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Tariff negotiations in Rubinstein bargaining model

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Abstract

This paper applies Rubinstein bargaining model to tariff negotiations in order to predict the outcome of the bargaining. Following Dixit (1987) and Mayer (1981), we are able to express tariff strategies in the form of reaction functions. This results in a strategy space much larger than that considered in the literature and also in a smooth welfare frontier. Having applied Rubinstein Bargaining model, we have characterized the outcome of the tariff negotiations and given an example, which indicates that the negotiations will lead to free trade when countries are symmetric.

1. Introduction

It is well known in economics that an economic agent with monopoly power can use this power to its advantage. In the context of international trade, by employing trade restrictions such as tariffs, the government of a country with monopoly power in the world trade can exploit this power. When two or more such governments behave this way, they initiate a trade war. In the case of tariffs, when countries start a tariff war in which each country charges the tariff rate that maximizes its welfare given the other country's tariff rate, the outcome of the resulting non-cooperative Nash equilibrium, which we call tariff-retaliation equilibrium, is Pareto inefficient. Thus, as a result of the tariff war, countries move from an efficient outcome (free trade) to an inefficient one (tariff-retaliation equilibrium)[1]. Given that the tariff-

[1] It is even possible that both countries are worse off at the end of the tariff war than at the free trade (prisoner’s dilemma case). Of course, if one of the countries is small in the sense that it can't influence the terms of trade, the optimal thing for this country to

retaliation equilibrium is inefficient, there must exist tariff combinations which will make both countries better off. This can be achieved only through coordination, though. One of the things they can do is to bargain over those welfare-improving tariff rates. This paper applies Rubinstein bargaining model to tariff negotiations in the two-country framework of Mayer's (1981) model in order to predict the outcome of negotiations.

Mayer (1981) develops a theoretical framework to characterize the possible outcomes of tariff negotiations and emphasizes the importance of country size, negotiation rules, and domestic interest groups in determining the general nature of possible tariff agreements. The first work that has applied a game-theoretic approach to tariff negotiations is by Riezman (1982). He uses the Nash cooperative solution to describe the outcome of negotiations and points out the conditions under which free trade will be reached as a result of negotiations. Using the Nash cooperative solution, Chan (1988) examines the impact on trade negotiation outcomes due to different feasible utility-payoff sets.

In our model, following Mayer (1981) and Dixit (1987), we are able to express the welfare levels as functions of tariff rates. Once this is done, we can explicitly derive reaction functions, which will allow us to specifically find the tariff rate optimal given the other country's tariff. This leads to a strategy space much larger than that considered in the literature.[2] Furthermore, as a result of having explicit reaction functions, when countries reach an agreement through negotiations, tariff rates corresponding to the agreement can be specifically derived.

When the negotiation set is constructed, countries are allowed to choose any pair of tariffs as long as no country can be made better off without making the other country worse off (Pareto efficiency) and that each country's payoff at the end of the agreement is at least as large as the one corresponding to the tariff-retaliation equilibrium[3]. To

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do is to set its tariff rate to zero no matter what the other country's tariff rate is. From the optimal tariff theorem, it follows that the other country in this case will be better off at the tariff-retaliation equilibrium than at the free trade.

[2] In the literature, each country has two strategies, namely no tariff and optimal tariff, tariff that is optimal given the other country's tariff. The latter corresponds to reaction function in our case.

[3] With the imposition of these two conditions, the negotiated tariff pair will not be on the reaction functions. As a result, if it was not assumed that the agreement is binding, each country would have an incentive to deviate. This problem could be solved in the absence of such an assumption by adding an implementation phase where trigger strategies can be used to sustain the agreed-upon tariff pair (see Furusawa (1999), Bac and Raff (1997), and Dixit(1987))

each point on the resulting frontier, a pure strategy combination will correspond in our model, unlike in the literature where one of the countries must use a randomized strategy (except at the point corresponding to free trade). Moreover, the resulting welfare frontier will be a smooth one.

Equipped with a much larger strategy space and a smooth welfare frontier, this paper adopts Rubinstein bargaining model in order to predict the outcome of tariff negotiations and shows that both countries can achieve a higher welfare as a result of bargaining.[4]

The paper is organized as follows. First, it is shown that tariff retaliation equilibrium is Pareto inefficient. Next, the Rubinstein bargaining model is employed for bargaining between two countries over tariff rates. Then a specific example is given, which is followed by the conclusion.

