Tit-for-tat in Trade Policies: Nothing but a Fest for Vested Interests?

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1. Introduction

In social relationships amongst individuals, that is at the micro-level, tit-for-tat (TFT) has been a well established means to elicit cooperation. Theoretical and experimental work by Rapoport and Chammah (1965) and Axelrod and Hamilton (1981) substantiated their crucial role in governing the life of individuals in communities. Clearly, subsequent research has criticized those studies on a number of accounts. Boyd et al. (2014), for instance, revisited recently the issue of community size; Zaggl (2014), in a meta-study on alternative mechanisms, alludes to the fact that, under particular circumstances, TFT may be outcompeted by other strategies.

Nevertheless, TFT strategies also found their way into international relations and (economic) policy in general, that is, so to say, at the macro-level. Axelrod and Keohane (1985), by presenting a case collection, show how wide a range of applications TFT had in the history of international politics. Trade policy is a case in point. Here, TFT clashes gain momentum whenever the world economy is stricken by economic crises and political dissent. Trade conflicts between the US and China are one example among many: for instance, in September 2009, the U.S., in order to safeguard its industry, imposed an import duty of 35 percent on Chinese made tires; two days thereafter, China accused the U.S. of "dumping" chicken products on the Chinese market, signaling that it might impose duties in response. A month later, China eventually answered by levying a duty of 36 percent on some nylon products from the United States. The same year, in November, the focus of U.S. import restrictions shifted to Chinese-made steel pipe, glossy, magazine-quality paper and several types of salts while, a couple of days later, the trade dispute triggered Chinese import restrictions on U.S. auto parts (The Washington Post, Jan. 4th, 2010).

Most interestingly, tit-for-tat in trade policies not only serves as an informal instrument to induce a particular behavior of the opposite party, it also forms an important constitutional element in the Dispute Settlement Understanding (DSU) of the World Trade Organization (WTO). There, it serves to enforce compliance with (once agreed upon) international rules. With Art. 22.4 of the DSU, it is thus even formally institutionalized in international economic policy (see Bown and Pauwelyn 2010 and Dluhosch and Horgos 2013 for a discussion). The embodiment in the governance of international trade comes on top of the fact that the whole General Agreement

on Tariffs and Trade (GATT) to which the DSU is an annex is build around the principle of reciprocity (with the exception of developing countries and certain kinds of preferential trade agreements).

However, as has been pointed out inter alia by Lawrence (2003) and Kim and Kim (2013), TFT may also carry the potential to actually undermine multilateral trade integration. A particular concern is that it might be exploited by special interests. A wide range of authors from various theoretical schools and different backgrounds are thus reluctant to embrace TFT behavior on the account that it might provide special interests with a new and effective spring board to advance (their own) particular interests. Milner (1992:492), points out that, with vested interests, outcomes might be very different from those predicted by the rational-actors hypothesis implicitely underlying TFT strategies in many theoretical settings, to the effect that, in reality, TFT may either not be within the set of available strategies or fail to sustain cooperation. Guzman (2004:320) warns that, in order to please domestic political constituents, retaliation might be too strong or even based on the mere claim of a violation of the rules of the game in order to "legitimize" protectionist policies. Boudreaux (2011:5) sees a serious downside in the possible encouragement of rent seeking behavior.

This paper explores how domestic interest groups might influence strategies and thus the set of possible outcomes of tit-for-tat in trade policies with a particular focus on the emergence and the evolution of rules and institutions related to trade policy. By parameterizing the leverage of special interests and by tracking the international transmission of their effects, the paper provides a novel perspective on the relationship between special interests and international economic policy. It turns out, that, in evolutionary perspective, tit-for-tat actually tends to widen the set of parameters that sustain a more open trade regime, even in a special-interest ridden world. In emphasizing the role of domestic interest groups the paper shares in the view of the political-economy literature on two-level games in shaping international economic policy (see Putnam 1988, and, with reference to trade, Gawande et al. 2009, Mansfield and Milner 2012, and da Conceição-Heldt 2013). Here, however, we explicitly trail the repercussions as mediated by trade implications of a wide range of possible political-economy constellations in evolutionary

perspective.

From a strictly welfare-theoretical point of view advantageous effects of unilateral trade liberalization may challenge the need for international cooperation in trade policy (Bhagwati & Panagariya 2002). However, political-economy issues raised by domestic interest-groups are known to be quite a game changer, thus illuminating the value added of international institutions, formal and informal, in this field. For political-economy reasons all of trade policy carries a strong element of reciprocity, possibly augmented by terms-of-trade issues (Keohane 1986; Rhodes 1989; Bagwell and Staiger 2010 and 2011).[1] When examining the role of interest groups in the emergence of rules and institutions related to trade, it is important though to dissect two aspects, namely *i*) the stakes interest groups have in certain kinds of policies and *ii*) the political leverage those groups have. Research by Olson (1968) in particular has shown that, when it comes to actual policies, these are two very distinct issues (see also Immergut 1990 for policy examples). In following this distinction, we depart from the protection-for-sale literature as initiated by Grossman and Helpman (1994), which presupposes that the leverage of interest groups primarily depends on the stake of those groups in protection and, via campaign contributions, directly feeds into political decisions. Chaudoin and Urpelainen (2013), although also stressing the ambiguous role of interest groups in either strengthening or dampening international cooperation, base their analysis on the assumption of a single interest group in each country and without tracking the interdependence as transmitted by trade flows, as we do. Same applies to Rönnbäck (2014), who presents case-study evidence according to which the role of interest groups might differ from what their stake suggest (and what is traditionally assumed in the protection-for-sale approach). Having said that, these studies provide an additional argument backing our introduction of a leverage parameter – apart from the stakes interest groups might have. On this account, it is also worth noting that the wider perspective of a parameterization of the leverage of interest groups also takes account of the fact that preference aggregation by political regimes may vary and that neither interest groups nor politicians acting on their behalf

