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Assessing the Impact of Recent Trade Policy Changes in the Banana Market under Alternative Market Structures

Giovanni Anania
(University of Calabria, Italy)
Margherita Scoppola
(University of Macerata, Italy)

banana trade is highly concentrated

in the ’80s and ’90s three firms (Dole, Chiquita and Del Monte) accounted for 60-65% of the world market; Noboa and Fyffes accounted for an additional 28% **(Arias et al., 2003)**

more recent estimates give the top three firms’ market share at 51%, with Noboa and Fyffes accounting for an additional 10% and few Russian newcomer firms for an additional 10% **(Bananalink, 2009)**

Dole, Chiquita and Del Monte alone account for 90% of US imports **(Arias et al., 2003; EC, 2008)**

the issue

- **a high degree of concentration, vertical integration, few entries and virtually no exit are all signals of the potential exercise of market power in the banana market**
- **however, the (very few) empirical studies which attempted to estimate the degree of market power in bananas trade do not provide robust evidence of the exercise of market power (Deodhar and Sheldon, 1995 and 1996; Herrman and Sexton, 2001; Hatirli et al., 2003)**

- **this helps explain why most attempts to assess the effects of policy changes in the banana market assume perfect competition (Anania, 2006, 2008 and 2010; Guyomard *et al*., 1999a and 1999b; Kersten, 1995; Spreen *et al*., 2004; Vanzetti *et al*., 2005)**

- **…with few notable exceptions (McCorriston and Sheldon, 1996; McCorriston, 2000; and Scoppola, 2008)**

the issue

- **evidence of non competitive behaviors has been documented by the European Commission, which found four traders (Chiquita, Dole, Weichert and Del Monte) guilty of coordinating in 2000-2002 their weekly decisions about selling prices of bananas, and fined them**

  in addition, "*strong indications*" emerged that collusive behaviors occurred before 2000 and after 2002 (EC, 2008a)

the aim of the paper

- **assess how simulation results of the expected impact of recent trade policy changes differ under different assumptions regarding the structure of the banana market**
- **alternative market structure scenarios:**
  - **perfect competition**
  - **international traders colluding by forming a cartel to maximize joint profits**
  - **international traders exerting oligopolistic/oligopsonistic market power, their pricing being based on a mark-up**


the policy issue: the EPAs

- **on 1 January 2008 the EU implemented the (full and "interim") Economic Partnership Agreements it negotiated with many ACP countries**
- **bananas from ACP countries now enter the EU quota- and duty-free**
- **bananas, rice and sugar have been indicated as the three single agricultural commodities where most of the export benefits for ACP countries from the EPAs are to be gained**

the policy issue: the 15 December 2009 agreement

- **EU MFN tariff is to be progressively reduced by 2019 (if no DDA agreement is reached) from 176 to 114 €/t**

- **EU vs MFN exporters and US WTO banana disputes settled (the end of the "banana war")**

- **provides a quantitative assessment, *under alternative market structures*, of**

  (a) the expected benefits from EPA for ACP banana exporters, as a result of ACP exports now entering the EU quota- and duty-free, and of

  (b) the reduction of these benefits because of the erosion of preferential margins due to the lower MFN tariff as a result of the December 2009 WTO agreement

the model

- a revised and updated version of the model used in Anania (2010)
- mathematical programming model
- partial equilibrium
- spatial
- one commodity only
- banana as a homogeneous product
- based on country/region import demand/export supply, or domestic demand/supply functions


the model

- linear functions (at least in the relevant intervals)
- time reference for base model: 2007
- explicit modeling of domestic and trade policies
- 4 importers: EU15, EU12, USA, Rest of the world
- 5 EU producing areas: France (Martinique and Guadeloupe), Spain (Canary Islands), Portugal (Azores and Madeira), Greece and Cyprus