2. Tarif-retaliation equilibrium[5]

Imagine a two-good, two-country world where goods are X and Y, and countries are Home (H) and Foreign (F), with each country being large enough to affect the terms of trade. It is assumed that H (F) imports Y (X). Let t (t^*) and $(P_x,\ P_y)$ $((P_x^*,\ P_y^*))$ denote H's (F) ad valorem tariff rate on its imports of Y (X) and prices of goods at H (F), respectively. Because of tariff on imports, prices in the two countries are not the same. They are related as follows;

$$P_y = (1+t)P_y^* \quad \text{and} \quad P_x^* = (1+t^*)P_x$$

Let π denote H's terms of trade (number of units of export good (good X) per unit of import good (good Y)).

Then π is given by[6]

$$\pi = P_y^* / P_x$$

Of course, F's terms of trade is $1/\pi$

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4 Rubinstein bargaining model is employed in a different context and model by Horstmann et al. (2003). In a two-country, two-issue bargaining model they contrast outcomes when issues are negotiated separately and when they are linked and show that linking issues generates additional gains for both countries, except in the case that an issue, when viewed in isolation, yields the country an exceptionally large negative payoff.

5 This section closely follows Mayer (1981), and Dixit (1987)

6 Conventionally, the terms of trade ratio is defined the other way around but Mayer (1981) uses this definition so, to be consistent, the same definition is adopted in this paper.

Each country is represented by a single consumer with strictly quasi-concave utility function. Consumer can influence neither prices of goods nor tariff rate. Therefore, from consumer's optimization problem, H's welfare level, U( ), and import demand, M( ), will be functions of terms of trade and tariff rate.

More specifically,

$U(\pi, t)$ and $M(\pi, t)$

Similarly, for F we have

$U^*(\pi, t^*)$ and $M^*(\pi, t^*)$

Under the trade balance condition that the value of imports is equal to that of exports, and using the relation that H's exports are equal to F's imports, we have

$$\pi M(\pi, t) = M^*(\pi, t^*)$$

which gives the terms of trade as a function of tariffs; that is, $\pi = \pi(t, t^*)$.

Substitution of $\pi(t, t^*)$ into $U(\pi, t)$ and $U^*(\pi, t^*)$ yields

$$W(t, t^*) \equiv U(\pi(t, t^*), t)$$

$$W^*(t, t^*) \equiv U^*(\pi(t, t^*), t^*)$$

As we see, the channel for strategic interaction are the terms of trade; that is, tariffs levied by one country influences the welfare of the other country through the terms of trade.

Under the Marshall-Lerner stability condition that the sum of import demand elasticities is greater than 1, each country's tariff improves its terms of trade implying that it worsens the other country's terms of trade[7]. More specifically, we have

$$\frac{\partial \pi}{\partial t} < 0 \quad \text{and} \quad \frac{\partial \pi}{\partial t^*} > 0$$

Then,

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[7] Using the trade balance condition and the relationship between world prices and domestic prices established through the tariff, an expression for the effect on the terms of trade of tariff can be derived where it is found that Marshall-Lerner condition is sufficient for the tariff to improve the importing nation's terms of trade (see, for example, Appendix I in Ethier (1988)). Intuitively, this condition says that offer curves of two countries together must be elastic for the tariff to improve the terms of trade. It is theoretically even possible that terms of trade of tariff-levying nation improves so much that the resulting domestic price level is lower than the level that has prevailed in the absence of the tariff (Meltzer paradox).

$$\frac{\partial W}{\partial t^*} = \frac{\partial U}{\partial \pi}\frac{\partial \pi}{\partial t^*} < 0 \qquad \text{=> F's tariff harms H}$$

$$\frac{\partial W^*}{\partial t} = \frac{\partial U^*}{\partial \pi}\frac{\partial \pi}{\partial t} < 0 \qquad \text{=> H's tariff harms F}$$

We also have

$$\frac{\partial W}{\partial t} > 0 \text{ when } t = 0 \quad \text{for any } t^*$$

$$\frac{\partial W^*}{\partial t^*} > 0 \text{ when } t^* = 0 \text{ for any t}$$

which says that a country can increase its welfare by levying a tariff when initially not doing so, no matter what the other country's tariff rate is.