[1] On terms-of-trade driven policies see, e.g., Grossman and Helpman (1995). Note though that terms of trade motives (that is redistributional issues between rather than within countries) are very much in dispute (e.g. Magee and Magee 2008; Ludema and Mayda 2013) and are by no means a necessary nor a sufficient condition for political-economy issues to arise (Maggi and Rodríguez-Clare 2007). For a very different notion of reciprocity, namely related to preferences over trade policies see Hadjiyiannis and İriş (2012).

may be completely rational or have perfect knowledge as regards the implications of policies or even that preferences are invariant. Besides other differences, in particular with respect to the specific question we are examining here, our basic setup differs also from Baldwin (1987), Beshkar (2010) and Horn et al. (2010) by augmenting the analytical trade policy framework by two parameters, stake and leverage, while in several other respects we want to derive results from minimal assumptions. Notably, by focusing on interest group issues, we intend a positive analysis and not a normative analysis, as for instance, Martin and Vergote (2008), who look at retaliation as a first- or second-best policy from a welfare-theoretic perspective. Hence, identifying whether there are strategies that are superior to TFT in attaining and sustaining cooperation in trade liberalization is beyond the scope of this paper.

The paper thus offers insights on two accounts: first, it sheds new light on the TFT controversy in trade policy in general and the dispute settlement within the WTO which includes the threat of TFT in particular. In doing so, we follow Hodgson (2006) and Kasper et al. (2012:35) by employing a wide definition of economic institutions that comprises internal as well as external institutions and that takes account of the fact that TFT is part of non-codified as well as codified trade policy and, in case of the latter, with the enforcement backed by a third party (i.e. the WTO). Second, and on a more general account, it sharpens the argument on the prospects of an evolutionary emergence of institutions (or rules for that matter), as has been sparked by the Hayekian vision of spontaneous order extending from the market to the political level (Hayek 1966:126, 1973). Notwithstanding the critique of the Hayekian concept when considered in the abstract (e.g. Vanberg 1986; Hodgson 1991, Skarbek 2013, and Stringham 2014), our work suggests that examining applications in addition to the abstract theoretical notion as formulated by Hayek may provide value added in the discussion on the prospects (and limits) of an evolutionary approach to institutions.

The paper proceeds in three steps. The next step, Section 2, outlines the basics of supply and demand in two countries, thus sketching out the (potential) international interdependence as transmitted via trade flows. Section 3 displays the rationale for protection as perceived by politicians in a special interest ridden world with different domestic interests groups having

different stakes in the policy options. In this Section, we focus on two issues in particular: we examine *i*) how the leverage of domestic interests and *ii*) the degree of lack in competitiveness of the import substitution industry may possibly affect strategic decisions in trade policies in a one-shot situation. This Section on the leverage versus the stakes of interest groups serves to identify when a prisoner's dilemma in trade policy arises. Section 4 then takes a closer look at reciprocating trade policies by tracking how trade policies abroad may trigger policy reactions at home and vice versa. Here, we explicitely adopt an evolutionary perspective in the sense of tracing the broader implications beyond "one-shot policies". By drawing on the concept of evolutionary stable strategies as introduced by Maynard Smith (1976), we identify the sub-set of parameters that sustain trade liberalization even in a special interest driven world and in face of TFT threats. The Section closes with a discussion on how TFT fares in a world that is composed of a mass of countries that follow a generally protectionist strategy. Apart from the more realistic assumption concerning the number of countries, this scenario also gives an indication of the prospects of effective multilateralization of institutions when starting from a bi- or plurilateral approach.

2. The Stakes and the Leverage of Interest Groups in Trade Policy

Assume, just for the moment, that there two economies, Home and Foreign, with population in both of them normalized to unity. We will discuss an upscaled version featuring a mass of countries in Section 4. Assume furthermore that, in this world economy of two, there are two goods (good 1 and good 2) that are potentially subject to trade restrictions whereas a third good that serves as numéraire is freely traded. The latter assumption follows the tradition in trade analysis by primarily ensuring that international trade flows are balanced. As such, it will not be considered in more detail. Both goods whose trade is potentially restricted are produced in both of the countries with supply, however, inelastic in order to simplify the analysis. Notice that the kind of trade restriction that is imposed on these goods is of secondary importance. Countries might impose duties on imports, but since other trade restrictions carry a tariff equivalent, it is not necessary to be more specific at this point.

As for trade, we will assume without loss of generality that Home enjoys a comparative advantage in the production of good 2 while Foreign has an advantage in good 1, with supply of both of these export goods inelastic at unity. Qua assumption, Home has thus a comparative disadvantage in good 1 and Foreign in good 2. Simplifying again, the competitive disadvantage can be expressed by parameter $\lambda < 1$ with the disadvantage decreasing as the parameter approaches unity. While measuring the lack in competitiveness λ is thus also an index of the stake import-competing interest groups have in keeping their local markets protected. This supply side ensures that, given the same downward sloping demand curve in Home and Foreign, prices of these goods in autarky are higher the smaller λ and, naturally, also higher than abroad (and so are local rents). Supply (X) in Home and Foreign is thus

$$\begin{aligned} X_1 &= \lambda; \qquad X_1^* = 1 \\ X_2 &= 1; \qquad X_2^* = \lambda \qquad\qquad (\text{with} \quad \lambda < 1) \end{aligned} \tag{1}$$

with subscripts 1 and 2 for good 1 and 2 respectively. We follow common practice in that variables with an asterisk refer to Foreign. With $\lambda < 1$, Home (Foreign) is thus a natural importer of good 1 (2). Because of the inelastic supply and the rents associated therewith, Home's import substitution industry (good 1) has a vested interest in protection while its export industry (good 2) would benefit from having free access to markets abroad. Same applies with respect to Foreign, there, however, with the sign reversed.

Suppose furthermore that demand (D) in any case is a simple downward sloping curve in the price of any of those goods

$$\begin{aligned} D_1(p_1) &= 1 - p_1; \qquad D_1^*(p_1^*) = 1 - p_1^* \\ D_2(p_2) &= 1 - p_2; \qquad D_2^*(p_2^*) = 1 - p_2^* \end{aligned} \tag{2}$$

with p denoting domestic prices, that is, prices including any tariffs or the tariff equivalents of other import restrictions.