- **14 exporters: Ivory Coast, Cameroon, Dominican Republic, Belize and Suriname, Other ACP non-LDC, Ecuador, Colombia, Costa Rica, Panama, Honduras, Brazil, Guatemala, Other MFN non-LDC, LDC**

the three market structures considered

- **perfect competition (max QWF; Samuleson, 1952)**

  in equilibrium:

  $$[P_j - (P_i + tc_{ij} + t_{ij})] X_{ij} = 0$$

- **oligopolistic/oligopsonistic firms: mark-up**
  (max QWF; Samuleson, 1952)

  in equilibrium:

  $$[P_j - (P_i + tc_{ij} + t_{ij} + markup_{ij})] X_{ij} = 0$$

  $$markup_{ij} = \alpha (P_i + tc_{ij})$$

  $$[P_j - t_{ij} - (P_i + tc_{ij}) (1 + \alpha)] X_{ij} = 0$$

the market structures considered

- **firms collude: maximize joint monopolistic/monopsonistic profits**

$$\text{Max } \prod(X_{ij}) = \sum_{ij} [P_j - (P_i + tc_{ij} + t_{ij})] X_{ij}$$

in equilibrium:

$$[P_j - (P_i + tc_{ij} + t_{ij} + \pi_{ij})] X_{ij} = 0$$

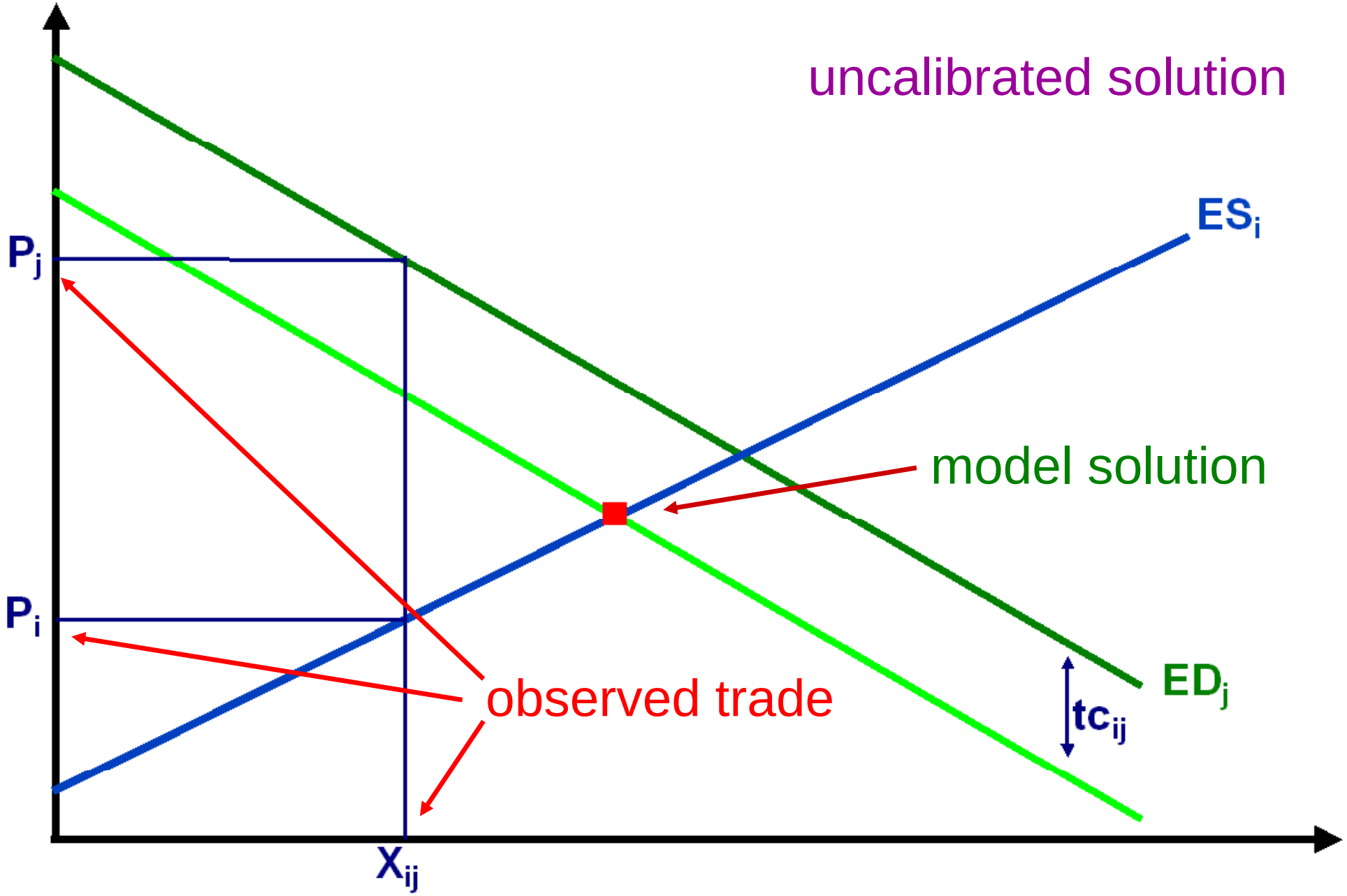
- **market structure is not affected by policy changes**

