Part II

Large Country Case and Non-Tariff Instruments

- **3.2 The Large Country Case**

- Assumption: the trade policy now impacts on the world market prices

- Intuitions
  - suppose a country sets a tariff on good X
  - tariff ⇒ increase in local market price ⇒ increase in good X production, decrease in good Y production (relative to free trade)
  - in a large country the shift in demand from good X to good Y is enough to cause an increase of the price of good Y relative to the price of good X:

    p^* decreases

  ⇒ the relative price of exports increases: 'terms of trade improvement'

  ⇒ new incentives to set a tariff in the large case country

- For any p^*, the perceived price is

$$\Rightarrow p = (1+t)p^* > p^*$$

$$\Rightarrow X^d(p) < X^d(p^*)$$

$$X^s(p) > X^s(p^*)$$

uniform shift of the excess demand function: as long as the good is exported

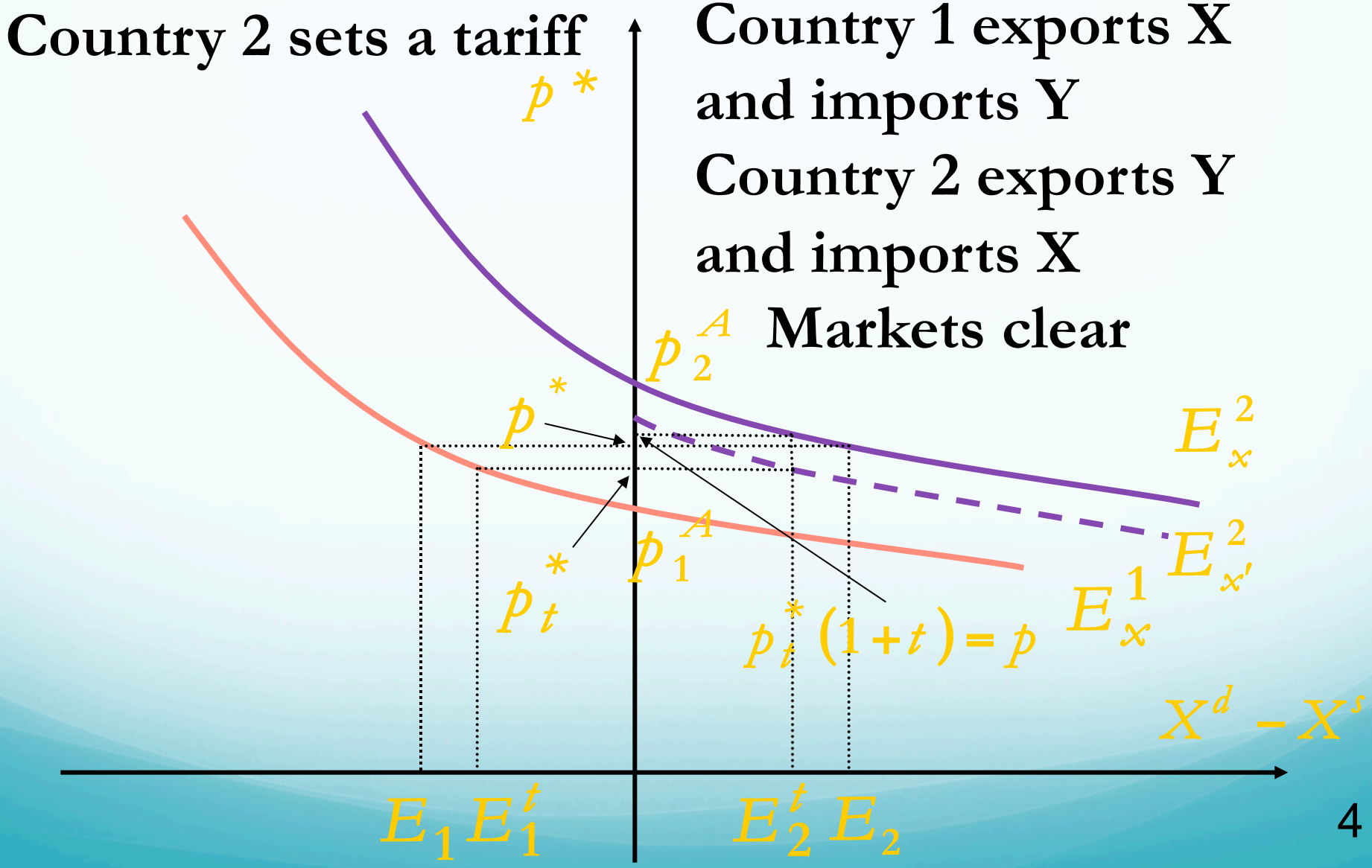
$\Rightarrow$

E_x^h is replaced by $E_{x'}^h$

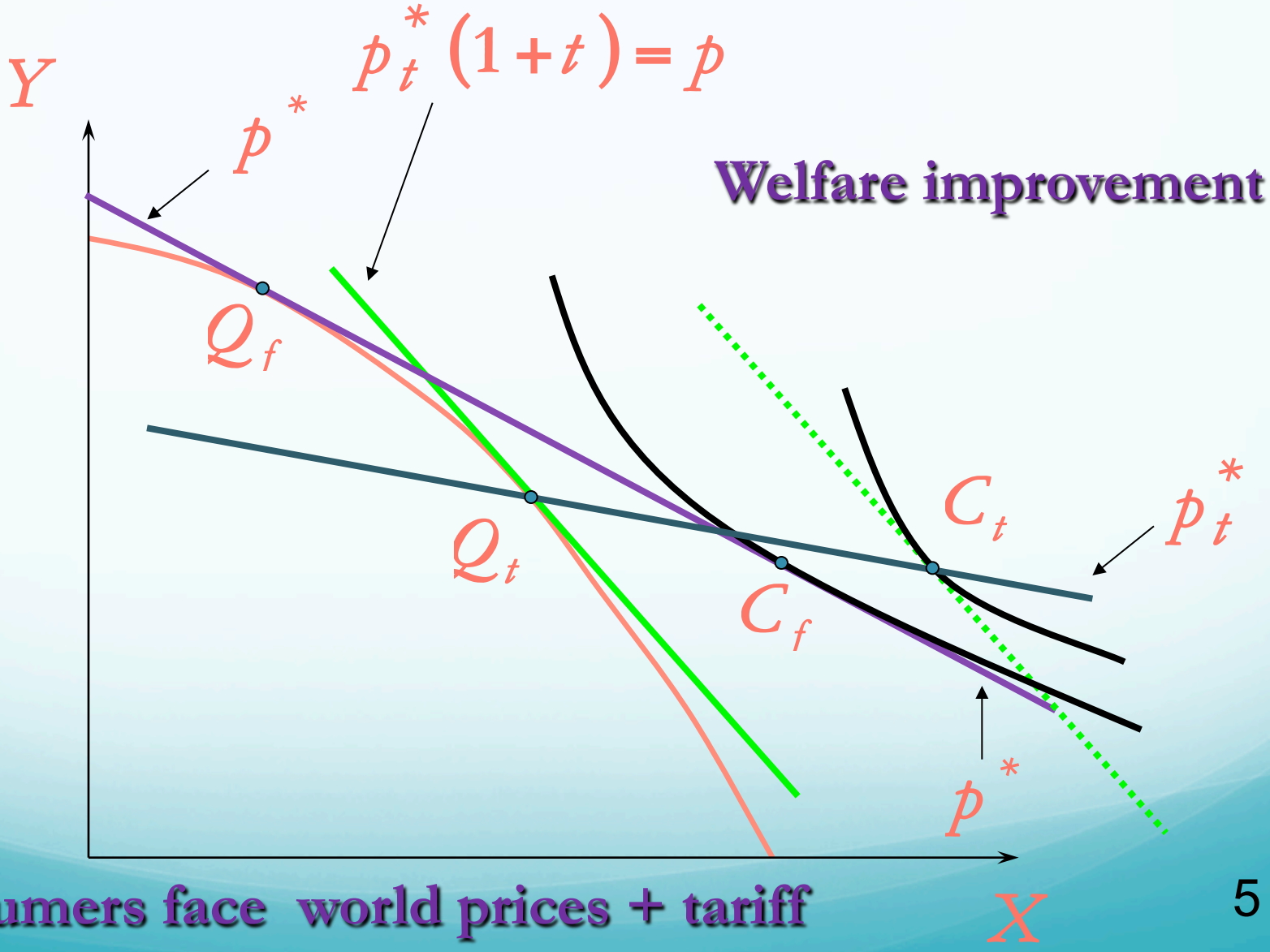
$\Rightarrow$ the new world price is lower than the world price under free trade: $p_t^* < p_f^*$

- Impact of a tariff on the world price viewed on excess demands: see next figure

