FREE TRADE AGREEMENTS ARE RARELY POLITICALLY VIABLE IN THE LONG-RUN

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ABSTRACT

Equilibrium tariff policies are determined within a Heckscher-Ohlin two-good, two-country model for Labor and Capital parties that maximize the interests of a representative voter. The probability of a party winning an election is exogenous. In an infinitely repeated game, political parties make sustaining a free trade agreement difficult. When there is a Labor party in relatively labor abundant country 2 (which gains from the free trade agreement), any event that causes an increase in the probability of a Labor party in country 1 could cause defection in country 1 from free trade upon the Labor party gaining power. Given a Capital party in relatively capital abundant country 1 (which would agree to free trade), any political change that increases the probability of a Capital party in country 2 will undermine the ability to maintain the free trade agreement. This shows that political changes alone can lead to the dissolution of free trade. Given that trade policy is determined by political actors, free trade will be very difficult to maintain in the long run.

INTRODUCTION

A two-country general equilibrium trade model is used where trade policies affect the domestic economy through both consumption and tariff revenue effects. Production effects are not included in order to simplify the model. Free trade agreements are examined in an infinitely repeated game setting where grim trigger mechanisms are used as the punishment for any deviation from the agreement. If the agreement is voluntarily sustainable by both the capital and labor party when facing a foreign country with a stable government (either the capital or labor party in power abroad) then the agreement is viewed as politically viable in the long-run. If a change in domestic politics causes the country to back out of the free trade agreement, then this agreement could not be viewed as politically stable.

The implications of this work are clear. Over time, structural economic changes often cause changes in political structure of a country. When examining the ability to maintain long-run free trade agreements, these possible shifts need to be considered. Given this, it is not surprising that when accounting for possible political changes within one or both countries, this model predicts that over an infinite time horizon free trade agreements are not likely to be politically viable. This adds an additional dimension to the previous work on the factors that make long term trade agreements between countries so difficult.

This issue is of particular importance with reference to current U.S. free trade agreements. NAFTA will most certainly entail structural changes within the Mexican and US economies. This might then lead to significant political changes. While many view NAFTA as an agreement that will last in the long-run due to the economic interdependence between the U.S. and Mexico, this work points out that it might be very difficult to sustain this agreement in the face of possible political changes.

The effects of various types of uncertainty have been recognized in the literature, including unobservable tariffs with terms of trade shocks, and private information about domestic political pressure groups and objective functions of the home country. Feenstra and Lewis (1991) examine negotiated trade restrictions when the home country has private information about political pressure groups. They then determine incentive-compatible trade policies. However, they use a cooperative model and assume that a country is able to maintain long-term agreements. Riezman (1991) finds that in a non-cooperative setting, free trade agreements can be achieved even under conditions of uncertainty over the level of the other country's protection. However, unobservable tariff levels can prevent free trade and cause temporary tariff conflicts when random terms of trade shocks occur. Jensen and Thursby (1990) and Bac and Raff (1997) both study games in which a government has private information about its own objective function. The former determines when a low tariff type government might misrepresent itself to gain in tariff negotiations and the resulting impacts on tariffs. The latter extends the analysis into a fully dynamic, infinitely repeated game where agreements must be self-enforcing. They find that low discount factors, large volume of trade, and high (low) marginal costs when original export subsidies are low (high) make cooperative agreements less likely to occur. Stahl and

Turunen-Red (1995) examine political uncertainty where the probability of electoral success is exogenously determined. It is this source of uncertainty that affects the ability of countries to sustain long-term free trade agreements in a non-cooperative setting.

This paper utilizes the Stahl and Turunen-Red approach to political uncertainty. They use a partial equilibrium model where the political parties represent the interests of consumers and producers. Magee, Brock and Young (1989) find data suggesting that when analyzing long-run trade policies, a full general equilibrium model should be used. Therefore, a general equilibrium model is used here with exogenously determined probabilities of election for the labor and capital parties in both countries. As in Stahl and Turunen-Red, the fact that political regimes can change makes free trade agreements difficult to sustain.

THE MODEL[1]

There are two countries using two factors of production, labor and capital to produce two goods using fixed coefficient technologies. Countries differ only in their endowments of capital. Therefore, based on the Heckscher-Ohlin theorem (Jones 1956) the capital abundant country, country 1, will export the capital-intensive good B as determined by unit input requirements. Full employment of all factors is assumed.

Supply is then determined as a function of capital and unit input requirements only[2]. Figure 1 illustrates that this set up results in five relevant production zones: both corner solutions, the kink solution (a unique interior solution) and the indeterminate interior solutions indicating production on the line segments between the corner solutions and the kink. Factor returns as a function of the price are determined using unit cost curves in each country and parametric requirements ensure that both are positive.