- **calibration (Paris, Drogué and Anania, 2010):**

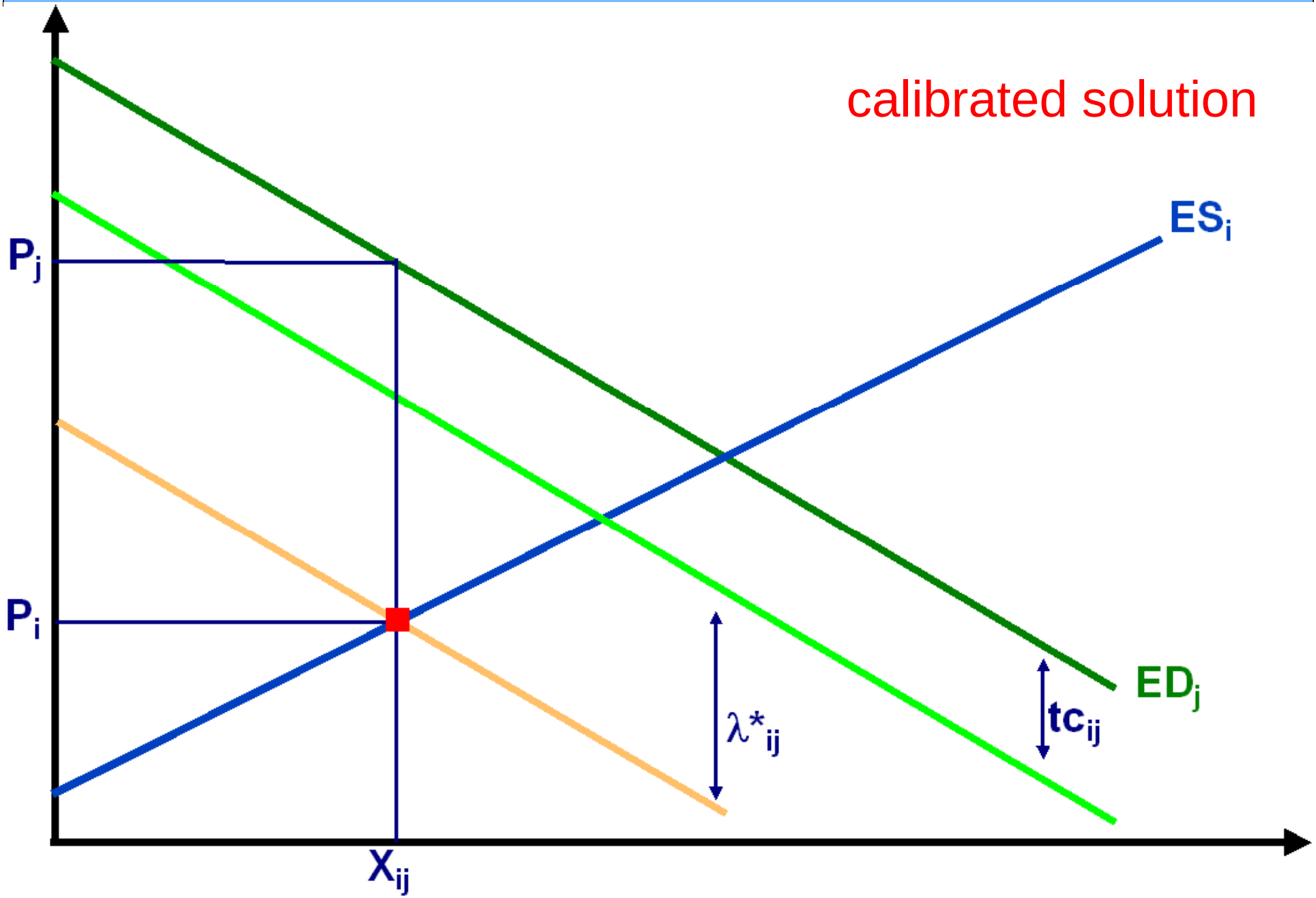
  bilateral transaction costs (tc_{ij}) are corrected, using a PMP-like procedure, to make the base model (2007) generate a solution which replicates observed trade flows

