

# La tarifficazione delle quote a tariffa ridotta in concorrenza oligopolistica

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# TRQs and agricultural trade

- **TRQs are two level tariffs:** in-quota imports are subject to a lower tariff than out-of-quota imports;
- The UR Agreement on Agriculture introduced TRQs to guarantee minimum market access in highly protected markets
- Developed countries use TRQs to grant preferential access to developing countries

## TRQs and agricultural trade

- More than 15% of agricultural products imported by the EU are covered by a TRQ (10% in Japan and US);
- The extensive use of TRQs has raised questions and many countries ask for a liberalisation of TRQs;
- TRQs liberalization: increase in  $Q$ , reduction in  $t$  or  $T$ , or **tariffication**

# Literature

- Most contributions on agricultural TRQs and on their liberalization assume **perfect competition**;
- **But** world agricultural trade is often highly concentrated.
- Empirical evidence on **the degree of competition** in the agricultural trading industry is poor and contradictory, but some papers found evidence of some degree of market power;
- Evidence of **quantity** competition for bananas (Deodhar, Sheldon, 1995) and **price** competition for grains (Patterson and Abbott, 1994; Thursby, Thursby, 1990)

# Theoretical literature

- Literature on quota-tariff equivalence under oligopoly has shown that strategic interactions under quotas and tariffs are different (e.g. Harris, 1985; Krishna, 1989);
- **But** most papers assume exogenously the mode of competition: Cournot or Bertrand or a conjectural variation parameter;
- This means that they implicitly assume that a change in the trade policy (quota  $\rightarrow$  tariff) does not modify the mode of competition, which is a rather unrealistic assumption;
- Further, models predictions are dependent on the *ex-ante* assumption about the mode of competition;

## The aims of this paper

1. To consider the presence of large **oligopolistic traders** in modelling TRQs and their tariffication;
2. To develop an oligopoly (capacity constrained) model in which the **mode of competition** is **endogenous** (Kreps, Scheinkman, 1983; Maggi 1996);

## The model

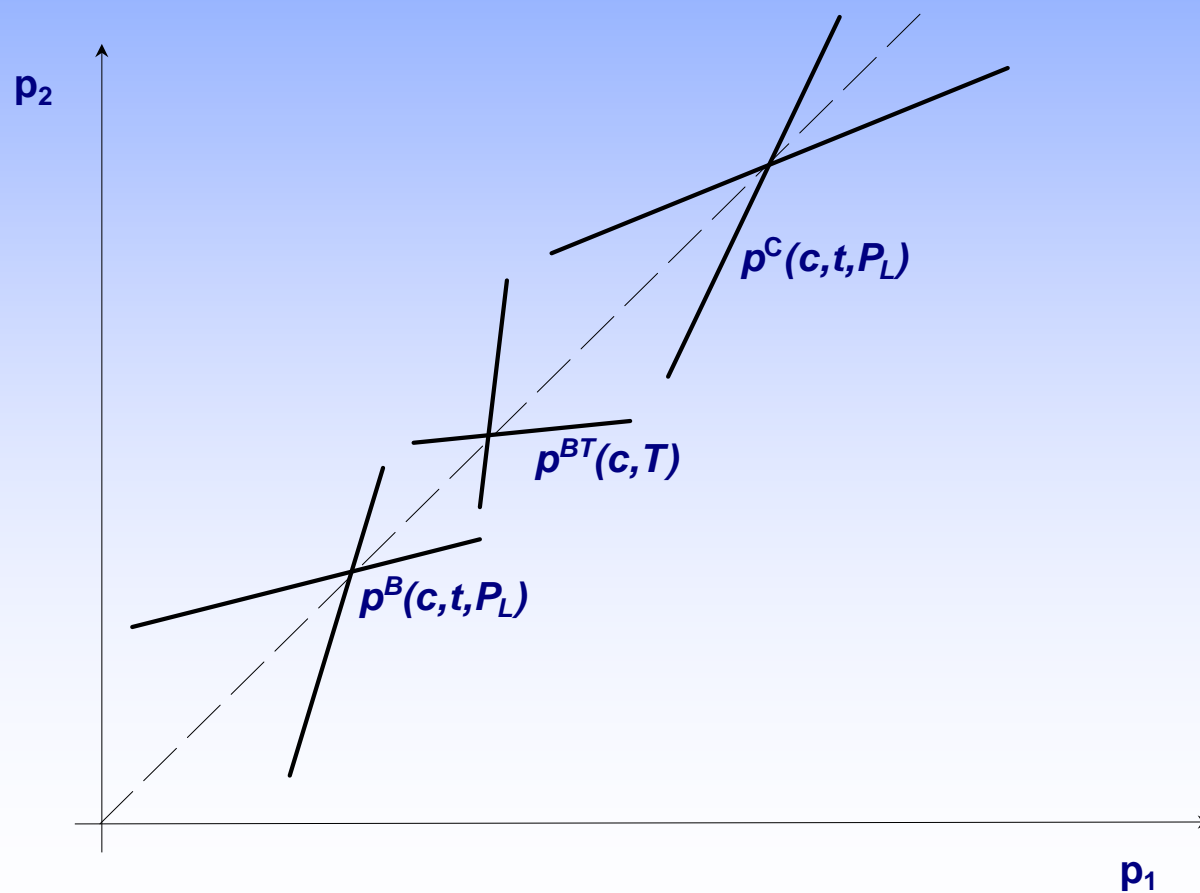
- Two **symmetric** trading firms importing a **differentiated** product in one country
- Linear demands and constant marginal trading costs,  $c$ ;
- $Q$  is the import quota and  $t$  and  $T$  are the in-quota and the out-of-quota tariffs.
- Quota licences are allocated on **an historical basis** and **licences are transferable**;
- Each duopolist holds  $q_i^0$  licences.