In both countries, households with identical utility functions with respect to the two goods are grouped together. The basic relationship between a household's income and factor endowments is also given. Households are assumed to own one unit of labor and can differ in the level of capital holdings. It is assumed that tariff revenue (or subsidy costs) would be distributed equally across households. Individual demand curves are determined and then the integral taken over all groups to determine the market demand curves. Given the particular form of the household utility functions, the entire model can be solved in terms of good A. Income only affects the demand for good B in this model given the function form of the households' utility functions. It is assumed that in each country the quantity consumed is less than or equal to the total availability of the good from both domestic and foreign sources.

The solution to the model involves checking all general equilibrium conditions. It is assumed that there are no cross-shipments of goods between countries (there is no intra-industry trade). Each country can impose an import tariff or subsidy and an export tariff or subsidy. This allows the maximum amount of freedom for a country to use trade policies to achieve import and export objectives. This process determines the equilibrium price for good A, wages and rental rates, and imports and exports in both countries.

Indirect utility functions for each group of households is a function of the price of good A, the wage rate, rental rates times household capital holdings, and average tariff revenue (subsidy cost). Indirect utility is decreasing in price of good A, increasing in wage rate, rental rate, level of household capital holdings, tariff and net imports (decreasing in subsidy). In addition, wage rates are increasing in the price of good A and rental rates are decreasing in the price of good A since good A is the labor-intensive good. The transformed indirect utility function for household h in country i ($\tilde{V}_{h_i}$) becomes

$$\tilde{V}_{h_i} = \frac{(D - p_i)^2}{2} + p_i y_{h_i} + t_i m_i \quad (1)$$

where D is a constant in the demand function, p_i is the price of good A in country i, y_{h_i} is the level of output of good A desired by household h in country i, (this value decreases in the level of capital holdings of a household since good A is the labor-intensive good), $t_i m_i$ is the households average share of the tariff revenue (subsidy cost).

[1] It is not intended in this paper to give the complete specifications for the model. These are very elaborate due to the number of parametric situations that must be evaluated. In this paper I would like to give a general description of the model for comments on the type of model and process used for analysis. For a full description of the model see Hofer (1997).

[2] The assumption that supply is independent of the price was utilized to contain the effects of tariffs to consumption and tariff revenue effects only. While including a production effect would enhance the model's properties, it will be shown that the number of simplifying assumptions necessary to find a solution to the model is already very numerous. Therefore, it was decided in the interests of clarity to eliminate the effect of prices on production. This model should be viewed as illustrative rather than conclusive. However, it does, as we will see, yield some striking insights.

THE POLITICAL MODEL

There are two political parties in each country, a Labor party and a Capital party. The Labor party's indirect utility function is that of the representative household with no capital holdings. Their level of y_{h_i} in equation (1) is therefore the maximum output of the labor-intensive good A. The Capital party maximizes the indirect utility of the representative household associated with the maximum level of household capital holdings. The party's level of y_{h_i} is therefore zero. That would ensure maximum output of the capital-intensive good B.

Tariffs or subsidies (negative tariffs on imports or exports) affect the political party's indirect utility through three effects. The first is the Consumption Effect. If the change in policy raises the domestic price of good A, this harms the representative household and hence lowers party utility. The second is the Factor Return Effect. If the change in policy leads to an increase in the price of good A this benefits the Labor party. In this model, the Capital party has no Factor Return Effect. This is indicated by a level of y_{h_i} equal to zero. The third is the Net Tariff Revenue Effect. This includes both a direct and indirect effect. An increase in a tariff raises tariff revenue directly and therefore benefits the party's representative household directly. A subsidy or an increase in a subsidy harms the party. If a tariff is increased, this reduces imports. That causes a reduction in tariff revenue and hence harms a party's representative household.

NASH EQUILIBRIUM AND ONE-SHOT GAME OUTCOMES

Using the above information, the Nash equilibrium prices are determined. These are function of the tariff levels in each country. Given the indirect utility function, optimal tariff rates are found for each party in each country as a function of the tariff in the other country. These can then be used to calculate the Nash equilibrium tariffs in each country based on the parties in power.

When there are Capital parties in both countries, the countries' trade policies result in autarky. This also occurs when there are Labor parties in both countries. Note that while prices and trade are the same as those under two Capital parties, the Labor party has higher utility than the Capital party because it gains from the higher wages caused by the higher domestic prices under autarky. The autarky outcome in these two cases arises because the parties in power are pursuing opposing trade policies. For example, under two Labor parties country 1 is trying to use trade policy to shift the trade patterns so county 1 can export the labor-intensive good. At the same time, the Labor party in country 2 is attempting to use trade policy to stimulate exports of the labor-intensive good. These extreme policies on both sides drive trade down to zero.