In particular,

$$\frac{\partial W}{\partial t} > 0 \text{ when } t = 0 \quad \text{for } t^* = 0$$

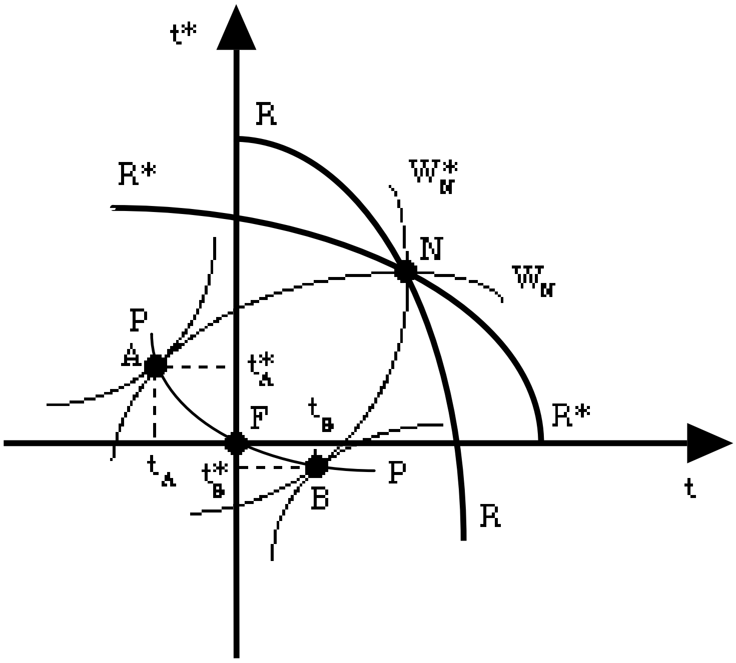
$$\frac{\partial W^*}{\partial t^*} > 0 \text{ when } t^* = 0 \text{ for } \; t = 0$$

This means that there exists an incentive for each country to deviate from free trade, where $t = t^* = 0$. We can also see this from optimal tariff theorem.

Given that trading equilibria are unique, which is assumed here, each country's indifference map can be represented in (t, t*) plane. Tariff combinations on an indifference curve[8] in (t, t^*) plane are those ones that make both countries' offer curves intersect along the same trade indifference curve. Given the indifference map in (t, t*), the reaction function, which gives the tariff rate maximizing that country's welfare for a given tariff rate of the other country, can be derived. The intersection of these reaction functions (RR, R*R*) will yield the tariff-retaliation equilibrium, N. This is shown in Figure 1.

8 Mayer (1981) derives an expression for the slope of the indifference curve (page 151, Appendix I)

Figure 1



As seen in Figure 1, there are many tariff combinations including $(t = t^* = 0)$ in this case which will make both countries better off than at N, the tariff-retaliation equilibrium. Note that at all of these combinations, tariff rates are lower in both countries than those at N, (t_N, t_N^*) [9]. By coordinating their behavior, countries can obtain higher utility. One thing that they can do is to bargain over those tariff combinations that are Pareto superior to (t_N, t_N^*).

We will require that bargaining outcome be Pareto efficient. Along PP curve, consumers in both countries face the same relative prices.

$$P_x / P_y = P_x^* / P_y^* \qquad (1)$$

Since $P_x^* = (1 + t^*)P_x$ and $P_y = (1 + t)P_y^*$, the above relation implies that Pareto efficiency is represented, in addition to (1), by

$$tt^* + t + t^* = 0 \qquad (2)$$

9 These tariff rates are not shown in Figure 1 not to cluster it.

The equation (2) indicates that if one country is taxing its imports, then, to obtain Pareto efficiency, the other country must subsidize its imports.

It is also required that tariff rates that they agree upon at the end of the bargaining also satisfy the following relations

$$t \in [t_A, t_B] \quad \text{and} \quad t^* \in [t^*_B, t^*_A] \qquad (3)$$

Otherwise, someone will be worse off than at N.

Then, (2) and (3) imply that the outcome of the bargaining will be at some point on PP curve between A and B. H will want to move as close to B as possible whereas F will want to be as close to A as possible.

3. Tarif negotiations in Rubinstein bargaining model

In this section we assume that countries can get together and make binding agreements. We will investigate which tariff combination will be selected when countries negotiate according to the Rubinstein bargaining model.

Two countries set out to divide a surplus between them. If they agree, each receives its agreed share. Otherwise, each receives payoff at N, (W_N, W^*_N). So (W_N, W^*_N) is the disagreement point.

