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Bilateral international agreement, cooperation and reneging

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ABSTRACT

We consider two democratic countries, where each of country's government has to decide whether to sign a bilateral agreement to produce a public good where both countries' citizens will benefit. The production cost is funded by tolls charged by each country to those citizens who are using the public good. The bilateral agreement can be based on two alternatives: (i) a non-cooperative agreement and (ii) a cooperative agreement. Both alternatives have the same constraint of the status-quo i.e. at least half of the citizens must be satisfied with the agreement so that ruling party can ensure that it can be re-elected under the pair wise voting rule. In this setup, we find that the non-cooperative agreement is dominant over the cooperative agreement in terms of welfare. Later, we drop the status quo constraint from the cooperative agreement and find that (a) under symmetric benefit case (i.e. where both countries have the same level of benefit from a public good), the non-cooperative agreement is weakly dominant over the cooperative agreement in terms of welfare; and (b) under the asymmetric benefit case the complete cooperation is not possible. Finally, we show that, under certain conditions, the welfare of the Nash Bargaining Solution (NBS) is equivalent to the welfare of non-cooperative agreement with the status-quo. Furthermore, although the welfare of NBS is higher under asymmetric expected benefits, it is possible that one ruling party loses its majority votes as the majority are not satisfied with the bilateral agreement. Therefore, ex-post, it is possible that one country will renege on such a cooperative agreement.

1. Introduction

Bilateral trade agreements are very common amongst trading partners in the world economy. Such bilateral trade agreements are taking place where the outcomes are mostly uncertain; and once the uncertainty is over – very often at least one partner country wants to renegotiate the existing trade agreement (Maggi & Staiger, 2015). Indeed, Maggi and Staiger (2015) have analysed the two rules, the 'property rule' and the 'liability rule', on bilateral trade agreements where the former rule gives the right either to the importing country to protect itself from free trade or to the exporting country to promote free trade. On the other hand, the latter rule provides the importing country with an option to practise free trade or to adopt protection from free trade and compensate the exporters with a certain amount of damages. Maggi and Staiger (2015) conclude that the optimal contract regarding bilateral agreement is either the 'property rule' or the 'liability rule', and more importantly the renegotiations under each types of rule lead to more trade liberalisation.

Recently with Brexit and US withdrawal from the Trans-Pacific Partnership (TPP), we have observed that the renegotiation of the trade agreements has failed. One of the important common features in the above cases is that there exists a growing perception amongst

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of a majority people of each country that such an agreement may involve the loss of 'economic sovereignty' (Richardson and Stahler, 2017). Indeed, Richardson and Stahler (2017) show that complete cooperation is never possible in any international trade agreement and the break down of (or the exit from) an international agreement can not be completely avoided. Clearly, Unlike Maggi and Staiger (2017), Richardson and Stahler (2017) are not optimistic about some international trade agreements such as Brexit and US withdrawal from the TPP.

While Richardson and Stahler (2017)'s analysis has identified correctly that a country's welfare (generated by the trade agreement) influences the perceptions of the people, they do not consider the strategic interaction between two countries, which also plays an important role in any international trade agreement. More importantly, both Maggi and Staiger (2015) and Richardson and Stahler (2017) fail to acknowledge the fact the bilateral international agreement may be based not only on trade but also on the joint production of a public good where both countries' citizens can be better off from the consumption of that public good. Indeed, these features motivate our paper.

