STRATEGIC TRADE POLICY WITH ASYMMETRIC BARGAINING AGENDA

ABSTRACT

This paper challenges the conventional wisdom of the strategic trade policy – in which governments set subsidies for their own exporter firms – under unionisation by considering the realistic difference in the labour market institutions between producing countries, i.e. asymmetric bargaining agenda (Efficient Bargaining, EB, and Right-to-Manage, RTM) in rival firms. We show that 1) the government whose firm is EB (resp. RTM) always finds convenient to set an export tax (resp. an export subsidy), regardless of whether the other government intervenes; 2) an asymmetric equilibrium emerges in which only one government intervenes; 3) under appropriate side-payments, governments would find beneficial to coordinate either over mutual intervention or free trade, with the latter ensuring higher welfare levels; 4) the asymmetric equilibrium is preferred by the RTM country because its national social welfare under intervention is always higher than under free trade. These results show that active trade policies in the RTM country partially solve the classical Prisoner's Dilemma of the trade policy game.

Keywords: Export Subsidy/Tax, Efficient Bargaining, Right-to-Manage, Cournot Duopoly, Asymmetric Equilibrium

JEL Classification: F16, J51, L13

RIASSUNTO

Politica commerciale strategica in presenza di agende di contrattazione asimmetriche

Questo articolo mette in discussione la visione tradizionale in tema di politiche commerciali strategiche nelle quali gli Stati stabiliscono i sussidi alle proprie imprese esportatrici tenendo conto delle differenze nelle istituzioni del mercato del lavoro. Si dimostra che: 1) il governo del Paese in cui l'impresa adotta la contrattazione efficiente (rispettivamente, con diritto di gestione) trova sempre ottimale stabilire una tassa all'esportazione (rispettivamente, un
sussidio all’esportazione), indipendentemente dal fatto che il governo dell’altro Paese sia interventista; 2) emerge un equilibrio asimmetrico in cui un solo governo è interventista; 3) considerando la possibilità di pagamenti collaterali, i governi troverebbero vantaggioso coordinarsi o su reciproco intervento o su libero scambio, con quest’ultimo che garantirebbe un benessere maggiore; 4) l’equilibrio asimmetrico è preferito dal Paese con la negoziazione con diritto di gestione, nel senso che il suo benessere sociale in caso di intervento è più alto rispetto al libero scambio. Questi risultati dimostrano che le politiche commerciali attive del Paese con l’istituzione della contrattazione con diritto di gestione risolvono parzialmente il classico Dilemma del Prigioniero del gioco della politica commerciale strategica.

1. INTRODUCTION

This paper develops a model of ‘export rivalry’ between two countries for a homogeneous product (so far considered in a context in which both firms are either unionised or not) in a context in which different arrangements are in place in the unionised labour markets.

To study the interconnections among those two aspects of contemporary economics is timely and extremely relevant. In fact, on the one hand, a discussion on whether free trade or trade policies are suitable to improve the national welfares of countries engaged in international trade is reappearing high on the political agendas. For example, while the Obama administration has been supporting bilateral free-trade agreements with Colombia, Panama, and South Korea, and advancing negotiations on two immense regional multi-lateral agreements such as the Asia-centered Trans-Pacific Partnership and the Transatlantic Trade and Investment Partnership with the European Union, the Trump administration has decided to reassess those advancements with the opportunity of introducing some trade policies (see Scott and Glass, 2016; Scott, 2016). On the other hand, the labour markets can show different arrangements in the different firms, either of the Right-to-Manage (RTM) type (Nickell and Andrews, 1983) in which the union negotiates with the firm the wage, and then the firm chooses employment subject to that wage; or Efficient Bargaining (EB) type (McDonald and Solow, 1981) in which employment and wages are both negotiated among firms and unions. As Calmfors (1993) states,