- Figure: Excess Demands Under Tariff



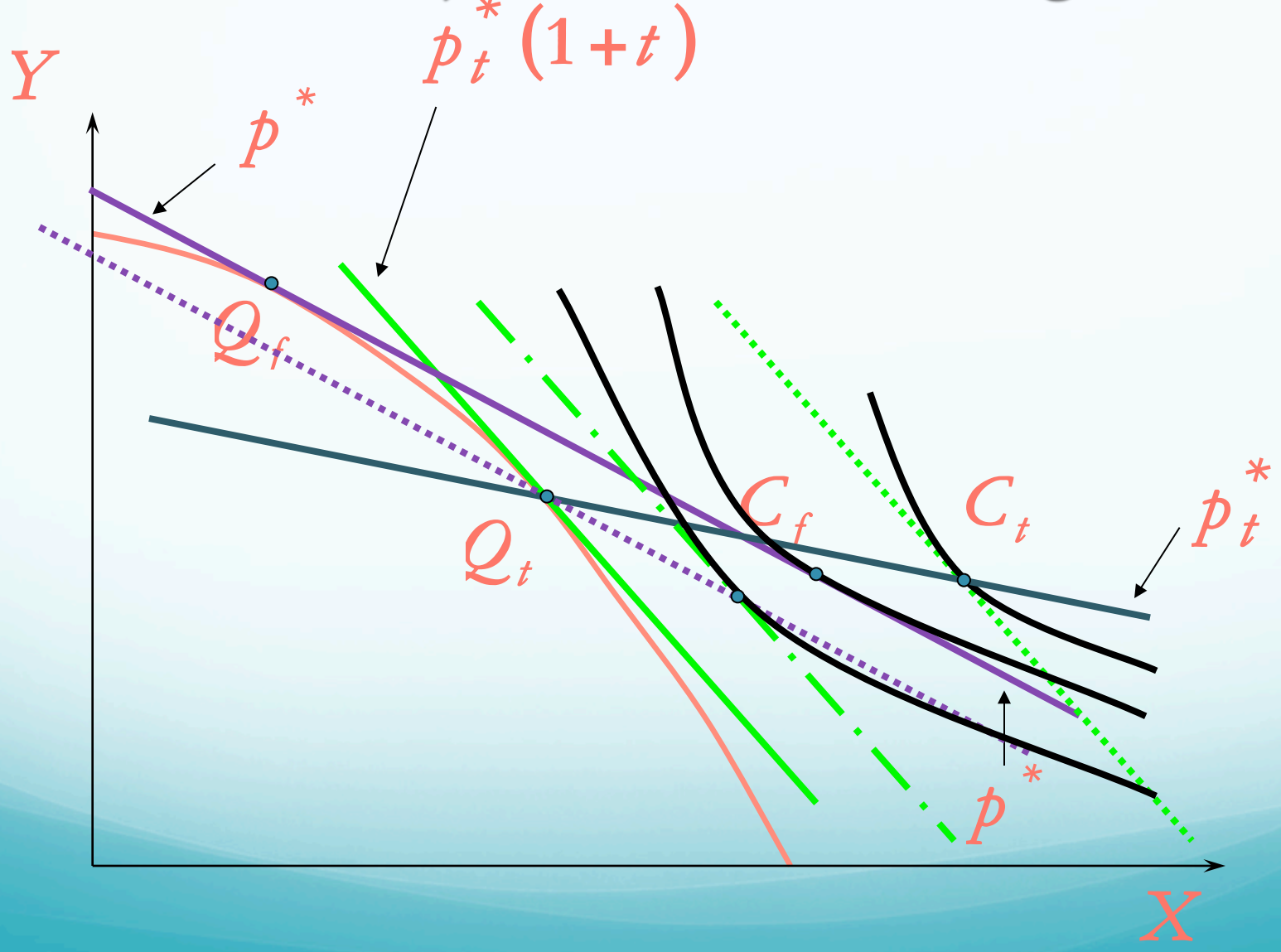
Large country: t ⇒ improvement of the terms of trade
And **trade balance equilibrium at world prices**



Consumers face world prices + tariff

Welfare effects : 1) "if terms of trade didn't change": loss

2) terms of trade effect: gain



- Intuitions
  - under autarky, monopoly power is bad for welfare: producer gains are smaller than consumer losses
  - under free trade: large gain for exporters if exports are large, smaller consumer losses since some consumers are foreign
  - perfect competition ⇒ no monopoly power for the firms
  - but the government can induce competitive firms to act as monopolists on the foreign market, by restricting trade
  - the deadweight loss is more than offset by the export income

- Optimal tariff theorem
  - it can be shown that an optimal positive import tariff always exists if it set unilaterally by a single country (no trade policy set by the other countries)

- Intuitions:
  - the optimal tariff is larger, the smaller the demand elasticity and the larger the country size

    if perfectly elastic demand ⇒ no price variation ⇒ small country case
  - it also depends on the supply elasticities and of the other country's size

- Welfare decreases in the other country (compared to free trade):
  - two effects:
    - ✓ less trade ⇒ less specialization and exchange gains
    - ✓ terms of trade deterioration: the exported good price decreases for this country
- Asymmetries between countries may also be larger, because no tariff income in the no policy country