  calibration is different under the different market structures considered

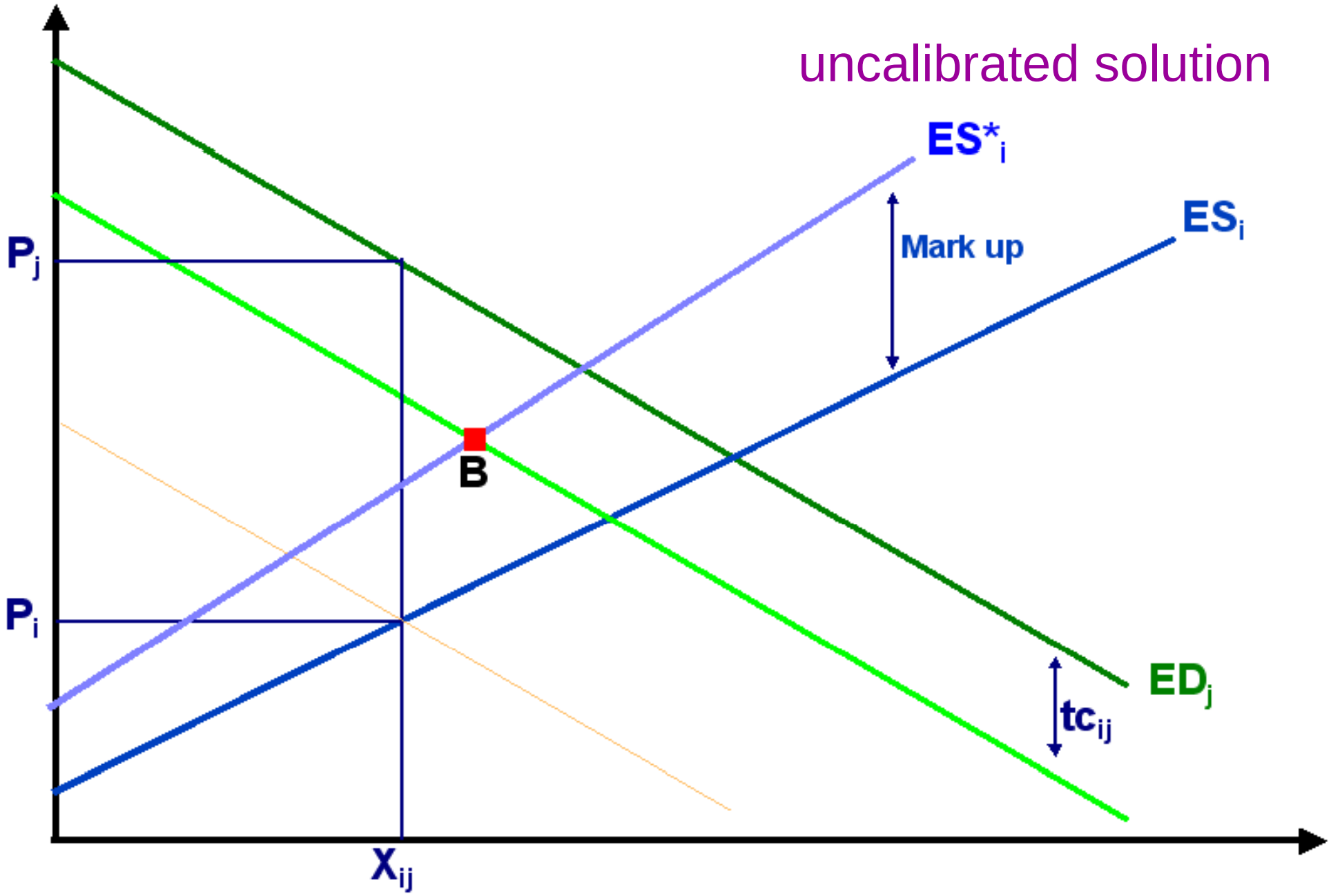