Each proposal contains a pair of tariff rates, (t, t^*). Proposing country's tariff rate is determined by that country and the other country's tariff rate is found using (2), given the proposing country's tariff rate. For example, if H proposes to impose $t^{'}$, then tariff rate H offers F to charge is $t^{*'} = -t^{'}/(1+t^{'})$. Similarly, the tariff rate for H when F makes the offer is given by $t = -t^{*}/(1+t^{*})$. This is needed for the bargaining outcome to be Pareto efficient, which is required here. Thus, each proposal is corresponding to a point on PP curve between A and B (the negotiation set), which gives certain payoffs $W(t, t^*)$, $W^*(t, t^*)$ to both countries; i.e. divides the surplus in a certain way between two countries.

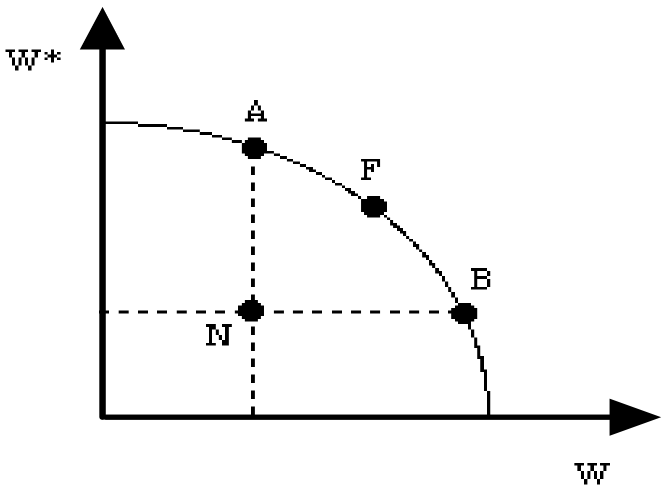
The bargaining process involves the countries taking turns at making proposals. At T=0, H makes a proposal which represents a certain division of the surplus between the two countries. F immediately replies Yes or No. If it says Yes, the game ends, everybody charges the proposed tariff rate and receives part of the surplus given by the proposal. If F says No, then at T=1 it makes a proposal to which H immediately replies and so on. The payoff to H as agreed at time T equals $\delta^T W(t, t^*)$, where δ is the discount factor for both countries and (t, t^*) is the agreed proposal. A strategy for a country specifies its proposal/reply at each point as a function of the history of the game up to that point.

The notion of the equilibrium used here is that of Subgame Perfect Equilibrium (SPE). In this game there is a unique partition of the surplus, which can be supported as a SPE. In this equilibrium agreement is immediate.

Figure 2 translates Figure 1 to welfare space. Notation is preserved. The Utility Possibility Frontier (UPF) can be expressed as $W = f(W^*)$. Given that relation is one-to-one, we can write $W^* = f^{-1}(W)$. Since the disagreement point is N, the UPF with the origin N is given by

$$W = f(W^* + W_N^*) - W_N \quad \text{or} \quad W^* = f^{-1}(W + W_N) - W_N^* \quad (4)$$

Figure 2



To show the uniqueness it suffices to show that the maximum payoff H can obtain in any SPE is equal to the minimum payoff it can receive in any SPE of this game.

Let W_h represent the maximum payoff H can obtain in any SPE of this game. Consider the subgame beginning with an offer made by H at T=2. Notice that this subgame has the same structure as the original game. Therefore, the maximum payoff H can obtain in any SPE of this subgame is again W_h.

Now consider the proposal made by F at T=1. Any offer which gives H a payoff more than δW_h will certainly be accepted. Therefore, F will offer to give δW_h. This implies that the payoff F obtains in any SPE can't be less than $f^{-1}(\delta W_h + W_N) - W_N^*$.

Now consider H's offer at T=0. Any offer by H, which gives F a payoff less than $\delta[f^{-1}(\delta W_h + W_N) - W_N^*]$ will be rejected. Hence H will obtain at most a payoff equal to $f(\delta f^{-1}(\delta W_h + W_N) + (1-\delta)W_N^*) - W_N$. In fact, this represents the maximum of what H will obtain in any SPE. I.e. it equals W_h <==>

$$W_h = f(\delta f^{-1}(\delta W_h + W_N) + (1-\delta)W_N^*) - W_N \tag{5a}$$

Let W_l represent the minimum payoff that H can receive in any SPE of this game.

Consider the subgame beginning with a proposal made by H at T=2. This subgame has the same structure as the original game. As a result, the minimum payoff H can obtain in any SPE of this game is W_l.