With trade, albeit restricted, arbitrage conditions are thus

$$p_1 = p_1^* + \tau; \qquad p_2^* = p_2 + \tau^*$$

with τ, τ^* nominal protection (tariff equivalent) rates in Home and Foreign respectively. Markets for both goods are cleared via trade, implying that supply equals demand for each of them:

$$X_1(\lambda) + X_1^* = D_1(p_1) + D_1^*(p_1^*); \qquad X_2 + X_2^*(\lambda) = D_2(p_2) + D_2^*(p_2^*) \tag{3}$$

The resulting prices depend inter alia on the competitiveness of the import substitution industry as measured by parameter λ, as does the import substitution industries' stake in having their markets protected. The natural coalition partner in the quest for protection is either the government (in case it collects tariff revenue) or all those political groups that receive the equivalence of the tariff revenue in the form of rents. The potential opposition is, as usually, formed by the export industry and the consumers whose real income would be higher because of cheaper imports in case tariffs were removed.

While it might be clear who is the potential winner and who is the potential loser when markets are opened up, it is much less clear how preferences are aggregated in the political process. Much of the theoretical literature on the political economy of trade policy, in particular the "protection for sale literature", assumes that groups try to advance their interest via campaign contributions with the contributions in turn depending on the stake that those groups have in a particular political measure. However, here, we will deviate from this widespread assumption of economizing rent seeking behavior. This is for two reasons: first, the campaign contribution approach very much presupposes a particular (country-specific) political regime. This might, for instance, be a natural approach for the US, but less so for many other countries where parties are to a substantial extent financed out of taxes. And second, it largely neglects the organization of interests.

As for a more general approach, we will assume that preferences are amalgamated into political objective functions V (V^* for Foreign) by means of parameter μ. Hence, parameter μ is a

measure of the leverage of protectionist interests versus free trade interests (that is, the import-substitution industry and the recipients of tariff revenue versus consumers and export industry). However, notwithstanding problems of aggregation, the respective stakes continue to be measured by consumer (CS) and producer surpluses (PS). Consumer surplus is the difference between the maximum willigness to pay and actual market prices. In our case of a linear demand and prices as previously outlined, CS, for example, in the consumption of good 1 in Home is the triangle $c_1 (1 - p_1)/2$ with c_1 actual consumption according to eq.(2), p_1 market price of good 1 and unity the maximum willingness to pay. Because of the assumptions concerning supply, producer surplus PS can be simply proxied by sales revenue, that is $X_1 p_1$. Finally, with imports M, government collects tariff revenue τM_1 (similar in Foreign).[2]

$$\begin{aligned} V = &\quad (1-\mu)(CS_1 + CS_2 + PS_2) + \mu (PS_1 + \tau M_1) \\ V^* = &\quad (1-\mu)(CS_1^* + CS_2^* + PS_1^*) + \mu (PS_2^* + \tau^* M_2^*) \end{aligned} \tag{4}$$

Note that this does not imply that politicians act on behalf of their constituents with complete knowledge of their preferences and foresight as regards the implications of policies. The contrary might be the case: the parameterization with respect to the stakes and the leverage not only covers a wide range of possible ways as to how special interests feed into the political will, it can also be interpreted as a fuzziness with respect to perceptions. With these quite general assumptions concerning the aggregation of interests, we can take a closer look at the incentives (and thus the chances) in sustaining a particular trade regime in the presence of interest groups with stakes λ and political leverage μ.

3. When Does a Prisoner's Dilemma Arise?

We will start out with the main argument that is often advanced in support of formal international institutions such as the WTO in trade policy, namely that otherwise countries would wind up in a prisoner's dilemma from which they cannot free themselves as no one country (or policy maker) is ready to take a first move. As alluded to in the introduction, removing barriers to

[2] See the Appendix for a complete derivation of all results as well as intermediate steps.

trade while others keep their markets protected, so the argument, would imply a worsening of the terms-of-trade respectively a loss of political support. Given a situation like this, countries are thus stuck with protectionist policies, and, one might add, with world output smaller than otherwise.

However, a scenario thus bleak need not materialize. Consider the ranking of trade policy strategies in a "one-shot game" of two policy makers (from Home and Foreign) with preferences V, V^* driven by domestic political support. This constellation is the typical circumstance under which a prisoners' dilemma in trade policies is said to loom large. Figure 1 displays the basic scenario with politically perceived pay offs conditional on policy as indicated by subscripts, that is, for example, $V|_{\tau>0;\tau^*=0}$ in case of an asymmetric protection of Home's import-substitution industry.

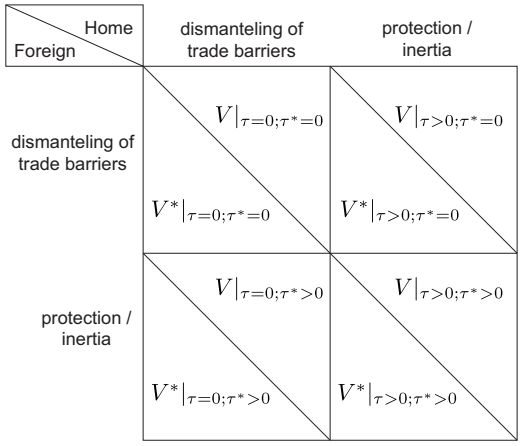

Figure 1. Pay Offs: "One-Shot Trade Policies"