the calibration, perfect competition



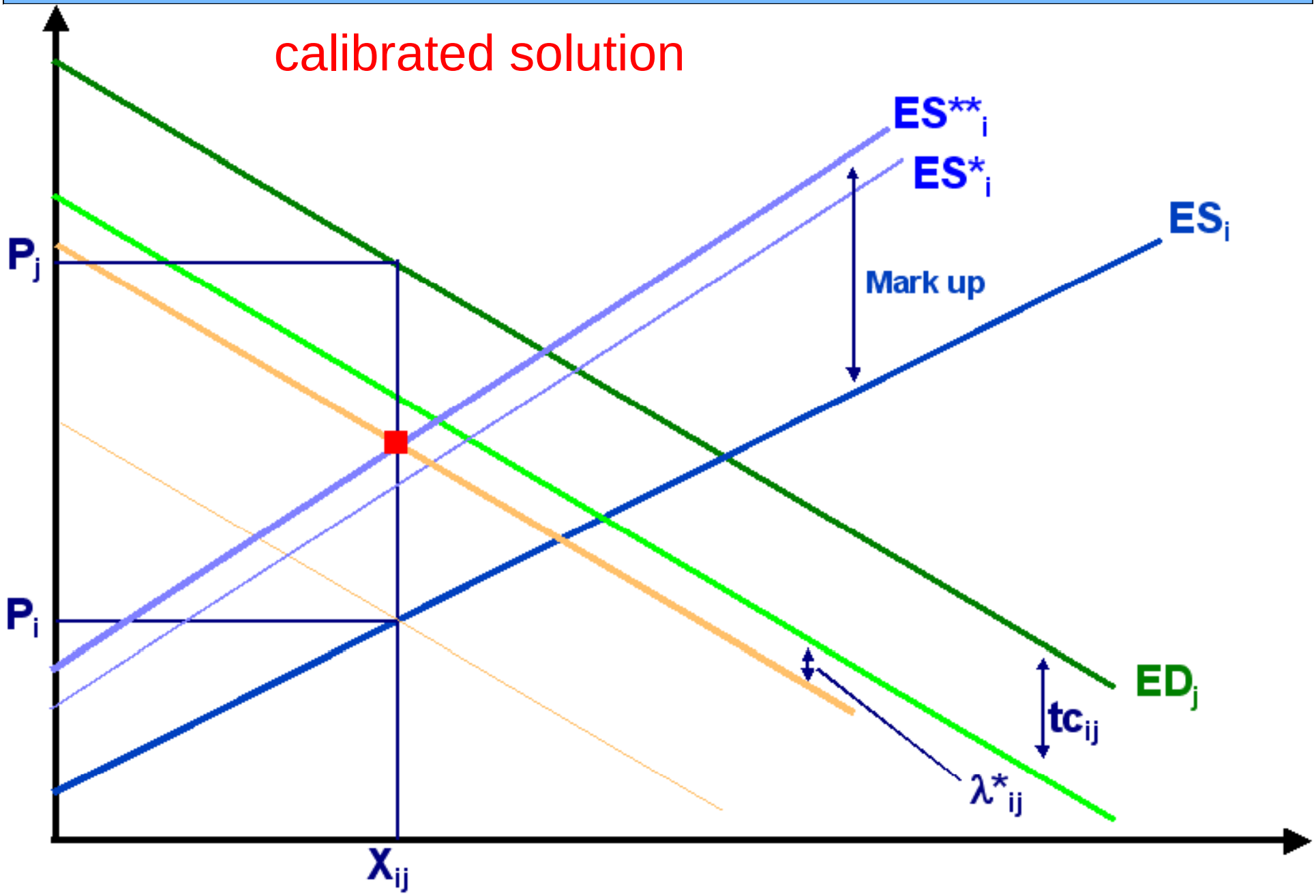
the calibration, perfect competition