We consider two democratic countries, where each of the country's government has to decide whether to sign a bilateral agreement to produce a public good where both countries' citizens will benefit. The production cost is funded by tolls charged by each country to those citizens who are using the public good. The bilateral agreement can be based on two alternatives: (i) a non-cooperative agreement and (ii) a cooperative agreement. Both alternatives have the same constraint of the status-quo i.e. at least half of the citizens must be satisfied with the agreement so that ruling party can ensure that it can be re-elected under the pair wise voting rule. In this setup, we find that the non-cooperative agreement is dominant over the cooperative agreement in terms of welfare. Later, we drop the status quo constraint from the cooperative agreement and find that (a) under the symmetric benefit case (i.e. where both countries have the same level of benefit from a public good), the non-cooperative agreement is weakly dominant over the cooperative agreement in terms of welfare; and (b) under the asymmetric benefit case (i.e. one country's benefit from a public good is higher than the other country's benefit from the same public good), the complete cooperation is not possible. Finally, we show that, under certain conditions, the welfare of the Nash Bargaining Solution (NBS) is equivalent to the welfare of non-cooperative agreement with status-quo. Furthermore, though the welfare of the NBS is higher under asymmetric expected benefits, it is possible that one ruling party loses its majority votes as the majority are not satisfied with a bilateral agreement. Therefore, ex-post, it is possible that one country will renege on such a cooperative agreements.

An Example that may fit our model is the English Channel tunnel which itself is a public good. The tunnel links Folkestone in the United Kingdom and Coquelles (near Calais) in northern France. Both Governments are charging tolls to tunnel users at two different points of entry. The first proposal to build the tunnel was raised in 1802, however, the agreement between UK and Friance took place in 1986 and the tunnel was opened in 1994 for commercial use. Although it was forecasted that the tunnel would be beneficial for both nations, in reality it did not achieve its targeted benefit (Anguera, 2006). Furthermore, Thomas and O' Donoghue (2013) have found an evidence of asymmetric benefits where East London is mostly the gainer but the rest (including France) are not gaining as much as forecasted. Furthermore, the riots that broke out in 2001 at the tunnel in France (because of the belief that the tunnel leads to an increase the number of illegal immigrants in France) has caused huge damages. Note that, like the English Channel tunnel, there are various roads and railways that connect two countries and are examples of public goods which are produced by two countries' governments through bilateral international agreement.

Section 2 provides the basic set-up of our model, section 3 and 4 analyse both non-cooperative and co-operative agreements respectively and section 5 concludes.

2. Model

Two democratic countries E and F have an agreement to provide a public good, which benefits to their citizens. In so doing, each country chooses a price or toll rate for its citizens who consume the public good. Note that, an individual country chooses a toll rate to maximise its govt. revenue to fund the project. For example, one can think of the English Channel tunnel, where the travellers who are utilising the tunnel have to pay tolls to both countries. We assume that if an individual country fails to reach an agreement then it will receive utility $\overline{U}_0$, which we normalise to zero. In trying to reach an agreement, country E and F have two alternatives: (i) a non-cooperative agreement and (ii) a cooperative agreement. In the former agreement, each individual country interacts strategically with the other in choosing the toll rates, while they are trying to reach an agreement; and in the latter agreement such strategic interaction is absent. Country E and F choose the tolls (i.e. prices) $x > 0$ and $y > 0$ respectively, which are costly to their citizens.[2]

The benefits from the bilateral agreement of producing a public good for country E and F are a and b respectively, where a and b are both random variables. Let each of these random variables be normally distributed over a support $[k,l]$. Therefore, the expected benefits of country E and F are $E(a) = A$ and $E(b) = B$ respectively.

Each country i, where $i \in \{E,F\}$, has $Z > 0$ number of citizens (which we normalise to 1), whose preference, δ_i, regarding the bilateral agreement is uniformly distributed over an interval $[0, 1]$. Given each countries' expected benefit, one can derive the utility of an individual citizen of each country as follows:

$$U_i = \begin{cases} \delta_i A - x - m.y & (\text{if } i \in E); \\ \delta_i B - y - m.x & (\text{if } i \in F). \end{cases} \tag{1}$$

[2] Here, we use the term toll or toll rate as a price of a public good. Furthermore, this is not a two part tariff case i.e. there is no nonlinear pricing rather our model follows the essence of Bertrand price competition in a Duopoly set-up.