Whether protectionism really prevails nevertheless depends on the two aforementioned parameters in particular: *i*) the international competitiveness of the local industry (as measured by parameter λ) and *ii*) the leverage of domestic interest groups seeking protection (as measured by parameter μ). They are both crucial to the ranking of policies and the sustainability of whole policy regimes. Although domestic interest groups seeking protection have a saying in policy formation and although the chance that Foreign's policy makers might reciprocate does not have a bearing on Home's policy makers' strategy, protectionism need not obtain. Under Nash as-

sumptions, protectionism is perceived a strictly dominant strategy iff $V|_{\tau>0;\tau^*=0} > V|_{\tau=0;\tau^*=0}$ and $V|_{\tau>0;\tau^*>0} > V|_{\tau=0;\tau^*>0}$. In a "pure" prisoner's dilemma (Rapoport and Chammah 1965:34; Kuhn and Moresi 1995:335), cooperation (here: in trade liberalization) yields an outcome that is superior compared to the purely national (protectionist) reasoning thus reflecting the "true dilemma". Henceforth, the situation is perceived as a "pure" prisoner's dilemma when the following ranking obtains: $V|_{\tau>0;\tau^*=0} > V|_{\tau=0;\tau^*=0} > V|_{\tau>0;\tau^*>0} > V|_{\tau=0;\tau^*>0}$ and $2V|_{\tau=0;\tau^*=0} > (V|_{\tau>0;\tau^*=0} + V|_{\tau=0;\tau^*>0})$. Notably, $V|_{\tau>0;\tau^*=0} > V|_{\tau=0;\tau^*=0}$ requires

$$\mu > \frac{3 + 2\lambda - 5\lambda^2}{7 + 2\lambda - 9\lambda^2} \tag{5}$$

thus implying a lower bound on the leverage μ of (protectionist) interest groups (same for $V|_{\tau>0;\tau^*>0} > V|_{\tau=0;\tau^*>0}$). Hence, for any given stake in the protection of local markets λ, those interest groups must have a sufficiently high political leverage μ. The pivotal leverage increases in the competitiveness λ of the import-substitution industry: the more competitive the industry, the higher must be the leverage in order to overcome the smaller stakes of their clientele in a protectionist regime (with $\partial\mu/\partial\lambda = 8\,(1-\lambda)^2 / \left(7 + 2\lambda - 9\lambda^2\right)^2 > 0$ for all values of $\lambda < 1$)

The "true dilemma", $V|_{\tau=0;\tau^*=0} > V|_{\tau>0;\tau^*>0}$ and $2V|_{\tau=0;\tau^*=0} > (V|_{\tau>0;\tau^*=0} + V|_{\tau=0;\tau^*>0})$, by contrast, requires

$$\mu < \frac{3 - 2\lambda - \lambda^2}{5 - 2\lambda - 3\lambda^2} \tag{6}$$

which yields an upper bound on μ. Mutual trade liberalization (i.e. cooperation in trade liberalization) is only perceived to yield superior outcomes iff for any given stake λ the leverage of interest groups on the political perception is not too high. In this case, the condition on the leverage μ is deceasing in the stakes λ: the higher the competitiveness of the local industry, the smaller must be the leverage of protectionist interest groups in order for results in case of mutual trade liberalization to be perceived as superior to other outcomes (that is $\partial\mu/\partial\lambda = -4\,(1-\lambda)^2 / \left(5 - 2\lambda - 3\lambda^2\right)^2 < 0$ for all values of $\lambda < 1$)

Figure 2 displays pivotal values in the stakes and the leverage of interest groups according to eqs.(5) and (6). The perception of protectionism to pay off politically that implies a lower bound on the leverage μ, eq.(5), corresponds to the upward sloping solid curve. For all combinations λ, μ below this curve, trade liberalization is perceived better while for all values above, protectionist regimes are considered to outperform trade liberalization.

The upper bound on the leverage μ, that is the pivotal values of the parameters to yield a higher pay off for a regime of mutually open markets when considered from a political stance, eq.(6), corresponds to the downward sloping (dotted) line. Cooperation in trade liberalization is considered better for all values of λ, μ that are below the dotted line. Otherwise, that is, above the dotted line, a protectionist strategy is considered to yield better results (notably, in purely political reasoning).

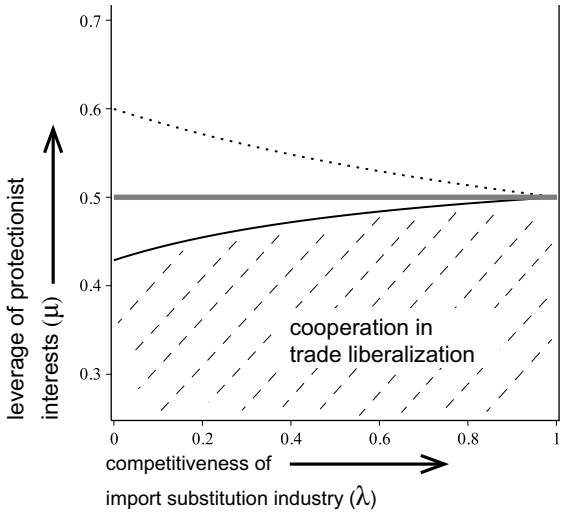

Figure 2. Strategy space with leverage factor μ

The hatched area in Fig. (2) thus indicates the parameter combinations for which cooperation in trade liberalization obtains when both of these bounds apply. Notably, for a number of parameter constellations, trade liberalization obtains despite of the presence of groups sharing an interest in holding onto a protectionist policy. Naturally, as λ approaches unity, the set of parameters μ for which the "pure" prisoner's dilemma ranking holds is smallest.

4. Evolutionary Stable Strategies in Reciprocating Trade Policies: What are the Chances for the Emergence of Cooperation in Trade Liberalization?

However, when adopting an evolutionary perspective, outcomes also depend on the expected pay off from a continuing trade relationship. This raises the bars for protectionism to pay off because in case of TFT this trade relationship is at risk whenever the protectionist calculus is imminent. The risk of protectionist trade policy facing retaliation is to be included as a cost in any comparison of strategies. In line with repeated interaction models let parameter q thus denote the expected frequency of trade in the future.