- **Market for licences:** small operators hold licences and supply licences to oligopsonistic large firms at price  $P_L = e + f(q_1^d + q_2^d)$
- **First stage:** firms choose capacity, i.e. the amount of purchased licences; by this way they commit themselves to import a certain quantity in the second period.
- **Second stage:** firms compete on price. They can increase imports, but only out-of-quota;



# Three possible sub-game perfect equilibria

(Maggi, 1996):



## The mode of competition depends upon the effectiveness of the capacity commitment:

A. If the cost of adjusting capacities in the two stages is identical ( $T = P_L + t$ ) then the commitment is not effective and the equilibrium the outcome of one-shot Bertrand game with long run costs equal to  $c + t + P_L$

- B. If the cost of adjusting capacities in the second period is very high ( $T > T^*$ ), then **the commitment is effective** and the outcome is the one-shot **Cournot** game with long run costs equal to  $c + t + P_L$
- C. If the cost in the second period is greater than in the first period, but is lower than critical value ( $P_L + t < T < T^*$ ) then the equilibrium is **between Bertrand and Cournot**

# Tariffication

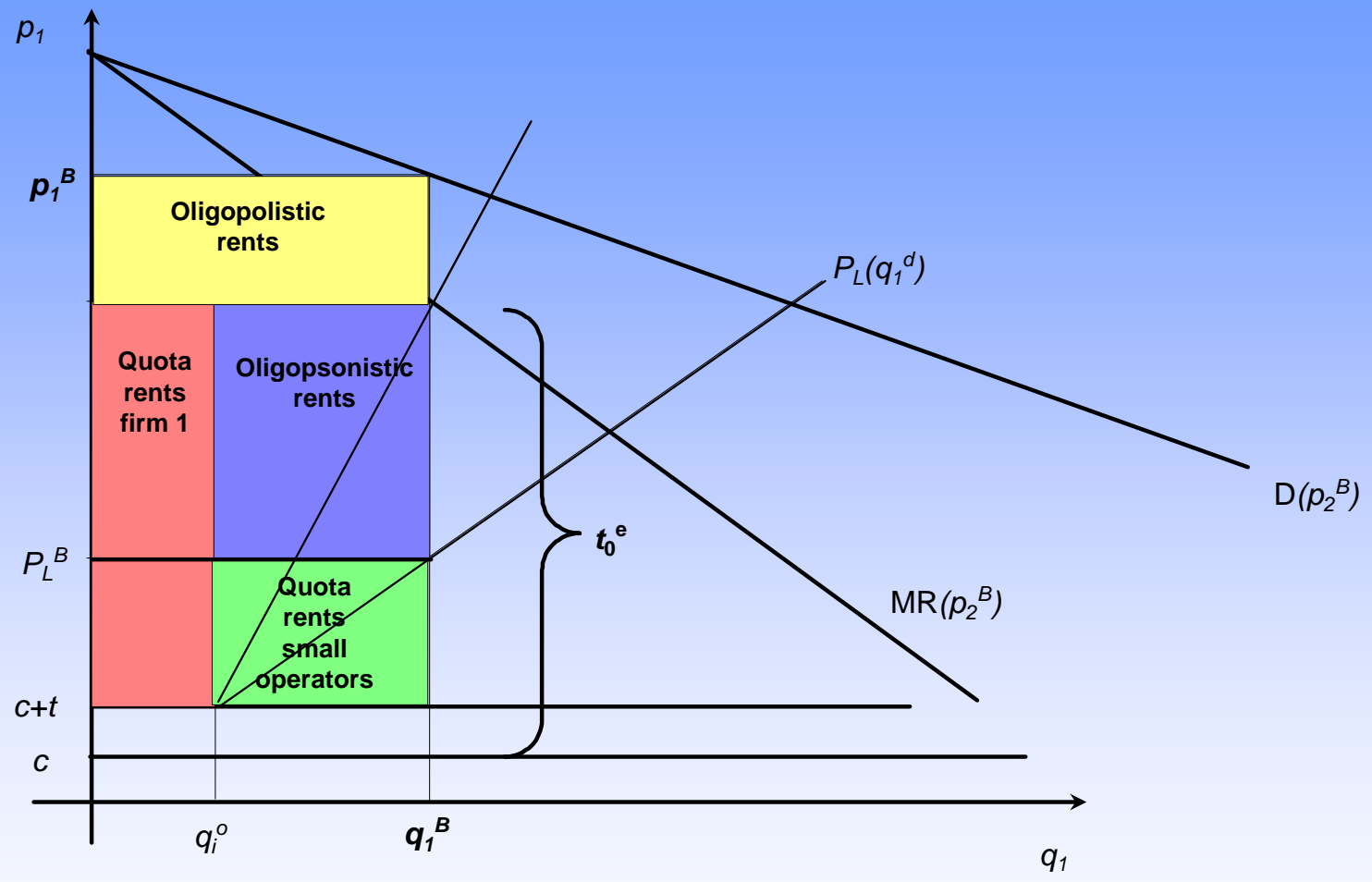
- With a tariff, there is no capacity constraint and the solution of the game is Bertrand;
- Therefore, the tariff which leaves unchanged imports varies according to **the mode of competition under the TRQ**