Now consider the offer made by F at T=1. Any offer which gives H at least δW_l will certainly be accepted. Hence F will offer to give δW_l. Then the payoff F receives in any SPE can't be greater than $f^{-1}(\delta W_l + W_N) - W_N^*$.

Now consider the offer H makes at T=0. Any offer by H which gives F less than $\delta[f^{-1}(\delta W_l + W_N) - W_N^*]$ will not be accepted. Hence H will obtain at least a payoff equal to $f(\delta f^{-1}(\delta W_l + W_N) + (1-\delta)W_N^*) - W_N$. This represents the minimum of what H will obtain in any SPE. Therefore,

$$W_l = f(\delta f^{-1}(\delta W_l + W_N) + (1-\delta)W_N^*) - W_N \tag{5b}$$

(5a) and (5b) =>

$$W_h = W_l \equiv W_e \tag{6}$$

Hence SPE is unique and W_e represents the payoff for H in this unique SPE of the game with the origin of the UPF at (W_N, W_N^*). The payoff for F at the SPE is

$$W_e^* = f^{-1}(W_e + W_N) - W_N^* \tag{7}$$

Once W_e and W_e^* are determined, tariff rates supporting the unique SPE can be found from

$$W_e + W_N = W(t, t^*) \quad \text{and} \quad W_e^* + W_N^* = W^*(t, t^*) \tag{8}$$

As pointed out earlier, the negotiated tariff pair will not be on the reaction functions, due to conditions (given in (2) and (3)) imposed in constructing the negotiation set. Therefore, there exist incentives to deviate from the bargaining outcome. We, however, have assumed that the agreement is binding so countries can not charge tariff rates different from those agreed upon. If we did not assume that the agreement is binding, an infinitely repeated version of the model could be considered in order for the deviation incentives to cease to exist.[10]

4. An example

Utility functions for H and F are given by (9a) and (9b), respectively.

$$U(X_h, Y_h) = X_h^{.5} Y_h^{.5} \tag{9a}$$

$$U^*(X_f, Y_f) = X_f^{.5} Y_f^{.5} \tag{9b}$$

where X_i and Y_i are consumption of good X and consumption of good Y by country i with i = h, f.

(10a) and (10b) represent endowment vectors for H and F, respectively.

$$E = (E_x, E_y) = (3/4, 1/4) \tag{10a}$$

$$E^* = (E_x, E_y) = (1/4, 3/4) \tag{10b}$$

where E_j represents endowment level of good j with j = x, y.

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[10] Young-Han (2004), for example, considers the infinitely repeated tariff bargaining in which he examines the optimal trade negotiation regimes in the tariff negotiation involving asymmetric multiple negotiators and shows that the sequential bilateral negotiation is preferred by large economies while the multiple negotiation regime is welfare dominant for small economies.

It is assumed that in equilibrium H exports good X and F exports good Y. X and Y also represent volume of trade in equilibrium.

Consumer at H solves the following optimization problem

$$\max \quad U(X_h, Y_h) = X_h^{.5} Y_h^{.5}$$

$$\text{s.t:} \quad pX_h + (1+t)qY_h = p(3/4) + (1+t)q(1/4) + tqY \qquad (11)$$

where p, q and t are world price of X, world price of Y and tariff rate H charges on imports of Y, respectively.

Solution to (11) yields demand functions for good X and good Y as

$$X_h = [p(3/4) + (1+t)q(1/4) + tqY]/2p \qquad (12a)$$

$$Y_h = [p(3/4) + (1+t)q(1/4) + tqY]/2(1+t)q \qquad (12b)$$

Since numerators in (12a) and (12b) are identical,

$$X_h 2p = Y_h 2(1+t)q \qquad (13)$$

Using $X_h = E_x - X = (3/4) - X$ and $Y_h = E_y + Y = (1/4) + Y$, and defining the terms of trade ratio as $\pi = q/p$, (13) can be rewritten as

$$((3/4) - X) = (1+t)((1/4) + Y)\pi \qquad (14)$$

From the budget constraint, we can express π as a function of t, X and Y, and substitute the resulting expression for π into (14). Then we obtain for H

$$(3/4)/X = ((1+t)/(4Y) + t + 2) \qquad (15a)$$

(15a) implicitly defines H's offer curve.