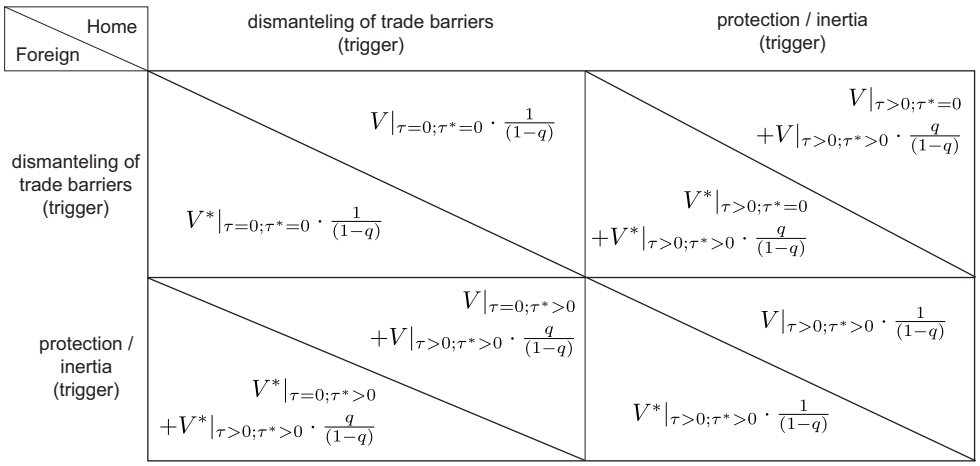

Figure 3. Pay Offs: "Trigger Strategies in Trade Policies"

The parameter may include a discount rate or not. Adding another, explicit, time-specific element, however, does not change the calculus in any substantial way, so we will leave open what kind of information or characteristics of preferences enter q and instead interpret q as an amalgamation of (eventually) highly subjective considerations. Presumably, initial behavior triggers either cooperation in trade liberalization or retaliation of protectionist strategies along TFT lines. Figure 3 has the expected pay offs in repeated interaction, with $V|_{\tau=0;\tau^*=0}$, $V|_{\tau>0;\tau^*=0}$, $V|_{\tau=0;\tau^*>0}$, $V|_{\tau>0;\tau^*>0}$, as previously noted (see also the Appendix for details).

Considering those trigger strategies then implies a lower bound on the (subjective) frequency parameter q for reciprocating trade liberalization to obtain. According to Maynard Smith (1976:42) and Axelrod and Hamilton (1981:1393), reciprocating trade liberalization must out-

perform two alternative trigger strategies, namely

- a strategy of defection (protection) despite cooperation of the opposite party which eventually triggers protection and
- a strategy of alternating between defection (in this case: protection) and cooperation (liberalization).

In an Axelrod-Rapoport nexus of social cooperation the two resulting inequalities have been shown to exhaust the strategy space. As such, they carry over to trade policy issues as outlined here, however, here, in modified form so as to reflect international transmission channels, that is

$$\begin{aligned} & V|_{\tau=0;\tau^*=0}/(1-q) > V|_{\tau>0;\tau^*=0} + (V|_{\tau>0;\tau^*>0})\, q/(1-q) \\ \wedge \quad & V|_{\tau=0;\tau^*=0}/(1-q) > (V|_{\tau>0;\tau^*=0})/\left(1-q^2\right) + (V|_{\tau=0;\tau^*>0})\, q/\left(1-q^2\right) \end{aligned}$$

Solving for q yields for our trade policy case:

$$\left.\begin{array}{ll} & q \geqslant \dfrac{V|_{\tau>0;\tau^*=0} - V|_{\tau=0;\tau^*=0}}{V|_{\tau>0;\tau^*=0} - V|_{\tau>0;\tau^*>0}} \\ \wedge & q \geqslant \dfrac{V|_{\tau>0;\tau^*=0} - V|_{\tau=0;\tau^*=0}}{V|_{\tau=0;\tau^*=0} - V|_{\tau=0;\tau^*>0}} \end{array}\right\} = \frac{\left(5\lambda^2 - 2\lambda - 3\right) + \mu\left(7 + 2\lambda - 9\lambda^2\right)}{(1-\mu)\,3\,(1-\lambda)^2} \tag{7}$$

Inequalities have to be satisfied in order for trade liberalization to emerge as an evolutionary stable strategy, that is a strategy, which is immune to more protecionist alternatives. For all values of q below protectionism prevails. Note that, for all $q > 0$, eq.(7) is less restrictive than eq.(5), irrespective of interest group parameters μ, λ. Hence, under TFT, the set of parameters sustaining a regime of open markets widens. There is thus more to TFT than just a fest for vested interests.

Figure 4 displays resulting pivotal values for q. The LHS panel of Fig. 4 shows how the competitiveness parameter of the import competing industry affects the threshold level of q that must at least be attained for mutual trade liberalization be considered politically superior to protection of the import substitution industry. Parameter combinations above a particular curve (that is, curves referring to a particular leverage μ of protectionist interests) sustain cooperation in trade liberalization with the trade regime evolutionary stable while those below do not. Each

curve thus displays the nexus for a given value of the political leverage parameter of protectionist interests μ, with μ increasing from the bottommost to the topmost curve. The horizontal line indicates that, for $\mu = 0.5$, q is independent of the interest groups' stake as measured by λ, with protectionism prevailing for all q below one third and trade liberalization for all q above one third. Note though that for all parameter values $\mu \neq 0.5$, the interest group issue is an important matter indeed either by softening or strengthening protectionist tendencies, probably augmented by the stakes those groups have in a protectionist regime.