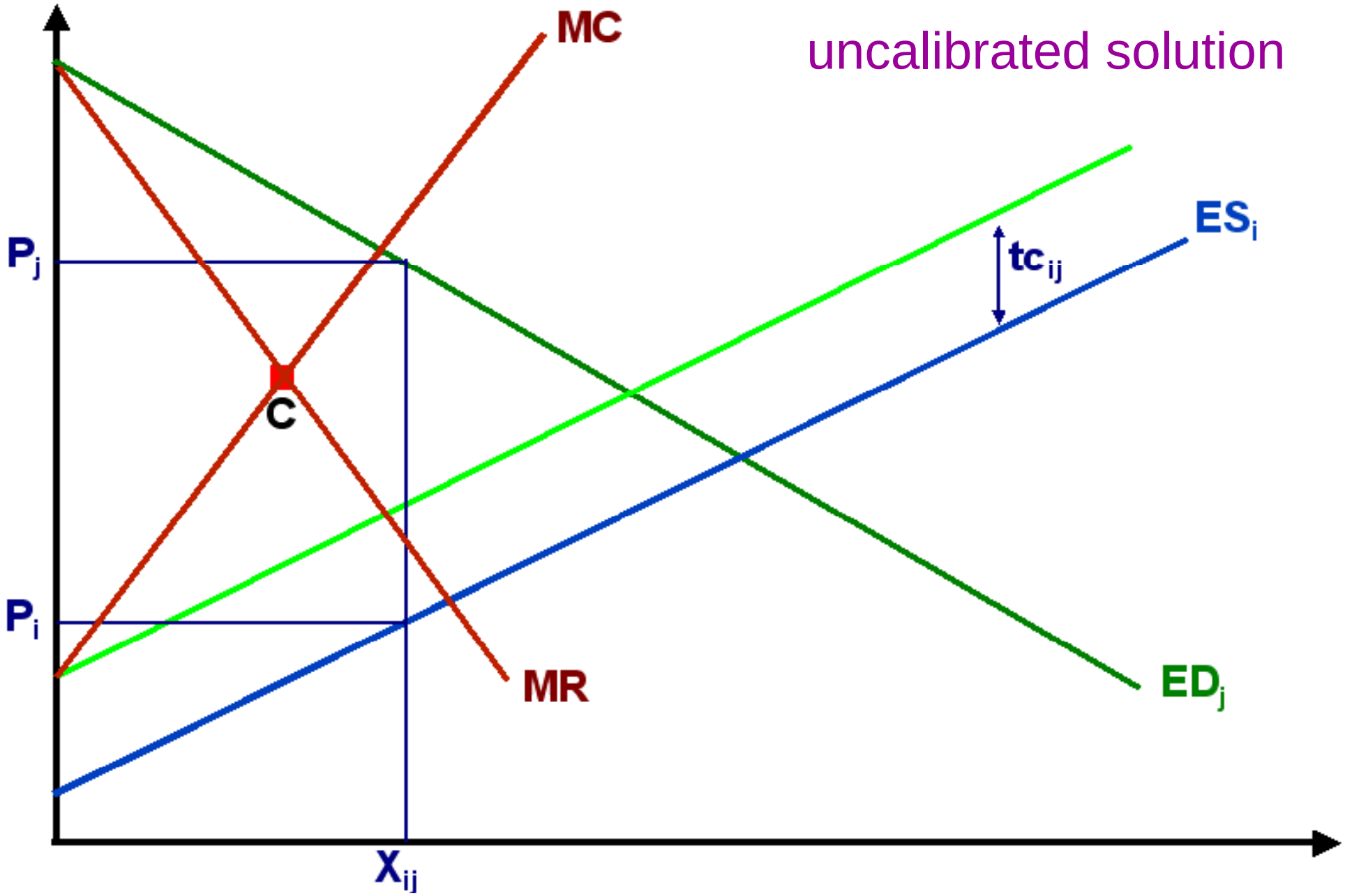
the calibration, mark-up



the calibration, mark-up