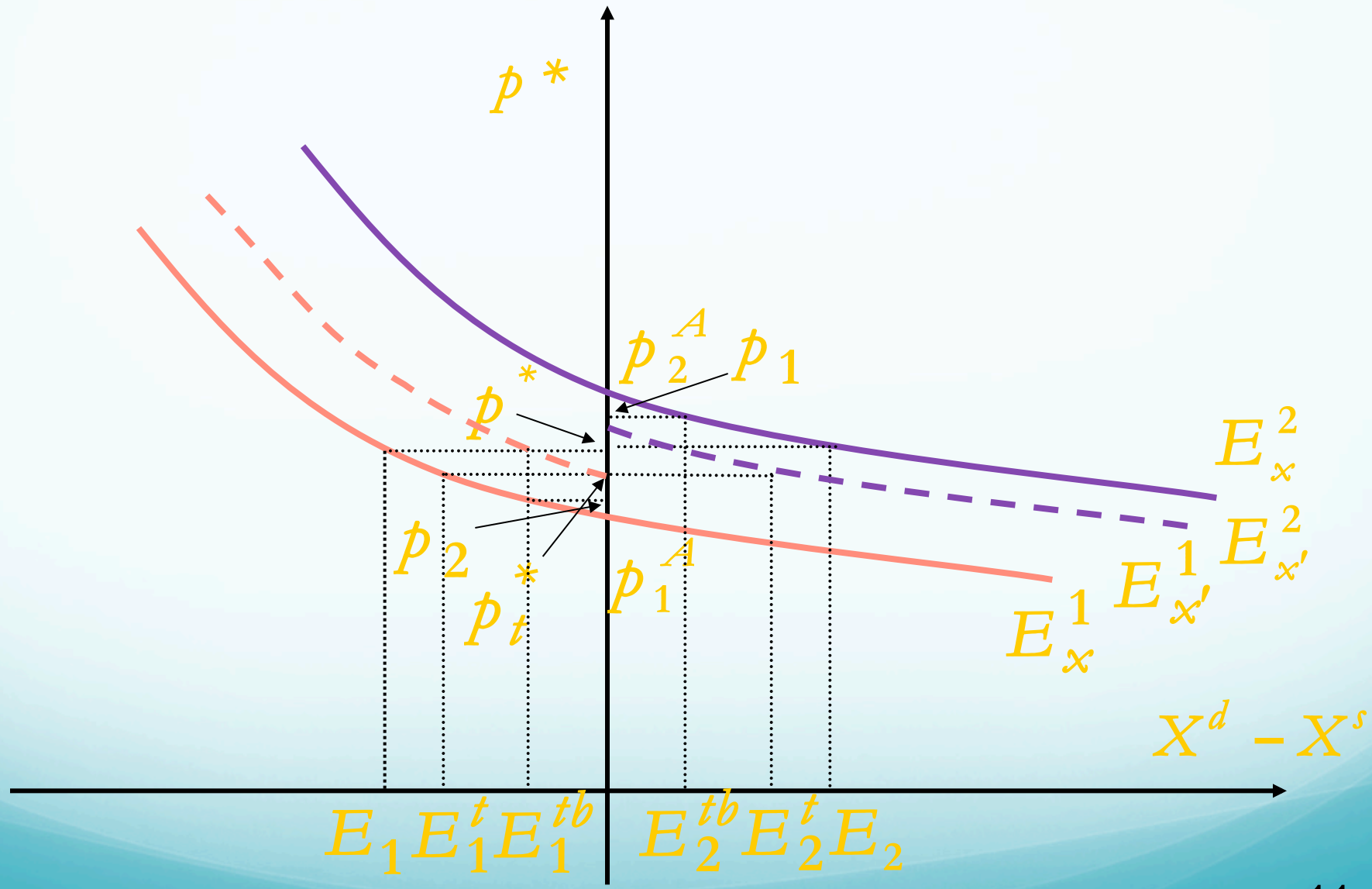
- Tariff war between two large countries
  - the optimal tariff always exists when it is unilateral only
  - if two large countries:

✓ the price decrease caused by each importing country's tariff increases excess demand in the exporting country

✓ the two effects offset!

✓for example when country 1 retaliates by setting a tariff on good Y, good X exports decrease, which implies an increase in the world price