Given the symmetry, (15b) implicitly defines F's offer curve.

$$(3/4)/Y = ((1+t^*)/(4X) + t^* + 2) \qquad (15b)$$

where t^* is tariff rate F charges on its imports of good X.

Solving equations (15a) and (15b) for X and Y, we find market clearing consumption levels as functions of t and t^*.

$$X_h = [(3/4) + (1+t^*)/4]/[1 + (1+t^*)/4 + (3/(4(1+t)))] \qquad (16a)$$

$$X_f = 1 - X_h = [(3/4) + (1+t^*)/4]/[1 + (1+t^*)/4 + (3/(4(1+t)))] \qquad (16b)$$

$$Y_h = [(3/4) + (1+t^*)/4]/[(1+t^*) + (1/4)(1+t)(1+t^*) + (3/4)] \qquad (16c)$$

$$Y_f = 1 - Y_h = [(3/4) + (1+t^*)/4]/[(1+t^*) + (1/4)(1+t)(1+t^*) + (3/4)] \qquad (16d)$$

Plugging these consumption levels into utility functions, we express the utility functions as a function of t and t^*. Let

$$W(t,t^*) \equiv U(X_h(t,t^*), Y_h(t,t^*)),$$

and

$$W^*(t,t^*) \equiv U^*(X_f(t,t^*), Y_f(t,t^*))$$

$$W(t,t^*) = [(4+t^*)(1+t)^{1/2}]/[(4(1+t)+(1+t)(1+t^*)+3)^{1/2}(4(1+t^*)+(1+t)(1+t^*)+3)^{1/2}] \quad (17a)$$

$$W^*(t,t^*) = [(4+t)(1+t^*)^{1/2}]/[(4(1+t)+(1+t)(1+t^*)+3)^{1/2}(4(1+t^*)+(1+t)(1+t^*)+3)^{1/2}] \quad (17b)$$

Having expressed utility functions in terms of t and t^*, we can now find the tariff retaliation equilibrium in (t, t^*).

$$\frac{\partial W}{\partial t} = 0 \Rightarrow$$

$$1/(1+t) = (5+t^*)(4(1+t)+(1+t)(1+t^*)+3)^{-1} + (1+t^*)(4(1+t^*)+(1+t)(1+t^*)+3)^{-1} \quad (18a)$$

(18a) implicitly defines H's reaction function.

And $\frac{\partial W^*}{\partial t^*} = 0 \Rightarrow$

$$1/(1+t^*) = (5+t)(4(1+t^*)+(1+t)(1+t^*)+3)^{-1} + (1+t)(4(1+t)+(1+t)(1+t^*)+3)^{-1} \quad (18b)$$

(18b) implicitly defines F's reaction function.

From (18a) and (18b), we find the tariff-retaliation equilibrium levels of tariff rates as

$$t_N = t_N^* = 3^{1/2} - 1 \quad (19)$$

Welfare levels corresponding to the tariff-retaliation equilibrium are given by (20).

$$W(t_N, t_N^*)(\equiv W_N) = W^*(t_N, t_N^*)(\equiv W_N^*) = .48 \quad (20)$$

Welfare levels corresponding to free trade are obtained by setting $t = t^* = 0$, and they are given by (21).

$$W(t = 0, t^* = 0) = W^*(t = t^* = 0) = .5 \quad (21)$$

As we see, at the tariff-retaliation equilibrium both countries are worse off than at the free trade. This is an instance of the Prisoners' dilemma.

In order to find the unique SPE, we need to determine the utility possibility frontier (UPF). It is found by solving the following optimization problem.

$$\max \quad U(X_h, Y_h) = X_h^{.5} Y_h^{.5}$$

$$\text{s.t.: } U^* = (1 - X_h)^{.5}(1 - Y_h)^{.5} \quad (22)$$

Solution to this optimization problem yields

$$X_h = Y_h = 1 - U^* \tag{23}$$

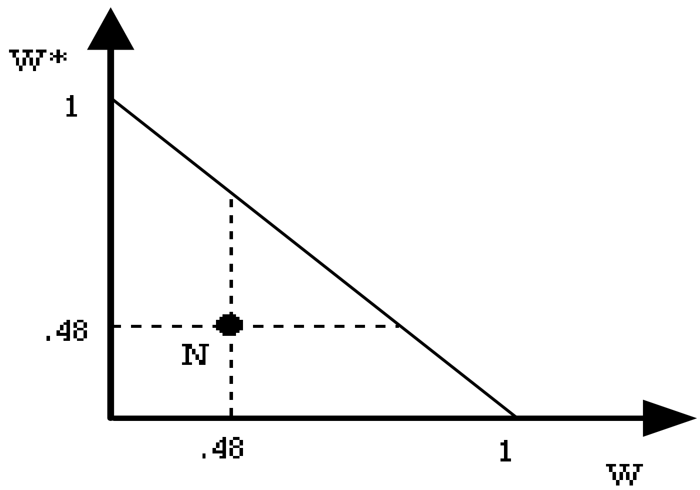
Using (23), we obtain the function that defines UPF as