“it is unrealistic to expect one universally optimal set-up of bargaining institutions to exist for all countries. Because of varying historical traditions and structural characteristics of different economies, different wage-setting institutions”
may be the rule. For instance, an OECD economic outlook (OECD, 2012, Ch. 2) argues that some countries seem to be characterised by flexible labour markets, low levels of collective wage bargaining coverage, and a predominance of firm-level bargaining such as Estonia, Poland and the United Kingdom, and thus consistent with the RTM model. On the other hand, a second group of countries, such as Belgium, France, Italy and Spain, seems to have less flexible labour markets, high levels of collective wage bargaining coverage, and a predominance of bargaining at the industry or country levels, all aspects that present the specific features of the bargaining process typical of the EB model. Lawson (2011) surveys the empirical literature that have tested the monopoly union model in which the union is limited to choosing a point on the firm’s labour demand curve, and which can be treated as a polar case of the RTM model in which the union has full bargaining power, against the McDonald and Solow’s (1981) model. Various empirical procedures and tests have been attempted, and the author reports that the literature has found diverse, and contradictory range of results, tendentially supporting more the EB model.

Brander and Spencer (1988) developed a model in which the wages in one of the two countries are not exogenously given but instead are the result of a union-firm wage bargaining. Mezzetti and Dinopoulos (1991) take this analysis further, using the ‘efficient bargaining’ model to analyse import competition, by also considering the union’s relative preferences between wages and employment.

Bandyopadhyay and Bandyopadhyay (1999) analysed a right to manage model of export rivalry where the domestic firm is unionised while the foreign firm is non-unionised, to show that while a unionised firm must have a lower market share under free trade, paradoxically, in a exogeneously given subsidy equilibrium, it enjoys a higher market share. Bandyopadhyay and Bandyopadhyay (2001), in the same case in which only the domestic firm is unionised, analysed efficient bargaining (also considering a different degrees of union wage orientation) model of export rivalry, focusing especially on the welfare effects of domestic unionisation in a exogeneously given subsidy equilibrium, showing that the results depend on whether the union is wage oriented, wage neutral or employment oriented.

However, different from the present paper, both latter papers neglect 1) the case in which both firms are unionised but with different labour market arrangements (i.e. EB and RTM); ii) whether the ‘subsidy equilibrium’ is or not the Nash equilibrium with respect to the ‘free-trade
equilibrium’. Thus, this work strongly differs from the above mentioned literature which have abstracted 1) from the cases of the governments’ endogenous policy game; and 2) unionisation in both countries.

Our model is developed in the following way. Two exporting firms (domestic and foreign) are engaged in a Cournot duopolistic competition in homogeneous goods in a third nation’s market. The domestic firm conducts an efficient Nash bargain with its union on wage and employment, while the foreign firm conducts a Nash bargain with its union only on wage. The export goods are not consumed in the exporting countries and not produced in the importing country. In such an industry, each exporter would persuade the rival that it produces the output level such that profits increase at the rival’s detriment. However, each firm should be able to commit to such a production. A government’s export tax/subsidy policy provides the “commitment” that the national firm precisely exports the most profitable output in the third market. In essence, a tax/subsidy policy secures the profitability of the national firm in such a way that it aims to improve the national welfare1.

The Nash equilibrium of the game between the two governments is determined in a non-cooperative four-stage game. In the first stage, each government decides whether to subsidize its own firm. In the second stage governments choose, if any, their respective export subsidy levels. In the third stage, the domestic union and the domestic firm negotiate an efficient contract on wage and employment, while the foreign union and the foreign firm negotiate only on wage. In the fourth stage the foreign firm chooses employment.

We show that the conventional wisdom of the traditional ‘export rivalry’ model is modified under a realistic difference in the labour market institutions between producing countries. Our contribute enriches the vast literature on strategic trade theory which so far has not explored the effects of different labour market institutions.

The rest of this paper is organised as follows. Section 2 presents the duopoly model and provides the equilibrium outcomes under the two institutions (EB and RTM). Section 3 presents the

---

1 However, the government’s commitment to the policy tools cannot constantly be presupposed. If the government cannot commit, the timing of the game will be different: firms move first, therefore anticipating (eliciting) the government’s reaction in the form of tax or subsidy (see e.g. the works of Carmichael, 1987; Leahy and Neary, 1997; and Neary and Leahy, 2000).
strategic game played by national governments and shows the main results. In Section 4, the main results are briefly discussed. Section 5 closes the paper.