Figure: Excess demands with reciprocal tariffs



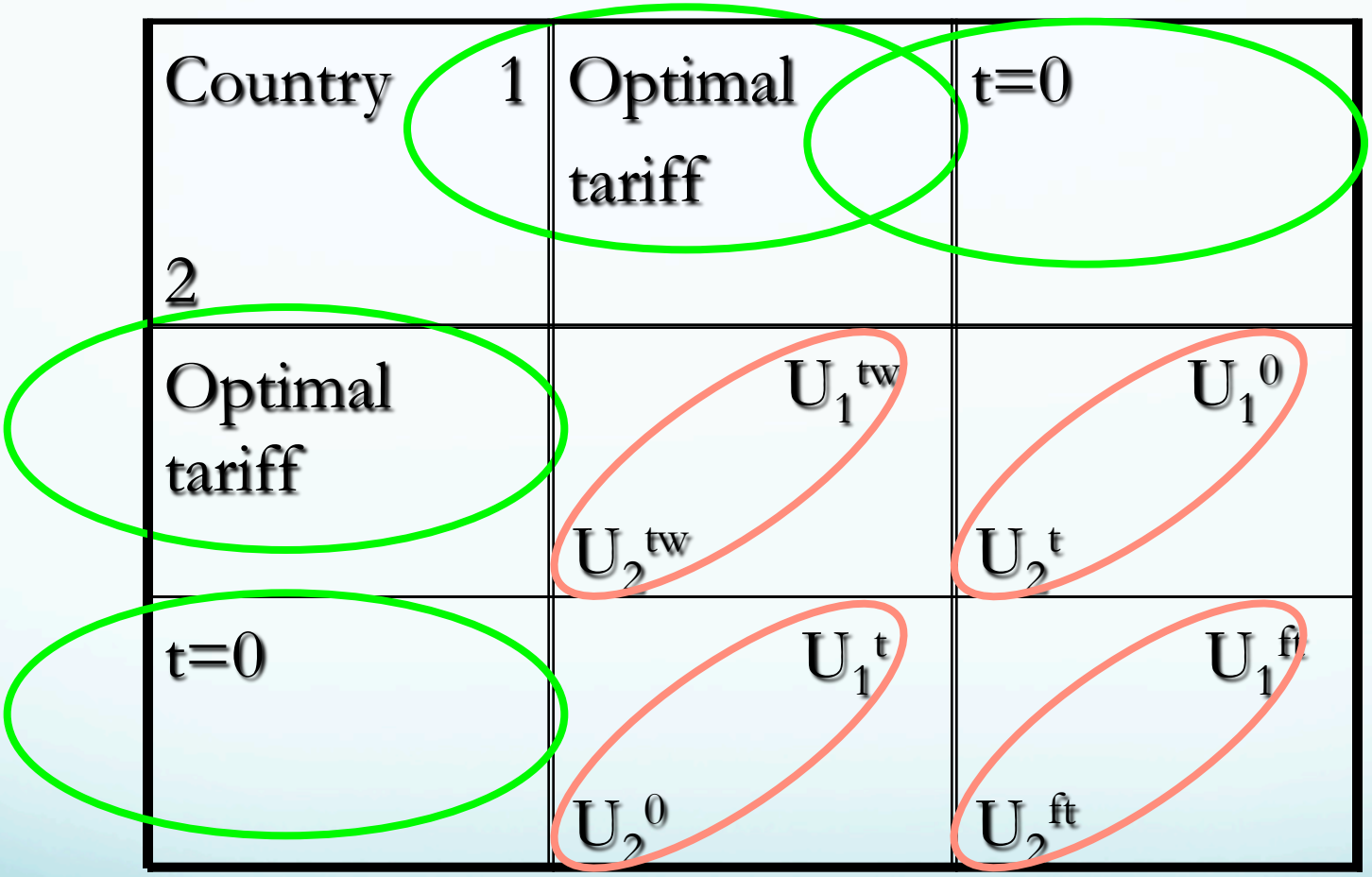
⇒ only the small country effects remain

⇒ welfare loss in both countries, compared to free trade

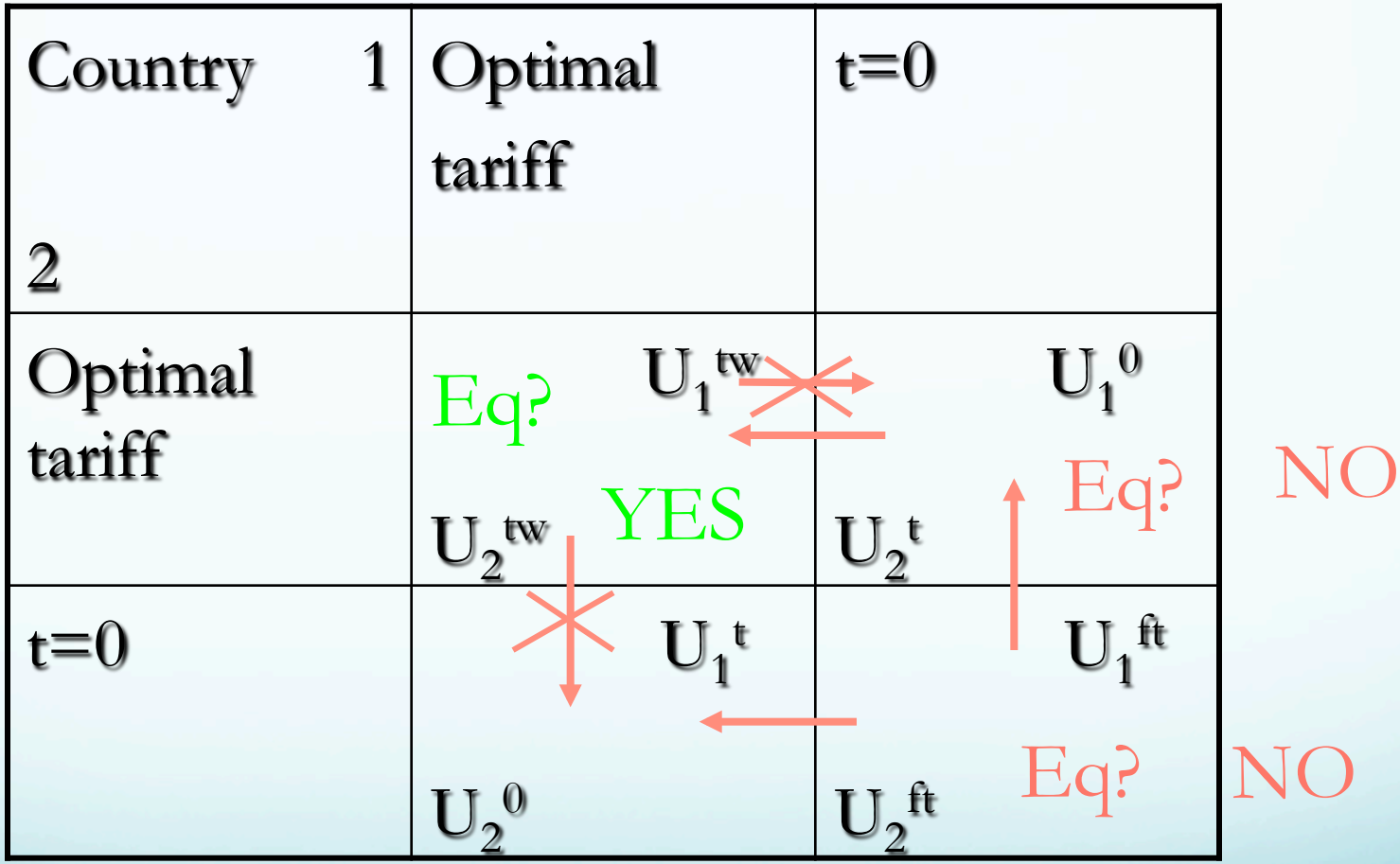
(if same size, demand elasticity and tariff)

⇒ prisoner's dilemma (see Introduction): a unilateral tariff increases welfare compared to free trade, but bilateral tariffs reduce welfare: see next slide

⇒ reciprocity in multilateral trade liberalization is Pareto-optimal: equal concessions imply the same world price can be achieved with a lower deadweight loss