$$W(W^*) = U(X_h = 1 - U^*, Y_h = 1 - U^*) = 1 - U^* = 1 - W^* \tag{24}$$

From $W + .48 = 1 - (W^* + .48)$, we find the function that gives UPF with the origin at $(W = .48, W^* = .48)$ as

$$W = .04 - W^* \tag{25}$$

Figure 3



Division of surplus corresponding to the unique SPE is found from (5a) and (5b), and they are given by (26a) and (26b).

$$W_e = .04(1 - \delta)/(1 - \delta^2) \tag{26a}$$

$$W_e^* = \delta.04(1 - \delta)/(1 - \delta^2) \tag{26b}$$

The only asymmetry in this game is that there is an advantage to the first mover. In our case H has an advantage, which is reflected by $W_e > W_e^*$. This unattractive feature of the model can be removed either by determining the identity of the proposer in each period by tossing a coin or by letting the time delay between successive periods go from 1 to 0. Then the equilibrium shares become

$$W_e = W_e^* = .02 \tag{27}$$

The equal division of the surplus is what one would expect in a bargaining, given the symmetry indicating that countries have the same bargaining power.

The total payoff to each country at the unique SPE is

$$W = W_e + W_N = .02 + .48 = .5 \tag{28a}$$

$$W^* = W_e^* + W_N^* = .02 + .48 = .5 \tag{28b}$$

Since these are the payoff levels corresponding to the free trade, the tariff rates supporting the SPE are $t = t^* = 0$. So in this example when the Rubinstein model is used as the bargaining model describing the bargaining between two countries over the tariff rates, this model predicts that countries will agree to the free trade.[11] It is not surprising in this example that free trade emerges as the outcome of the bargaining, given the fact that countries are symmetric and that gains from reaching free trade are evenly distributed. It can’t be generalized, however. In case, for example, one country is large and the other country is small, since large country will be better off at the tariff-retaliation equilibrium than at free trade, free trade outcome will not be achieved as a result of tariff negotiations.

5. Conclusion

This paper adopts the Rubinstein bargaining model in order to predict the outcome of tariff negotiations. The outcome of the bargaining is characterized at which both countries are able to reach to a higher welfare than if no bargaining has taken place (non-cooperative tariff retaliation outcome), and an example is given, which indicates that the negotiations will result in free trade when countries are symmetric.

Reaching an agreement over tariffs does not take away from the countries the monopoly power they have in the world trade. Given this fact and the fact that there exist other policies that can reproduce the effects of tariffs, after the agreement reached at the end of negotiations, countries will seek and invent other forms of protection to replicate the effects of the tariff. Therefore, an interesting direction for future research is to introduce other forms of protection into the model and consider designing the agreement in such a way that both gains from tariff reduction are realized and countries are given no incentive to replace reduction in tariffs with other forms of protection.

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[11] Riezman (1982) reaches the same result using the Nash cooperative solution.

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Özet

Rubinstein pazarlık modeline göre gümrük vergisi müzakereleri

Bu makalede Rubinstein pazarlık modeli gümrük vergisi müzakerelerine uygulanmakta ve bu modele göre müzakere sonucunun ne olacağı öngörülmektedir. Dixit (1987) ve Mayer (1981)'in çalışmalarından faydalanılarak, gümrük vergisi stratejileri tepki fonksiyonları olarak ifade edilmiştir. Bu ise literatürde yer alandan daha büyük bir strateji alanı ve ayrıca akışkan bir azami refah eğrisi elde etmemizi sağlamıştır. Rubinstein pazarlık modeli uygulandıktan sonra bu modelce öngörülen müzakere sonucu karekterize edilmiş, sonra bir örnek verilmiş ve bu örnekte ülkeler simetrik olduğunda müzakere sonucunun sebrest ticaret olacağı görülmüştür.