*. Harvard University Press, Cambridge, MA.
- Ornelas, E. (2003). "Rent Dissipation, Political Viability and the Strategic Adoption of Free Trade Agreements," mimeo.
- Putnam, R. (1988). "Diplomacy and Domestic Politics: The Logic of Two Level Games," *International Organization* 42, 427-460.
- Rogoff, K. (1990). "Equilibrium Political Business Cycles," *American Economic Review* 80, 21-36.
- Rogoff, K., and A. Siebert (1988). "Re-elections and Macroeconomic Policy Cycles," *Review of Economic Studies* 55, 1-16.
- Salant, D. (1991). "A Repeated Game with Finitely Lived Overlapping Generations of Players," *Games and Economic Behavior* 3, 244-259.

- Sarafidis, Y. (2004). "What Have You Done for Me Lately? Release of Information and Strategic Manipulation of Memories," mimeo.
- Shesple, K., E. Dickson and R. Van Houweling (2003). "Bargaining in Legislatures with Overlapping Generations of Politicians," mimeo.
- Smith, L. (1992). "Folk Theorems in Overlapping Generations Games," *Games and Economic Behavior* 4, 426-449.
- Tabellini, G. (1990). "Domestic Politics and the International Coordination of Fiscal Policies," *Journal of International Economics* 28, 245-265.

Appendix

In this appendix we consider two extensions to the simple theoretical model presented in our paper. We first show that the results presented in Section 5 under the assumption of retrospective voting still hold in a situation in which re-election probabilities are jointly determined by rational voters and lobby groups. We then look at the implications of introducing some “ego rents” (per-period private benefits from holding office).

Rational Voters and Lobby Groups

In this paper, we have examined the impact of policymakers’ re-election incentives on the sustainability of cooperation between their countries. For this purpose, we have compared the three alternative scenarios in which policymakers’ life spans are exogenously fixed (no re-election possible), infinite (automatic re-election) or endogenously determined (re-election possible but not certain). The results of such a comparison depend crucially on the ranking of the different probabilities of re-election. In the paper, we have focused on the simple and relevant case of retrospective voting, in which re-election probabilities are a function of agents’ past performance; this implies that the higher is a country’s welfare during a policymaker’s mandate, the more likely it is that she will get re-elected, i.e. $p^D > p^C > p^N$. In this section, we sketch out an alternative model of voting which can give rise to the same ranking of probabilities.

Suppose that the population of each country can be divided into rational voters and undecided voters. Assume also that the chances that an incumbent policymaker is re-elected depend both on the preferences of rational voters and on the campaign contributions paid by lobby groups, which influence the preferences of the undecided voters.

Forward looking voters should choose to reelect incumbents who play C and not to reelect incumbents who play D . From the point of view of these voters, we would thus expect the probability of re-election p^C to be higher than both p^D and p^N .³²

³²Notice, however, that the assumption of Nash-reversion punishment strategies implies that, once a defection has occurred, rational voters will be indifferent about whom to elect. Rational voters would have a strict interest in not reelecting an incumbent who has defected only if this led to a change in the patterns of cooperation in the future. This would require that they expect the incumbent’s future performance to be worse than the challenger’s future performance; in turn, in a setup like ours with identical policymakers, this would require that the behavior of the other country’s policymaker depends on the outcome of the elections in the domestic country. This setting could give rise to what many

In each country there exists a group of import-competing producers who can substantially benefit from having high trade barriers. We assume that this group is able to overcome the free-riding problem of collective action described by Olson (1965) and form a lobby group. Consistently with the Grossman and Helpman (1994)'s model, the lobby offers campaign contributions to the incumbent policymaker to try to bend the trade policy outcome in its favor. The protectionist lobby will have an interest in triggering a defection from cooperation and will thus be willing to contribute a positive amount to induce a policymaker to choose D while the other country's policymakers chooses C ; the lobby should instead have no incentive to contribute along the long-run cooperative equilibrium or under Nash reversion. From the point of view of the campaign contributions, we would thus expect the probability of re-election p^D being higher than both p^C and p^N .

As long as campaign contributions are important enough in determining electoral outcomes, the above implies the same ranking of probabilities as in the case of retrospective voting ($p^D > p^C > p^N$) and thus the results presented in Sections 5 and 6 of our paper would still carry through.

The Effect of “Ego Rents”

In the simple OLG model presented in Section 2, we assumed that a policymaker's payoff was the sum of the payoffs achieved by her country while she is in office. We shall now relax this assumption and consider a situation in which policymakers also enjoy “ego rents” equal to R in each period they hold office. Notice that this implies that the policymakers' payoffs are equivalent to their countries' payoffs as depicted in Table 1 increased by a fix constant R .

It can easily be shown that ego rents have no effect on the sustainability of cooperation in the cases of non-renewable and automatically-renewed mandates. However, under endogenous re-election, ego rents do affect the strength of the punishment that follows a

political commentators refer to as “fresh start”, i.e. newly-elected governments benefiting from a stock of goodwill and a period of cooperative behavior from their partners. The analysis of such a model is beyond the scope of the present paper and is left for future research.