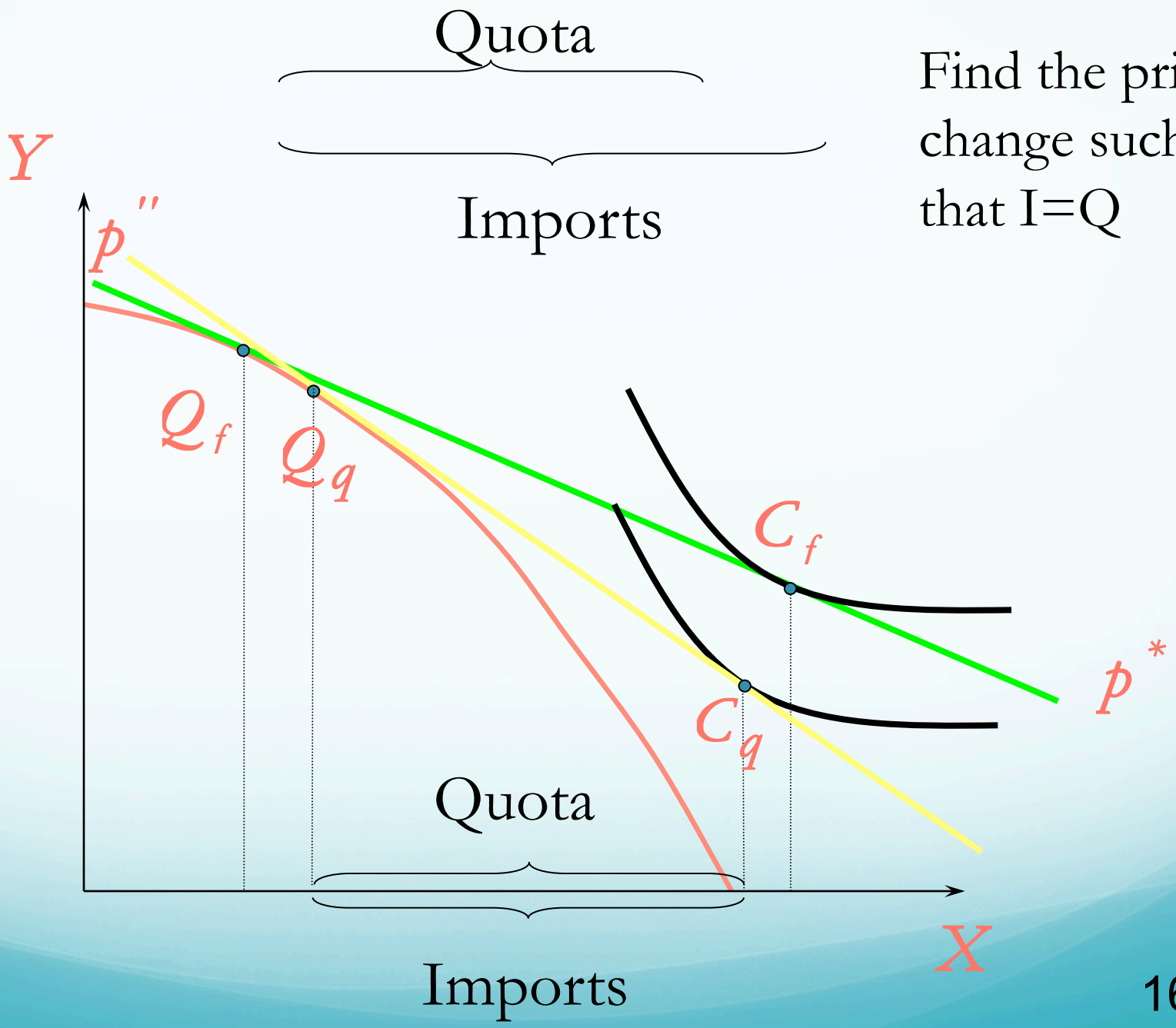


$$U_i^0 < U_i^{tw} < U_i^{ft} < U_i^t$$



$U_i^0 < U_i^{tw} < U_i^{ft} < U_i^t$

- **4. Non-Tariff Barriers: Quotas and Voluntary Export Restraints**
- **4.1 Quotas**
- Quota definition: imports are limited to a given quantity (during a certain period)
- Intuitions: the imported good is scarce, thus its price increases on the internal market
- reverse intuition compared to a tariff (the imported good price increases, thus the consumption decreases) but same effect on the equilibrium
- next figures: small country case



Find the price change such that I=Q

- Q_f, C_f: open economy without quota
- Q_q, C_q, production, , consumption constructed such that imports are equal to the quota