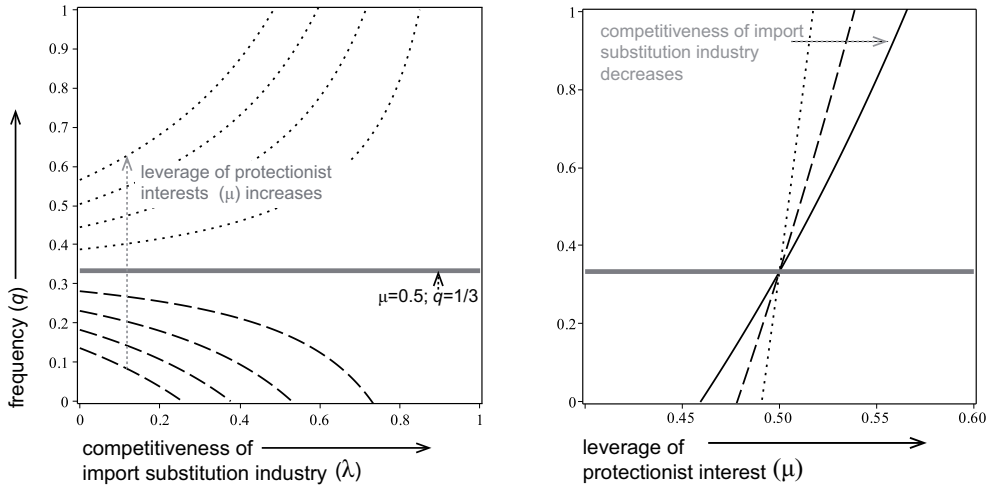

Figure 4. Evolutionary stable strategies with leverage factor μ

For values of μ below 0.5 (that is the dashed lines), the lower bound on q for trade liberalization being evolutionary stable decreases in λ for any given leverage μ (that is moving along a particular dashed line); for all values of μ above 0.5 (that is the dotted lines), it increases in λ. The former result obtains because of death weight losses weighing more heavily in case of $\mu < 0.5$ while increasing in λ whereas in case of the latter the opposite holds. In any case, the lower bound on q increases in μ for any given λ. However, very much in line with the Axelrod-literature on cooperation, the shadow of the future as represented by the frequency parameter q continues to play an important role, even with the political weight of special interests μ and the stake parameter λ as intervening parameters.

The RHS panel of Fig. 4 switches perspective by displaying the nexus in μ-q-space with various values for λ. As competitiveness decreases (or, equivalently, the stake in a protectionist regime

increases), the curve rotates clockwise around the point ($q = 1/3; \mu = 0.5$), with $\lambda = 0.75$ (dotted line), $\lambda = 0.5$ (dashed line), $\lambda = 0.25$ (solid line). Hence, for any given subjective preference in the form of frequency parameter q, the range of supported combinations, (μ, q), which are evolutionary stable, is larger the lower λ, provided q is larger than one third; with q smaller the reverse applies.

However, TFT may face a more hostile environment hosting outright protectionist countries. How, then, does the presence of interest groups influence TFT? On a more general account that includes *i*) the n-country case and *ii*) the chance of effective multilateralization of trade liberalization, TFT must also outperform more protectionist strategies. We hence must embed trade policy and international trade flows into the "fitness of groups" as outlined by Maynard Smith (1976:42). Suppose, therefore, that, at most, a fraction Q follows TFT whereas the complementary set, $(1 - Q)$, does not.

In this world it must be that TFT fares better in the eyes of the policy maker whomever he faces. With TFT nevertheless to prove an attractive strategy that ultimately feeds into a more liberal trade policy regime it must thus be the case that

$$Q\frac{V|_{\tau=0;\tau^*=0}}{(1-q)} + (1-Q)\left(V|_{\tau=0;\tau^*>0} + \frac{q}{(1-q)}V|_{\tau>0;\tau^*>0}\right) > Q\left(V|_{\tau>0;\tau^*=0} + \frac{q}{(1-q)}V|_{\tau>0;\tau^*>0}\right) + (1-Q)\frac{V|_{\tau>0;\tau^*>0}}{(1-q)}$$

Inserting $V|_{\tau=0;\tau^*} = 0, V|_{\tau>0;\tau^*} = 0, V|_{\tau=0;\tau^*} > 0, V|_{\tau>0;\tau^*} > 0$ as previously and solving for Q yields

$$Q > \frac{1}{2}\frac{\left[5\lambda^2 - 2\lambda - 3 + \mu\left(7 + 2\lambda - 9\lambda^2\right)\right]}{\left[3 - 2\lambda - \lambda^2 + \mu\left(3\lambda^2 + 2\lambda - 5\right)\right]}\frac{(1-q)}{q}$$

Figure 5 displays results. In order to display results in two dimensions, we assume in both of the panels that $\lambda = 0.5$. However, basically the same trade off between q and Q obtains for other values of λ. In both panels, the gray vertical line shows results for $Q = 1, \mu = 0.5$ with $q > 1/3$ as a pivotal value for trade liberalization to be evolutionary stable. This corresponds with situations as previously outlined when the world consists of TFT-players only. The solid black line in the RHS panel of Fig. 5 displays the lower bound on q for values of Q smaller

than unity, that is, in a more hostile world, with the lower bound on q higher the smaller the probability Q, provided $\mu = 0.5$ (that is the reference scenario of special interests simply being added up). This reflects a trade of between the mass of countries with TFT in policies and subjective frequency parameters q of policy makers for a continuing relationship. In principle, both of them are catering to more open markets. For values of $\mu > 0.5$ and increasing the lower bound rotates clockwise around the point $(Q = 0; q = 1)$ as shown by the dotted lines; for values of $\mu < 0.5$ and decreasing the lower bound rotates counterclockwise around the point $(Q = 0; q = 1)$ as shown by the dashed lines (when compared to the situation in which $\mu = 0.5$).