2. MODEL SET UP

Following the approach of the Brander-Spencer (1985) model, we consider two exporting countries, each with a firm producing a homogeneous product and selling it to a third country, an importing country. Both firms compete between them on quantity (i.e. a duopolistic Cournot market). The standard linear inverse product demand is given by

\[ p = a - q_j - q_i \]  

where \( p \) denotes price, \( q_i \) and \( q_j \) are the output levels of the two firms. We assume the following production function – identical for both firms – with constant (marginal) returns to labour:

\[ q_i = L_i \]  

where \( L_i \) represents the labour force employed by firm \( i \). The \( i \)-th firm faces an average and marginal cost \( w_i \geq 0 \) for every unit of output produced, where \( w_i \) is the wage per unit of labour.

Country 1 and 2’s governments provide specific export subsidies, \( s_i \), to their producers. If \( s_i < 0 \), the government implements an export tax. Therefore, given eq. (2), the firm \( i \)'s cost function is linear and described by:

\[ C_i(q_i) = w_i L_i - s_i q_i = (w_i - s_i) q_i \]  

\( \Pi_i \) denotes the profits of the \( i \)-th firm, as follows:

\[ \Pi_i = (a - w_i - q_j - q_i + s_i) q_i \]  

We assume that all workers are unionised and there are identical and firm-specific unions. Each union has the following utility function\(^2\):

\[^2\text{This is a specific case of the more general Stone-Geary utility function, i.e., Pencavel (1984):} \]

\[ V = (w - w^o)^\theta L, \]
\[ V_i = w_i L_i \]  

Therefore, by recalling that \( q_i = L_i \), eq. (5) becomes:

\[ V_i = w_i q_i \]  

This means that unions aim to maximise the total wage bill.

We propose a four-stage game, in which the governments of the exporting countries decide on the optimal subsidy to maximise their own welfare (SW):

\[ SW_i = \Pi_i + V_i - s_i q_i \]  

As discussed in the introduction, we assume (conventionally) that the firm/union pair 1 adopts EB while firm/union pair 2 adopts RTM. At stage one, governments decide whether to subsidise. Then, at stage two, governments choose, if any, their respective export subsidy levels. At stage three, firm 1 and union 1 (firm 2 and union 2) bargain over wage and employment (only over the wage), while at stage four firm 2 chooses employment. We assume that the firms choose wage and output levels following the policy decisions that are committed by their respective governments. We solve the game by applying backward induction from the last stage of the game to obtain a Sub-game Perfect Nash Equilibrium (SPNE).

In particular, the timing of firms’ moves modifies the competitive structure of the product market from Cournot to Stackelberg and this has an impact on the governments’ policy decisions aiming at favoring each national firm to become leader in the product market. Given the timing described above, it follows that firm/union pair 1 chooses \( w_1 \) and \( q_1 \) through the maximisation of

\[ \max_{w.r.t. \ w_1, q_1} \ N_1 = (\Pi_1)^{1-b}(V_1)^b = \left[ (a - w_1 - q_1 - R_2(q_1) + s_1)q_1 \right]^{1-b}(w_1 q_1)^b \]  

where \( w^\theta \) is the reservation or competitive wage. A value of \( \theta = 1 \) gives the rent-maximising case (i.e., the union seeks to maximise the total rent); values of \( \theta \) smaller (higher) than 1 imply that the union is less (more) concerned about wages and more (less) concerned about jobs. Moreover, the unions aim to maximise the wage bill when \( \theta = 1 \) and \( w^\theta = 0 \).
taking as given the negotiated wage $w_2$ and firm 2’s optimal response to its employment decision in the subsequent production stage:

$$R_2(q_1) = \frac{a - w_2 - q_1 + s_j}{2} \quad (9)$$

Substituting $R_2(q_1)$ into Eq. (8), taking the first order conditions (F.O.Cs), and solving for $w_1$ and $q_1$ as functions of $w_2$, we get:

$$w_1(w_2, s_1, s_2) = \frac{b[a + (w_2 - s_2) + 2s_1]}{4} \quad (10)$$

$$q_1(w_2, s_1, s_2) = \frac{[a + (w_2 - s_2) + 2s_1]}{2} \quad (11)$$

Note that an increase in the negotiated wage of firm/union bargaining unit 2 increases the negotiated wage as well as the employment for firm/union bargaining unit 1.