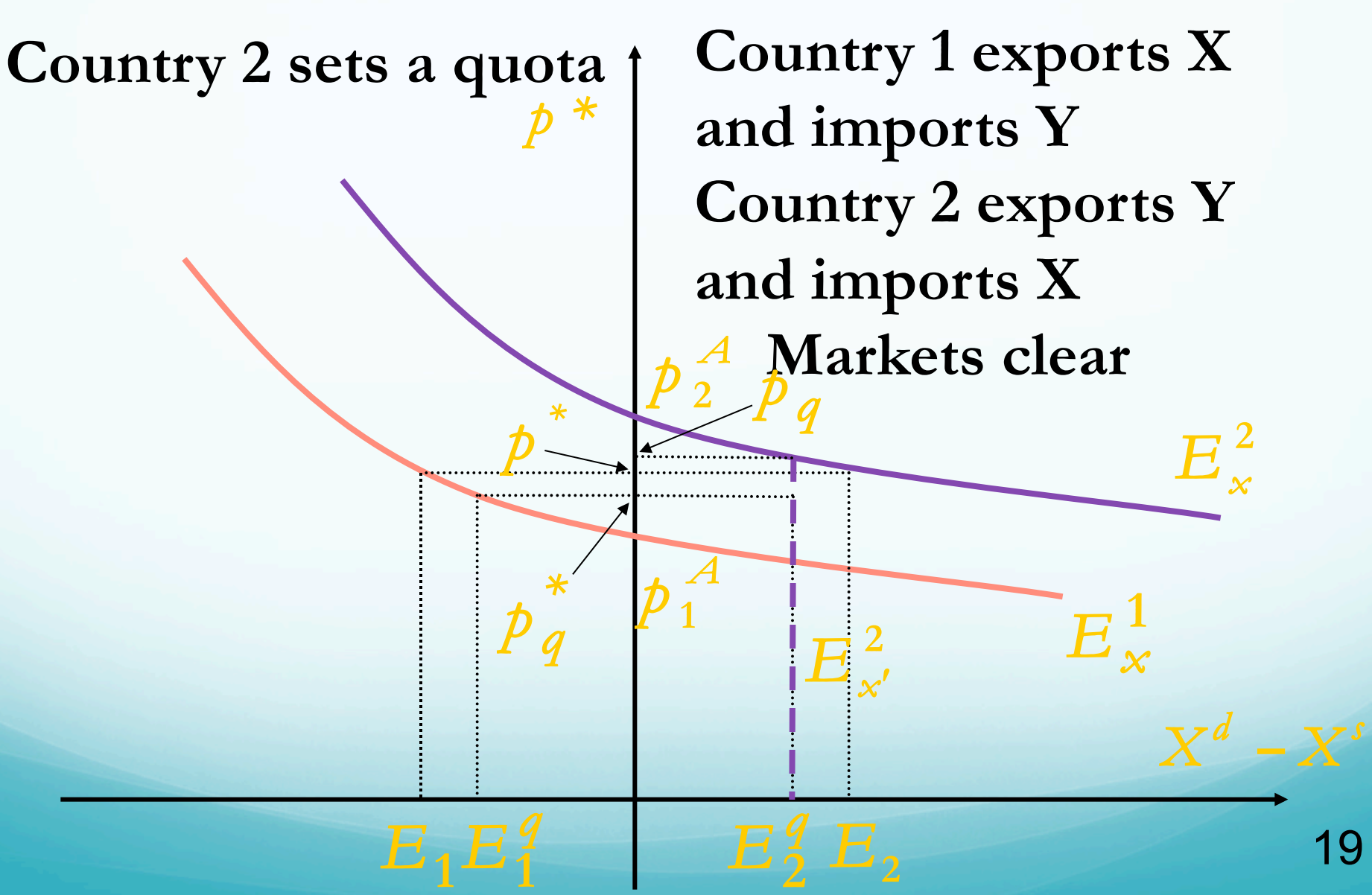
  (start from Q_f and progressively increase the price till imports are equal to the quota)
- from this, the internal price, p_q, can be derived:

  the production frontier and the utility are tangent to the internal price, p_q, the budget constraint passes by Q_q and its slope is p_q
- more difficult construction, but same kind of equilibrium as in the tariff case : notice however that the budget constraint is drawn with a slope equal to p_q and not p^*, which is discussed below

- Large country case
  - Graphic representation of the excess demand functions under quota in the large country case:

    vertical part for any imported quantity that would be larger than the quota

- Figure: Excess Demands Under Quota



⇒ the quota reduces the supply of good X on the local market ⇒ the local relative price increases ⇒ local firms have incentives to produce relatively more good X

⇒ a relatively lower supply of good Y on the world markets decreases the world relative price

⇒ terms of trade effect benefiting to the country that sets the quota: the world price decreases (⇒ the imported good price decreases, while the exported good one increases)

⇒ optimal unilateral quota in the large country case

- Tariff / quota equivalence
  - quota rent: difference between the local price and the world price of good X times the quota (= imports)
  - a quota is equivalent to a tariff if the quota rent goes to the local consumers:
    - ✓ budget constraint under tariff:

$$p_X^*(1+t_q)X^d + p_Y^* Y^d =$$

$$p_X^*(1+t_q)X^s + p_Y^* Y^s + t_q p_X^*(X^d - X^s)$$

$$\Leftrightarrow \quad p_X^* X^d + p_Y^* Y^d = p_X^* X^s + p_Y^* Y^s$$

- ✓ budget constraint under quota:

$$p_X^q X^d + p_Y^* Y^d = p_X^q X^s + p_Y^* Y^s + R$$

⇒ the constraints are equivalent if and only if

$$R = \left(p_X^q - p_X^*\right)\left(X^d - X^s\right) = t_q p_X^*\left(X^d - X^s\right)$$

⇒ equivalent tariff: $t_q p^* = p_q - p^* \Leftrightarrow t_q = \frac{p_q}{p^*} - 1$

⇒ a quota is equivalent to a tariff if the government captures the rent:

- ✓ auctioning import licenses at a unit price equal to the quota rent per unit
- ✓ if the government cannot capture the rent, a quota is less efficient than a tariff (compare previous figure with figure with tariff), which is the general case (auction costs, rent seeking behavior)