Under a Labor party in country 1 and a Capital party in country 2, the countries' trade policies cause country 1 to export good A to country 2. Country 1 imposes an export subsidy and country 2 imposes an import subsidy. In this case both governments are working towards the same objective, to increase country 1's exports of the labor-intensive good. This obviously results in the highest level of trade over the possible political configurations.

Under a Capital party in Country 1 and a Labor party in Country 2, country 1 imports good A from country 2. Again the policies of the two governments are complementary in obtaining their objectives, an increase in country 1's imports of the Labor-intensive good. This results in levels of trade only matched by that under the Labor party in country 1 and the Capital party in country 2.

INFINITELY REPEATED GAME AND SUSTAINABILITY OF FREE TRADE

While it can be shown that free trade maximizes total welfare in both countries, the political Nash equilibrium outcomes do not achieve that objective. Therefore, cooperation will be necessary to achieve free trade. Free trade agreements will be sustainable in an infinitely repeated game if the expected discounted utility stream for each party in each country under free trade is greater than or equal to that if there were no cooperation. Under these conditions, grim trigger strategies will ensure compliance to the agreement (Friedman, 1971).

Many authors have used repeated game settings to examine international trade issues. These include Dixit (1987), Riezman (1991), Bagwell and Staiger (1990), Bac (1997) and Stahl and Turunen-Red (1985). In this paper, the structure of the game is such that in each period, the one-period game is repeated, with all trade policies fully observable in each country. A strategy for any party in the game is a function from the history of the game to the trade policy chosen by that party. The relevant history for the game includes all past election outcomes, the trade policies chosen and the most recent election results. The outcomes of the elections are random and captured by the probabilities of a Labor party victory in each country (P_1, P_2).

Each party chooses its trade policy to maximize its expected discounted utility stream. It is assumed that the parties in each country have the same discount parameter $\beta \in [0,1)$. The expected discounted utility stream for each party is therefore

$$\sum_{n=0}^{\infty} \beta^n EU_g^i(n) \text{ where } i = 1,2 \text{ and } g = L, K .$$

$EU_g^i(n)$ represents the expected utility in country i of party g in period n. Let $\Gamma(\mathrm{P}i, \beta; i = 1,2)$ describe the infinitely repeated fame. Then a strategy where players are given their one period Nash Equilibrium in every time period is a subgame perfect Nash Equilibrium (SPNE) of this repeated game. Grim trigger strategies are used as the enforcement of the free trade agreement. If the expected utility stream under the agreement is greater than or equal to that under the grim trigger strategies then free trade is sustainable as a SPNE of the repeated game.

To compare the utility streams for each party in each country, the differences between the expected indirect utility under free trade and the expected indirect utility under the myopic Nash Equilibria are compared. If this difference is non-negative, then that party would adhere to the free trade agreement under the threat of grim trigger strategies. If this difference is negative, the party has an incentive to violate the agreement and move to the myopic Nash Equilibrium outcomes. Since both countries have political parties, the expected gains from free trade are a function of the domestic and foreign probability of a Labor party government. These gains are then evaluated at the limit as the probability of a Labor party victory approaches 0 and 1 in each country. This leaves four cases to be examined.

When the probability of a Labor party is high in both countries (P_1 and P_2 approach 1) free trade is not sustainable. The gains to the Labor party in country 1 from free trade are negative. This is due to the fact that while free trade lowers the price of good A, increasing consumer surplus, it also lowers factor returns to the Labor party. In this case, the loss of factor returns outweighs the gain in consumer surplus. There are no tariff revenue effects from the move to free trade because the Nash Equilibrium resulted in autarky. So county 1 would not maintain the free trade agreement. It should be noted that country 2 would abide by the free trade agreement.

When there is a high probability of Capital party governments in both countries (P_1 and P_2 approach 0) the capital party in country 1 is willing to maintain the free trade agreement if the two countries are sufficiently dissimilar (in terms of capital endowments). However, the Capital party in country 2 would not maintain the agreement. Free trade increases the price of good A and that lowers consumer surplus. Since there are no factor return effects and tariff revenue effects (starting from a point of autarky) the Capital party would not commit to the agreement.

When the probability of a Labor government in country 1 is high and the probability of a Capital government in country 2 is high (P_1 approaches 1 and P_2 approaches 0) the Labor party in country 1 would not maintain the free trade agreement. There is a positive trade revenue effect from the move to free trade (country 1 exports good A and imposes an export subsidy) and a gain in consumer surplus from the lower price of good A. However, this is outweighed by the negative effect of lower returns to wages. Similarly, the Capital party in country 2 would not be willing to move to free trade since the loss of consumer surplus is larger than the gains in tariff revenue (when import subsidies are removed).