On the other hand, firm/union bargaining unit 2 chooses $w_2$, taking also into account the own optimal output response in the subsequent production stage, $R_2(q_1)$, by maximising its Nash product:

$$\max_{w_2} N_2 = (\Pi_2)^{1-b} (V_2)^b = \left[\left(a - w_2 - q_1 - R_2(q_1) + s_2\right)R_2(q_1)\right]^{1-b} \left[w_1 R_2(q_1)\right]^b \quad (12)$$

for given $q_1, w_1$, yielding the wage reaction function to the rival’s employment

$$w_2(q_1, s_1, s_2) = \frac{b(a - q_1 + s_2)}{2} \quad (13)$$

As firm/union 2 pair conducts right-to-manage bargaining, while firm/union 1 pair conducts bargaining simultaneously over wage and employment, firm 2 becomes a Stackelberg follower in the product market. This means that the gain due to the leadership in the output market allows firm/union pair 1 to have a larger joint gain than the case in which they choose RTM bargaining.

Note from Eq. (13) that the higher the level of employment chosen by firm/union pair 1 at the first stage, the lower the wage chosen by firm/union pair 2 in order to preserve profitability and
employment. Solving the system of linear equations – eqs. (10)-(11) and eq. (13) – we obtain a unique solution of wages and quantity as functions of only subsidies:

\[ w_1(s_1, s_2) = \frac{b[4(a + s_1) - (2 - b)(a + s_2)]}{2(4 + b)} \]  

(14)

\[ w_2(s_1, s_2) = \frac{b[3(a + s_2) - 2(a + s_1)]}{4 + b} \]  

(15)

\[ q_1(s_1, s_2) = \frac{4(a + s_1) - (2 - b)(a + s_2)}{4 + b} \]  

(16)

\[ q_2(s_1, s_2) = \frac{(b - 2)[2(a + s_1) - 3(a + s_2)]}{2(4 + b)} \]  

(17)

\[ \Pi_1(s_1, s_2) = \frac{(1 - b)[4(a + s_1) - (2 - b) + (a + s_2)]}{2(4 + b)^2} \]  

(18)

\[ \Pi_2(s_1, s_2) = \frac{(2 - b)^2[2(a + s_1) - 3(a + s_2)]^2}{4(4 + b)^2} \]  

(19)

Each government chooses the value of \( s_i \) which maximises the social welfare \( SW \) (eq. 7). By solving the system of export subsidy reaction functions, we obtain that in equilibrium the trade policies parameters are given by, respectively:

\[ s_1 = -\frac{ab}{4(3 + b)} \]  

(20)

\[ s_2 = \frac{a(2 + b)(1 + b)}{(2 - b)(3 + b)} \].  

(21)

Direct observation of eqs. (20) and (21) reveals that the government of the country in which the EB institution is in place sets an export tax, while the government of the country with the RTM institution sets an export subsidy. The intuition behind this result is as follows. In the current framework, the firm in the country with the EB institution is a Stackelberg leader in the choice of quantity while the firm in the country with RTM is a follower. Acting as (if it was) an output Stackelberg leader, firm 1 expands production and, as a consequence, the price tends to lower.
Anticipating this, the government in country 1 taxes exports, so that firm 1 shrinks production and, via taxation, the price of the exported goods is sustained. This allows the union in country 1 to negotiate a higher wage (duopoly rents increase) and, due to strategic complementarity in wage setting, the union in country 2 with the RTM institution demands a higher wage as well. However, the government in country 2 anticipates the union’s move and subsidizes exports, so that firm 2’s costs lower and increases its competitiveness.