- Quota war
  - if both countries set a quota, same story as if they both set a tariff, or a quota and a tariff: the two terms of trade effects offset ⇒ welfare loss

- Other non-tariff barrier: Voluntary Export Restraints (VER)

  ⇔ a limited quantity can be exported

  ⇔ export tax ⇔ tariff

  - no problem to recover the benefit from the VER, since local producers

- good X exporting country example
  - ✓ budget constraint

$$p_X^{VER} X^d + p_Y^* Y^d = p_X^{VER} X^d + p_X^* \left(X^s - X^d \right) + p_Y^* Y^s$$

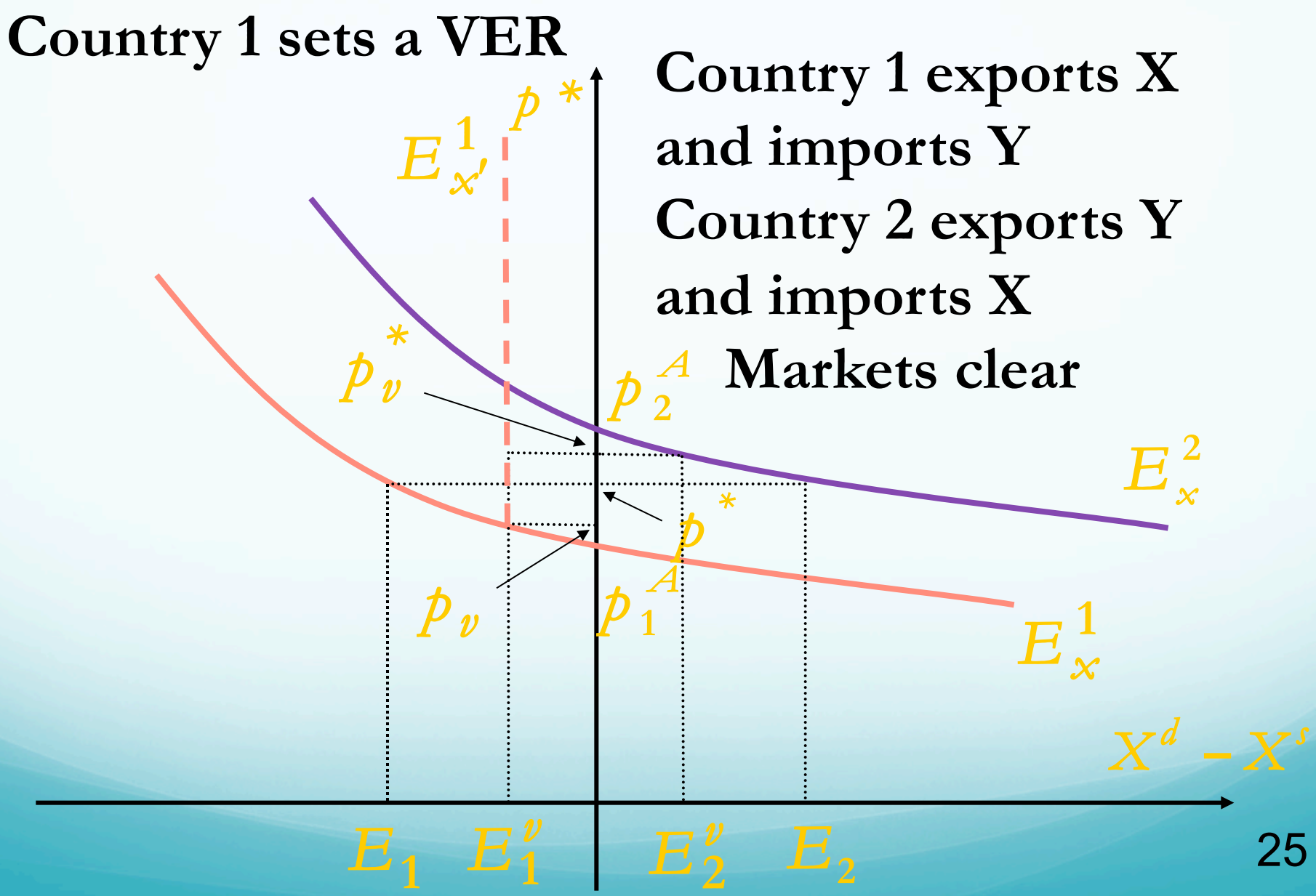
$$\Leftrightarrow \quad p_X^* X^d + p_Y^* Y^d = p_X^* X^s + p_Y^* Y^s$$

⇒ some exporters are"lucky", but their export rent is necessarily captured in the country

- see next figure for an illustration of the effect on the world price of a VER set by country 1 on good X

⇒ similar stories as for quotas can be told, apart the rent capture problem

- Figure: Excess Demands Under VER



- **Other causes of non-equivalence of quantity barriers and tariff**
  - **country growth**
  - **price fluctuation**

  ✓ **a tariff implies an automatic adjustment of prices, and thus of quantities in both cases, whereas quota and VERs do not**
  - **if countries are growing, both would like to trade more, but this is not possible under unchanged quotas. Under a tariff, trade grows without any change in trade policy.**

- **References**

Markusen, J., J. Melvin, W. Kaempfer, and K. Maskus, 1995. *International Trade - Theory and Evidence*, **Mc Graw-Hill. Chapters 15 and 16.**