## Case A: Under the TRQ the equilibrium is Bertrand (the capacity commitment is not effective)

- Tariffication does not change the mode of competition;
- The *tariff which leaves unchanged imports* is the tariff satisfying  $q_i^B = q_i^{Bt_0}$  :

$$t_0^e = \frac{ab_2f - (2b_1^2 - b_1b_2)(t + e + cf) + b_1b_2cf}{(f - 1)(2b_1^2 - b_1b_2) - b_1b_2f}$$

- This is the tariff that leaves unchanged the price as well
- This tariff includes  $t$ ,  $P_L$  and oligopsonistic rents



**Case B:** Under the TRQ the equilibrium is Cournot (the capacity commitment is effective):

- Tariffication shifts the mode of competition from Cournot to Bertrand;
- The *tariff which leaves unchanged imports* is  $T^*$  which satisfies  $q_i^C = q_i^{Bt_0}$  which implies

$$p_i^C(c, t, P_L) = p_i^{Bt_0}(c, t_0^e)$$

- This tariff includes  $t$ ,  $P_L$ , oligopsonistic rents, and **part of oligopolistic rents**

## Case C: Under the TRQ the equilibrium is in between Bertrand and Cournot

- The *tariff which leaves unchanged imports* is in this case the *out-of-quota tariff  $T$* ;
- This tariff includes  $t$ ,  $PL$ , oligopsonistic rents, and part of oligopolistic rents
- It is higher than in case a) but lower than in case b);



## Main findings of the model are:

- The TRQ tariff equivalent changes according to the relative values of  $t$ ,  $T$  and  $P_L$  (which depends upon the allocation of licences)
- If  $T$  is sufficiently high, the capacity commitment is effective, the degree of competition under the TRQ is low and the tariff equivalent is high, even if out-of-quota imports are zero;
- The higher the concentration of licences in the hands of large traders, the lower the degree of competition, the higher the tariff equivalent

# Conclusions

- The theoretical model includes **more realistic assumptions** about the structure and conduct of international agricultural markets and the working of TRQs by considering:
  - Oligopolistic traders;
  - The allocation of licences and a market of licences;
  - That the mode of competition is affected by the trade policy

- The theoretical model suggests an approach alternative to the conjectural variation approach to **assess the mode of competition** based on few observable parameters, i.e.  $t$ ,  $T$ ,  $P_L$ ;
- The model has shown how oligopolistic models with endogenous mode of competition may provide rather different results: by ignoring **oligopolistic rents** and **endogenous mode of competition** the **tariff equivalent can be underestimated**

**Grazie!**