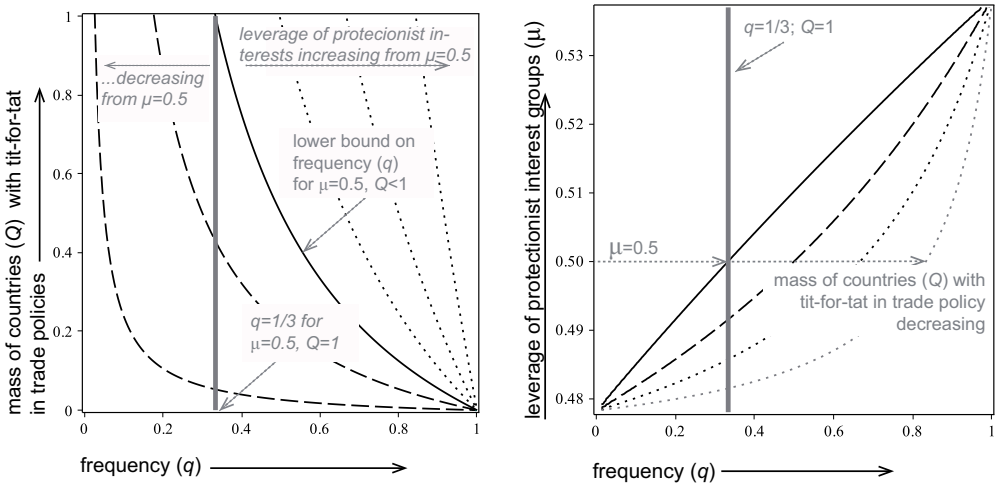

Figure 5. Lower bounds on q, Q with leverage factor μ parameterized

The RHS panel of Figure 5 shows the nexus between the leverage of domestic groups having an interest in the protection of local markets μ and the frequency parameter q. While for $Q = 1$ the solid line applies for cutting the policy-space into two parts, a lower fraction Q turns out to be more demanding for any given political leverage of interest groups μ so that the pivotal value for q in supporting and eventually sustaining a free trade regime increases. Hence, despite the presence of interest groups, their stake and their leverage, TFT tends to unfold a disciplining force that strengthens cooperation in trade liberalization and thus establishes a trajectory towards effective multilateralization of trade policies. This applies even in a world that is populated by a number of countries that generally aim at protecting their markets.

Naturally, a free trade regime does not emerge under each and every constellation of domestic interest groups. As such, TFT is no panacea. Nor do the results imply that TFT is in any case considered a superior strategy over any other strategy that might be available, including possibly the linking of trade issues with other policies or other forms of implicit compensation that effectively "bribe" protectionist interest groups or else tame their appetite and their vigorous effect. Note also that, here, we adopt a positive rather than a normative perspective on TFT in the narrow sense of the term. However, if applied, TFT tends to widen the set of constellations weaning domestic interest groups off protection rather than nourishing them therewith.

5. Conclusions and Outlook

Although criticized on a number of accounts, TFT is a well known strategy in supporting social cooperation. However, its applications extend well beyond the (small)-group level of individuals into the field of international politics and international political economy in particular. For instance, in trade policy, TFT is considered an appropriate strategy thus implicitly enforcing more open trade regimes. As such, TFT is even formally institutionalized within the dispute settlement understanding referring to trade conflicts that possibly arise under the roof of the WTO. However, there, as elsewhere, TFT is not embraced without qualification. Reservations are brought forward irrespective of whether it is employed as an informal institution or a formal institution in trade policy.

In particular, domestic interest groups are considered as possibly detrimental to trade regimes because TFT holds out the prospect of protection or at least seems to provide a legitimization for protectionist measures. If so, TFT would provide a fest for vested interests thus undermining rather than strengthening cooperation in trade liberalization. By embedding domestic interest groups in a trade policy cum TFT framework along Axelrod-Rapoport lines we show that TFT actually tends to widen the constellations that support a more open trade regime. The paper provides a novel approach in that it covers a wide range of possible constellations by parameterizing the political leverage interest groups might have in addition to their stake in a protecionist trade regime. It explores the circumstances under which TFT in trade policies proves evolution-

ary stable even in a world, in which a number of countries are outright protectionist. Notably, what matters for a more open trade regime to emerge and to prove sustainable is the capacity to retaliate, no matter whether formally institutionalized or not. The threat (rather than the actual punishment) might well be sufficient for TFT to effectively tame domestic interest groups. Henceforth, the concern that domestic interest groups might interfere with TFT as an informal or formal institution for cooperation in trade liberalization is less severe than it might seem at first glance.

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Appendix

This Appendix contains the intermediate steps in deriving strategies and perceived outcomes. Market clearing according to eq.(4) yields prices as depending on competitiveness λ and tariff distortion τ, τ^* in Home's respectively Foreign's import-substitution and export industries

$$\begin{aligned} p_1 &= \frac{(1-\lambda)+\tau}{2}; \qquad p_1^* = \frac{(1-\lambda)-\tau}{2} \\ p_2 &= \frac{(1-\lambda)-\tau^*}{2}; \qquad p_1^* = \frac{(1-\lambda)+\tau^*}{2}. \end{aligned}$$

Inserting prices in the demand function, we obtain for aggregate demand in Home and Foreign

$$\begin{aligned} D_1(p_1) &= \frac{(1+\lambda)-\tau}{2}; \quad D_1^*(p_1^*) = \frac{(1+\lambda)+\tau}{2} \\ D_2(p_2) &= \frac{(1+\lambda)+\tau^*}{2}; \quad D_2^*(p_2^*) = \frac{(1+\lambda)-\tau}{2}. \end{aligned}$$

Consumer surplus in Home is $CS_i = D_i\left(p_{max} - p_i\right)$ with $p_{max} = 1$ according to eq.(2) and $i = 1, 2$. Correspondingly in Foreign. Inserting demand and prices thus yields

$$\begin{aligned} CS_1 &= \frac{(1-p_1)^2}{2} = \frac{[(1+\lambda)-\tau]^2}{8}; \qquad CS_2 = \frac{(1-p_2)^2}{2} = \frac{[(1+\lambda)+\tau^*]^2}{8} \\ CS_1^* &= \frac{(1-p_1^*)^2}{2} = \frac{[(1+\lambda)+\tau]^2}{8}; \qquad CS_2^* = \frac{(1-p_2^*)^2}{2} = \frac{[(1+\lambda)-\tau^*]^2}{8}. \end{aligned}$$