By exploiting (20) and (21) and recalling (14)-(15), after the usual algebra, the equilibrium values of wages are:

\[ w_1 = \frac{ab}{2(3+b)} \] (22)

\[ w_2 = \frac{3ab(2+b)}{2(2-b)(3+b)} \] (23)

Then, output, profits and social welfare are derived (where the superscript S denotes the case with trade policy) and resumed, together with those of the case of free trade (FT) \(^3\), in Tables 1, 2 and 3 in next section 3.

3. THE STRATEGIC GAME PLAYED BY NATIONAL GOVERNMENTS

Now, at the first stage, we develop the game between the two governments. Each of them may decide whether to subsidize or not. In order to determine the sub-perfect Nash equilibrium (SPNE) of this game we have to evaluate governments’ pay-offs in the mixed case, in which one subsidizes while the other one allows free-trade.

We develop the cases in which government 1 (resp. government 2) subsidizes, while government 2 (resp. government 1) does not intervene, that is \( s_2 = 0 \) (resp. \( s_1 = 0 \)). Standard calculations based on the opportunely modified (14)-(19) and the maximisation by government 1 (resp. government 2) of its social welfare leads to the following subsidy rate for firm 1 (resp. firm 2):

\[ s_1 | s_2 = 0 = \frac{ba}{8} \] (24)

\(^3\) The equilibrium outcomes under free-trade are easily obtained by setting \( s_1 = s_2 = 0 \) in (10)-(14).
By exploiting (24) and (25) and recalling (14)-(19), after the usual algebra, the equilibrium values of wages are:

\[ w_1|s_2 = 0 = \frac{ab}{4} \]  \hspace{1cm} (26)

\[ w_2|s_2 = 0 = \frac{ab}{4} \]  \hspace{1cm} (27)

\[ w_1|s_1 = 0 = \frac{ab}{6} \]  \hspace{1cm} (28)

\[ w_2|s_1 = 0 = \frac{ab}{2 - b} \]  \hspace{1cm} (29)

By substituting backwards (24) (and \( s_2 = 0 \)) (resp. (25) and \( s_1 = 0 \)) in (14)-(19) we obtain quantities, profits and social welfares of countries 1 and 2, as reported in tables 1, 2, and 3.

**TABLE 1 - Output Matrix**

<table>
<thead>
<tr>
<th>Firm 1</th>
<th>Firm 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>FT</td>
<td>FT</td>
</tr>
<tr>
<td>( q_1^{FT,FT} = \frac{a(2 + b)}{4 + b} ), ( q_2^{FT,FT} = \frac{a(2 - b)}{2(4 + b)} )</td>
<td>( q_1^{FT,S} = \frac{a}{3} ), ( q_2^{FT,S} = \frac{a}{2} )</td>
</tr>
<tr>
<td>( q_1^{S,FT} = \frac{a}{2} ), ( q_2^{S,FT} = \frac{a(2 - b)}{8} )</td>
<td>( q_1^{S,S} = \frac{a}{3 + b} ), ( q_2^{S,S} = \frac{3a(2 + b)}{4(3 + b)} )</td>
</tr>
</tbody>
</table>
Table 2 - Profit Matrix

<table>
<thead>
<tr>
<th>Country 2</th>
<th>FT</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Country 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FT</td>
<td>$\pi_{1,FT}^{FT} = \frac{a^2(2+b)(1-b)}{2(4+b)^2}$, $\pi_{2,FT}^{FT} = \frac{a^2(2-b)^2}{4(4+b)^2}$</td>
<td>$\pi_{1,FT}^{S} = \frac{a^2(1-b)}{18}$, $\pi_{2,FT}^{S} = \frac{a^2}{4}$</td>
</tr>
<tr>
<td>S</td>
<td>$\pi_{1,FT}^{S} = \frac{a^2(1-b)}{8}$, $\pi_{2,FT}^{S} = \frac{a^2(2-b)}{64}$</td>
<td>$\pi_{1}^{S,S} = \frac{a^2(1-b)^2}{2(3+b)^2}$, $\pi_{2}^{S,S} = \frac{9a^2(2+b)^2}{16(3+b)^2}$</td>
</tr>
</tbody>
</table>