Under a high probability of a Capital party in country 1 and a Labor party in country 2 (P_1approaches 0 and P_2 approaches 1) free trade could be sustained if country 1 and country 2 are sufficiently dissimilar (based on capital endowments). The Capital party in country 1 would gain from the move to free trade due to the increase in consumer surplus outweighing the lost tariff revenue. In country 2, the Labor party would also gain. Therefore, this is the only scenario under which free trade could be voluntarily sustained.

CONCLUSION

This work has developed a new approach to analyzing the effect of political variability on free trade agreements. It shows that political parties make maintaining free trade agreements very difficult. In only one case, a high probability of Capital party in country 1 and a high probability of a Labor party in country 2 will free trade be able to be sustained in an infinitely repeated game. This model can also be used to examine the effects of changes in the probability of election on free trade agreements.

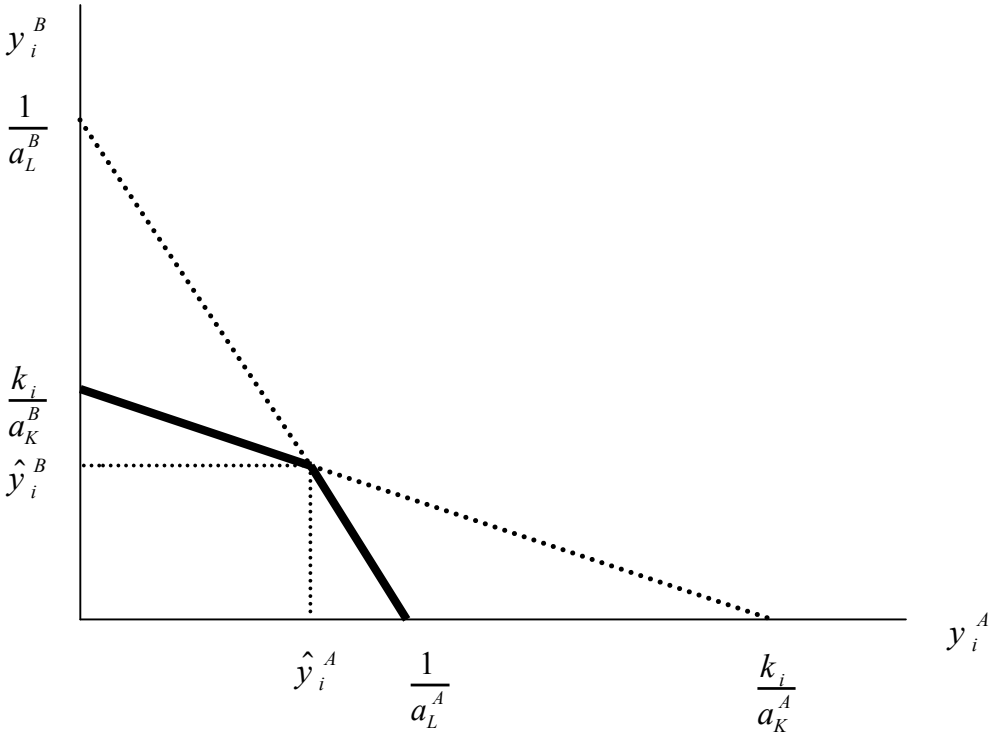
Suppose there is a Labor party in relatively labor abundant country 2 which gains from the free trade agreement. Any event that causes an increase in the probability of a Labor party in country 1 could cause defection in country 1 from free trade upon the Labor party gaining power. Given a Capital party in relatively capital abundant country 1 which would agree to free trade, any political change that increases the probability of a Capital party in country 2 will undermine the ability to maintain the free trade agreement.

An additional issue to be examined in the future is whether internal side payments could be used between the two parties within a country to maintain the agreement. For example, if the gains to the Capital party in country 1 are large enough it may able to pay off the Labor party to ensure continuation of a free trade agreement if that party was to come into power.

An even more interesting use of this methodology would be to encorporate a dynamic international trade model. This would show how free trade can lead to income transfers between trading partners. If the probability of election was endogenously determined, this could be used to explain how trade policies can cause political changes that in turn affect trade policies.

While many types of uncertainty contribute to the difficulty in maintaining international agreements, this model clearly indicates that political variation needs to be added to this list. It is more difficult to prescribe a solution that will result in country welfare enhancing free trade policies. While economists like to use models with a benevolent dictator as the primary agent that maximizes country welfare, this is certainly not illustrative of the politicized world in which trade decisions are made. It is clear that special interests have every reason to back policies that enhance their economic well being at the expense of the whole. It is also well know that politicians to some degree will acknowledge these requests. This paper simply states that political parties in and of themselves will make long-term free trade agreements between countries very unlikely.

FIGURE 1: PRODUCTION POSSIBILITIES FRONTIER (EACH COUNTRY)



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