Another channel through which rational voters could have an impact on re-election incentives is through credible threats of replacing an incumbent that has started a trade war. The mere threat could be enough to discipline policymakers (in any case, rational voters might only have to move off the equilibrium path). Both the above arguments show that a proper analysis of rational voting would require a more complex model of repeated games between four—rather than of two—active players.

defection. To verify this, notice that the value of cooperation and non-cooperation can respectively be written as

$$V^C(\Pi^C, \delta, p^C, R) = \frac{(1 + \delta)(\Pi^C + R)}{1 - \delta p^C}, \quad (22)$$

and

$$V^N(\Pi^N, \delta, p^N, R) = \frac{(1 + \delta)(\Pi^N + R)}{1 - \delta p^N}. \quad (23)$$

Therefore policymakers whose re-election depends on past performance will be able to sustain cooperation by Nash-reversion punishment strategies as long as the following incentive constraint is satisfied:

$$\Pi^D - \Pi^C \leq \delta \left(p^C V^C(\Pi^C, \delta, p^C, R) - p^D V^N(\Pi^N, \delta, p^N, R) \right). \quad (24)$$

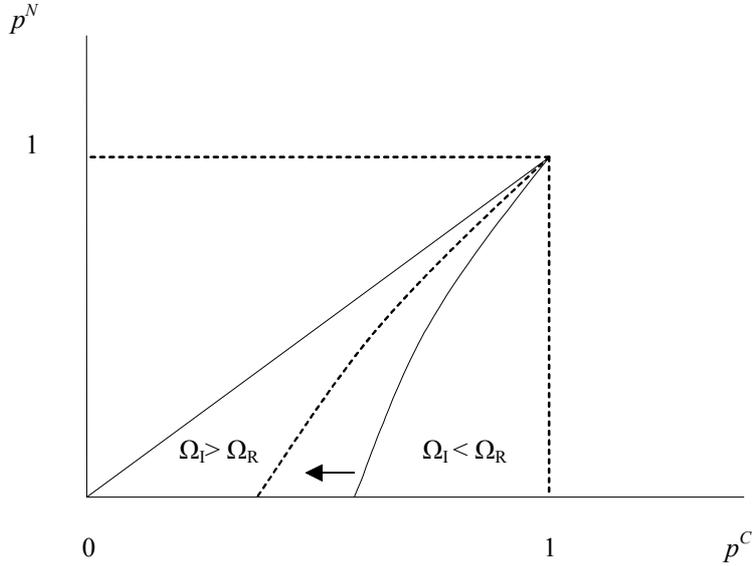
Notice that an increase in R leads to an increase in both (22) and (23). However, it is straightforward to verify that for given re-election probabilities a rise in R increases the value of cooperation $V^C(\Pi^C, \delta, p^C, R)$ by more than it increases the value of non cooperation $V^N(\Pi^N, \delta, p^N, R)$. This implies that the larger are the private benefits enjoyed by policymakers when holding office the stronger is the long-run re-election punishment effect. Therefore introducing fixed per-period private benefits from holding office strengthens the disciplining role of re-election incentives. This implies that more opportunistic policymakers might actually be more likely to stick to international agreements. To verify this, let us fix $p^D = 1$ and $\delta = \delta_I$ as in the infinitely-lived case; by applying the implicit function theorem to (24), we can then find an expression for the relative size of the “re-election boost” and “re-election penalty” effects for which the severity of the punishment under endogenous re-election is the same as in the case of automatic re-election:

$$\frac{dp^N}{dp^C} = \frac{(\Pi^C + R)(\delta_I^2 p^N - 1)^2}{\delta_I^2 (\Pi^N + R)(\delta_I p^C - 1)^2} > 0. \quad (25)$$

Notice that the above expression decreases in R . This implies that when ego rents are more important, a smaller decrease in p^N is needed to compensate for a fall in p^C , so as to guarantee that (24) is satisfied. Therefore, an increase in R leads to a fall in the critical discount factor which allows to sustain cooperation under endogenous re-election.

In Section 5, we looked at the scenario in which $R = 0$ and pointed out that re-election incentives can only discipline policymakers if $\Pi^N > 0$. The analysis presented in

Figure 6: The Effect of Introducing “Ego Rents”



this section shows that, even if $\Pi^N = 0$, endogenous re-election can help to deter defections as long as $R > 0$.³³

Figure 6 above shows that the introduction of per-period ego rents R increases the area for which it is easier to sustain cooperation between agents with endogenously determined life spans than between infinitely-lived agents.

³³Notice that cooperation would still be sustainable if policymakers cared *only* about obtaining “ego rents”. In this case, the threat of losing the per-period rents R would be the only deterrent against a defection and they would choose to cooperate as long as

$$\frac{p^C R}{1 - \delta^2 p^C} \geq \frac{p^D R}{1 - \delta^2 p^N}.$$