Table 3 - Social Welfare Matrix

<table>
<thead>
<tr>
<th>Country 2</th>
<th>FT</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Country 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FT</td>
<td>$SW_{1,FT}^{FT} = \frac{a^2(2+b)^2}{2(4+b)^2}$, $SW_{2,FT}^{FT} = \frac{a^2(2-b)(2+b)}{4(4+b)^2}$</td>
<td>$SW_{1,FT}^{S} = \frac{a^2}{18}$, $SW_{2,FT}^{S} = \frac{a^2}{12}$</td>
</tr>
<tr>
<td>S</td>
<td>$SW_{1,FT}^{S} = \frac{a^2(2+b)}{16}$, $SW_{2,FT}^{S} = \frac{a^2(2-b)(2+b)}{64}$</td>
<td>$SW_{1}^{S,S} = \frac{a^2(2+b)}{4(3+b)^2}$, $SW_{2}^{S,S} = \frac{3a^2(2+b)^2}{16(3+b)^2}$</td>
</tr>
</tbody>
</table>

4. MAIN RESULTS

First, we investigate if at the equilibrium it would be optimal to fix a tax or a subsidy for each country.

**Lemma 1.** Government 1 (resp. 2) always finds optimal to set a tax (resp. a subsidy), regardless of whether the other government intervenes. Proof: by simple inspection of (20), (21), (24) and (25).

This means that, in any exogenously given regime, the country with the EB institution always fixes a tax on its exporter firms, while the government’s country with the RTM institution always provides a subsidy for its exporter firm.
However, it remains to analyse the endogenous emergence of the governments’ policy regime. Now we are in a position 1) to solve for the sub-perfect Nash equilibrium (SPNE) of the game represented in Table 2; and 2) to investigate the efficiency properties of the emerged SPNE. Let us define the following six differentials:

\[
\begin{align*}
\Delta_{1,1} &= SW_1^{FT/S} - SW_1^{FT/FT}, \quad \Delta_{2,1} = SW_1^{FT/S} - SW_1^{S/S}, \\
\Delta_{1,2} &= SW_2^{FT/S} - SW_2^{FT/FT}, \quad \Delta_{2,2} = SW_2^{S/FT} - SW_2^{S/S}, \\
\Delta_{3,1} &= SW_1^{S/S} - SW_1^{FT/FT}, \quad \Delta_{3,2} = SW_2^{S/S} - SW_2^{FT/FT}.
\end{align*}
\]

**Result 1.** In an export-rivalry model with asymmetric bargaining agenda between firms there is always an asymmetric equilibrium, that is \(FT/S\).

*Proof: since \(\Delta_{1,1} > 0, \Delta_{2,1} > 0, \Delta_{1,2} > 0, \Delta_{2,2} < 0\), then result 1 follows.*

This result changes the standard result of the Brander and Spencer’s models in which both governments subsidise their companies. In our framework, only one of the two countries designs a trade policy intervention (export tax in the RTM country) while the rival government commits to free trade. The intuition behind this finding is the following. Consider the case of the export subsidy in the RTM country. The provision of the export subsidy expands the RTM firm output, leading both to a fall in the price for the goods, which reduces oligopoly rents and, consequently, the RTM union’s wage demand. Due to strategic complementarity, also the EB union negotiates a lower wage. The potential imposition of an export tax in the EB country would restrict its firm’s output, with a positive effect on profits due to a price increase. However, the tax revenues would not be sufficiently large to compensate the negative impact on the EB firm’s revenues and profits due to output restriction. Therefore, the country with the EB institution does not intervene.

---

4. As is known, through the analysis of the first four differentials we may obtain any possible Nash equilibrium of the game; they represent the unilateral governments’ gains from deviating from a symmetric equilibrium. On the other hand, the latter two differentials are used to check the Pareto-properties of the symmetric policy regimes.