Neglecting costs in order to facilitate the analysis, producer surplus PS is equal to sales revenue

$$\begin{aligned} PS_1 &= X_1 p_1 = \lambda p_1 = \lambda \frac{(1-\lambda)+\tau}{2}; & PS_2 &= X_2 p_2 = p_2 = \frac{(1-\lambda)-\tau^*}{2} \\ PS_1^* &= X_1^* p_1^* = p_1^* = \frac{(1-\lambda)-\tau}{2}; & PS_2^* &= X_2^* p_2^* = \lambda p_2^* = \lambda \frac{(1-\lambda)+\tau^*}{2} \end{aligned}$$

and imports are the differences between local demand and supply

$$M_1 = D_1\left(p_1\right) - X_1 = \frac{(1-\lambda)-\tau}{2}; \quad M_2^* = D_2^*\left(p_2^*\right) - X_2^* = \frac{(1-\lambda)-\tau^*}{2}$$

Assuming a myopic government that squeezes out the max in tariff revenue respectively rents, i.e. $\partial\left(\tau M_1\right)/\partial\tau = 0$, tariffs are $\tau = (1-\lambda)/2$. By analogy, we obtain in case of Foreign

$\tau^* = (1-\lambda)/2$. Inserting this information on policy into all the relevant functions yields the following set of intermediate results with results conditional (as indicated by a vertical bar) on whether tariffs are imposed (that is $\tau > 0, \tau^* > 0$) or not ($\tau = 0, \tau^* = 0$).

$$p_1|_{\tau=0} = \frac{1}{2}(1-\lambda); \quad p_2|_{\tau^*=0} = \frac{1}{2}(1-\lambda); \quad p_1^*|_{\tau=0} = \frac{1}{2}(1-\lambda); \quad p_2^*|_{\tau^*=0} = \frac{1}{2}(1-\lambda)$$
$$p_1|_{\tau>0} = \frac{3}{4}(1-\lambda); \quad p_2|_{\tau^*>0} = \frac{1}{4}(1-\lambda); \quad p_1^*|_{\tau>0} = \frac{1}{4}(1-\lambda); \quad p_2^*|_{\tau^*>0} = \frac{3}{4}(1-\lambda)$$

$$D_1|_{\tau=0} = \frac{1}{2}(1+\lambda); \quad D_2|_{\tau^*=0} = \frac{1}{2}(1+\lambda); \quad D_1^*|_{\tau=0} = \frac{1}{2}(1+\lambda); \quad D_2^*|_{\tau^*=0} = \frac{1}{2}(1+\lambda)$$
$$D_1|_{\tau>0} = \frac{1}{4}(1+3\lambda); \quad D_2|_{\tau^*>0} = \frac{1}{4}(3+\lambda); \quad D_1^*|_{\tau>0} = \frac{1}{4}(3+\lambda); \quad D_2^*|_{\tau^*>0} = \frac{1}{4}(1+3\lambda)$$

$$CS_1|_{\tau=0} = \frac{(1+\lambda)^2}{8}; \quad CS_2|_{\tau^*=0} = \frac{(1+\lambda)^2}{8}; \quad CS_1^*|_{\tau=0} = \frac{(1+\lambda)^2}{8}; \quad CS_2^*|_{\tau^*=0} = \frac{(1+\lambda)^2}{8}$$
$$CS_1|_{\tau>0} = \frac{(1+3\lambda)^2}{32}; \quad CS_2|_{\tau^*>0} = \frac{(3+\lambda)^2}{32}; \quad CS_1^*|_{\tau>0} = \frac{(3+\lambda)^2}{32}; \quad CS_2^*|_{\tau^*>0} = \frac{(1+3\lambda)^2}{32}$$

$$PS_1|_{\tau=0} = \frac{\lambda(1-\lambda)}{2}; \quad PS_2|_{\tau^*=0} = \frac{(1-\lambda)}{2}; \quad PS_1^*|_{\tau=0} = \frac{(1-\lambda)}{2}; \quad PS_2^*|_{\tau^*=0} = \frac{\lambda(1-\lambda)}{2}$$
$$PS_1|_{\tau>0} = \frac{3\lambda(1-\lambda)}{4}; \quad PS_2|_{\tau^*>0} = \frac{(1-\lambda)}{4}; \quad PS_1^*|_{\tau>0} = \frac{(1-\lambda)}{4}; \quad PS_2^*|_{\tau^*>0} = \frac{3\lambda(1-\lambda)}{4}$$

$$\tau M_1 = \frac{(1-\lambda)^2}{8}; \quad \tau^* M_2^* = \frac{(1-\lambda)^2}{8}$$

Consequently, a "one-shot game" yields expected pay offs in strategies as follows

$$\begin{aligned}
V|_{\tau=0;\tau^*=0} &= (1-\mu)\left[\frac{(1+\lambda)^2}{8} + \frac{(1+\lambda)^2}{8} + \frac{(1-\lambda)}{2}\right] + \mu\frac{\lambda(1-\lambda)}{2} \\
V|_{\tau>0;\tau^*=0} &= (1-\mu)\left[\frac{(1+\lambda)^2}{8} + \frac{(1+3\lambda)^2}{32} + \frac{(1-\lambda)}{2}\right] + \mu\left[\frac{3\lambda(1-\lambda)}{4} + \frac{(1-\lambda)^2}{8}\right] \\
V|_{\tau=0;\tau^*>0} &= (1-\mu)\left[\frac{(1+\lambda)^2}{8} + \frac{(3+\lambda)^2}{32} + \frac{(1-\lambda)}{4}\right] + \mu\frac{\lambda(1-\lambda)}{2} \\
V|_{\tau>0;\tau^*>0} &= (1-\mu)\left[\frac{(1+3\lambda)^2}{32} + \frac{(3+\lambda)^2}{32} + \frac{(1-\lambda)}{4}\right] + \mu\left[\frac{3\lambda(1-\lambda)}{4} + \frac{(1-\lambda)^2}{8}\right] \qquad (8)
\end{aligned}$$

with $V|_{\tau=0;\tau^*=0}$, $V|_{\tau>0;\tau^*=0}$, $V|_{\tau=0;\tau^*>0}$, $V|_{\tau>0;\tau^*>0}$ corresponding to Fig. 1 and to trigger entries in Fig. 3.