5. In presence of differentiated goods, the results of our model are robust to the case of substitute goods; on the other hand, with complement goods, the unique equilibrium is \((S, FT)\), that is, the country with the EB institution intervenes while the country with the RTM institution chooses free trade. The intuition behind the latter finding is the following. The imposition of the export tax shrinks the EB firm production, leading both to a rise in the price for the goods and the EB union’s wage demand. Due to strategic complementarity, the RTM union’s negotiated wage increases as well. However, the government’s subsidisation in the RTM country would expand its firm’s production to
Once having identified the endogenous equilibrium, now we study its welfare properties. We can argue that, via side-payments, there is room for both governments to improve the equilibrium outcome. From payoff comparison, the following remark holds.

**Figure 1 - Social Welfare of Countries 1 and 2, Asymmetric Equilibrium vs Intervention (FT,S and S,S)**

**Remark 1.** Since the welfare gain of the country 2 at the equilibrium FT,S with respect to the S,S is larger than the welfare loss of the country 1 at S,S with respect to FT,S (as shown in fig. 1), then under appropriate side-payment both governments may be better off under S,S.

However, by considering the possibility of side payments between countries with governments able to coordinate, one may ask if it is not better for them not to intervene. Therefore, the answer is in the following remark.

such a level that the negative effect of the price reduction on firm’s revenues would overcome the positive effect on costs. As a consequence, the country with the RTM institution does not intervene.
**Remark 2.** The EB country 1 would be better off under free trade than under the asymmetric equilibrium $FT,S$ while the opposite holds true for the RTM country 2 (as displayed in fig. 2). However, given that the social welfare gain of country 1 under $FT,FT$ is larger than the welfare loss of the country 2, then under appropriate side-payment both governments would be better off under free trade.

Therefore, we may conclude that side-payments by one of the parties (RTM country under $S,S$, EB country under $FT,FT$) would improve the welfare of the asymmetric Nash equilibrium ($FT,S$) for both exporting countries. Nonetheless, we have shown that in the presence of different labor market institutions, in contrast to the standard Brander and Spencer’s result, we have a different trade policy equilibrium regime, and the interventionist dominant strategy for the RTM country is also welfare improving. Thus, the Brander and Spencer’s Prisoner’s Dilemma structure of the trade policy game partially vanishes.

---

6 As known (Buccella 2011; Fanti, 2015; Fanti and Buccella, 2016; 2017), in presence of asymmetric bargaining agendas, other options arise for how the timing of the game can be specified. In fact, supposing firm/union pair 1 adopts EB while firm/union pair 2 adopts RTM, besides the timing proposed in the main text, it is also possible: alternative (a) at...
5. CONCLUSIONS

This paper has developed a model of ‘export rivalry’ between two countries for a homogeneous good in a framework in which unionised labour markets are characterised by different institutional bargaining arrangements. We have shown that, in this context, the standard results of the strategic trade policy in which both governments set subsidies for their exporters are no longer valid. In detail, we have shown that 1) the government in the country in which the EB (resp. RTM) arrangement is in place always finds beneficial to set an export tax (resp. an export subsidy), regardless of whether the other government intervenes; 2) an asymmetric equilibrium arises in which only one government (the RTM country) intervenes; 3) provided that appropriate side-payments are allowed, governments would find advantageous to coordinate either over full intervention or free trade, with the latter ensuring higher welfare levels; 4) however, this asymmetric equilibrium is preferred by the RTM country, in the sense that its national social welfare is always higher than under free trade. These results reveal that active trade policies in the RTM country partially solve the classical Brander and Spencer’s Prisoner’s Dilemma structure of the trade policy game.

Of course, another realistic case is when only one firm is unionised while the other one is not unionised. Also in this case the ‘subsidy equilibrium’ might not be the Nash equilibrium of the game between governments, with interesting welfare consequences. Moreover, as future lines of research, we can study how these findings change under differentiated goods and Bertrand competition. Moreover, the present basic third-market model could be extended taking into account 1) the presence of domestic consumers in the producers’ countries; 2) the presence of firms’ managerial (sales) delegation; and 3) the importing country government’s active policy intervention. These cases are left for future research.
REFERENCES