the calibration, cartel



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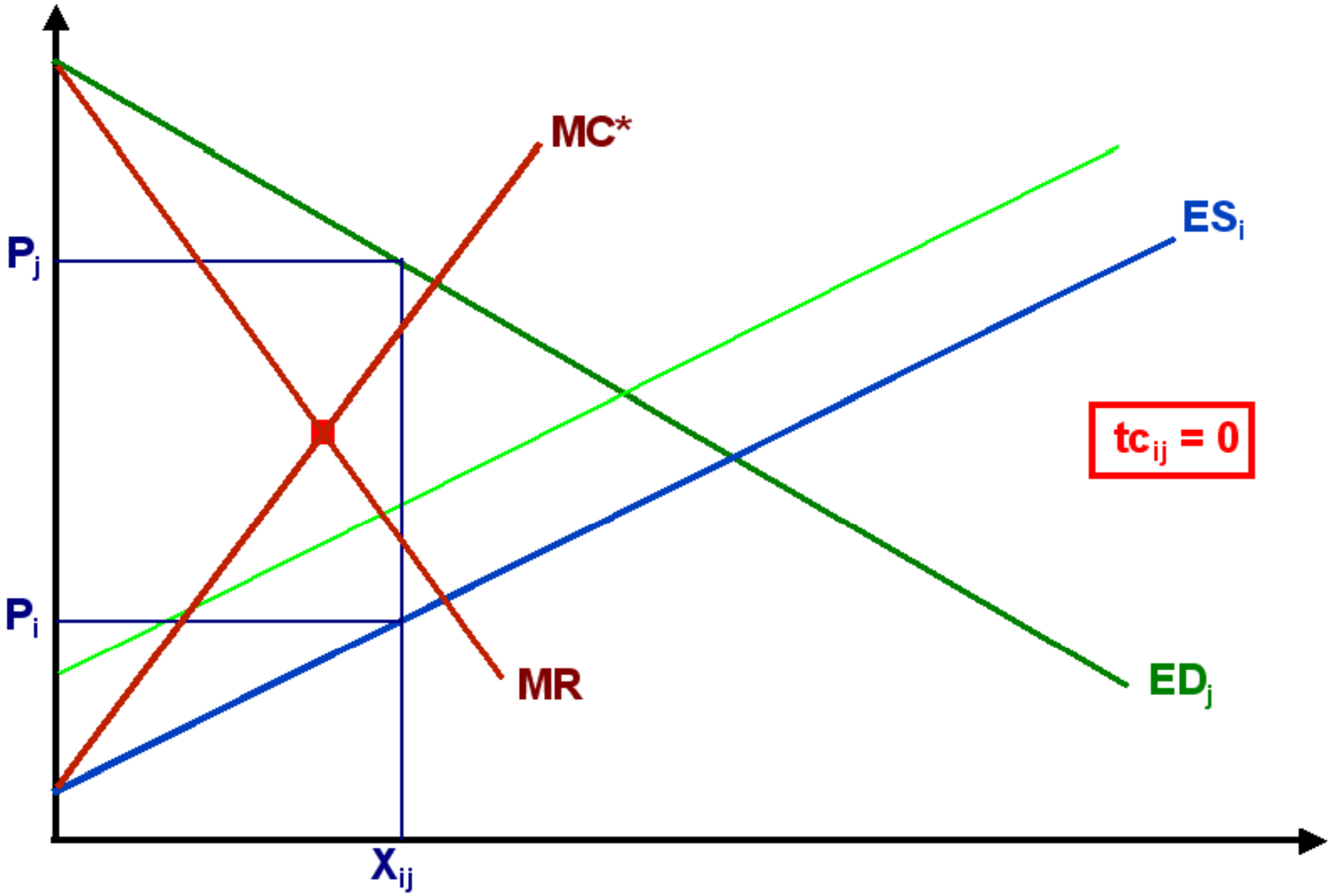
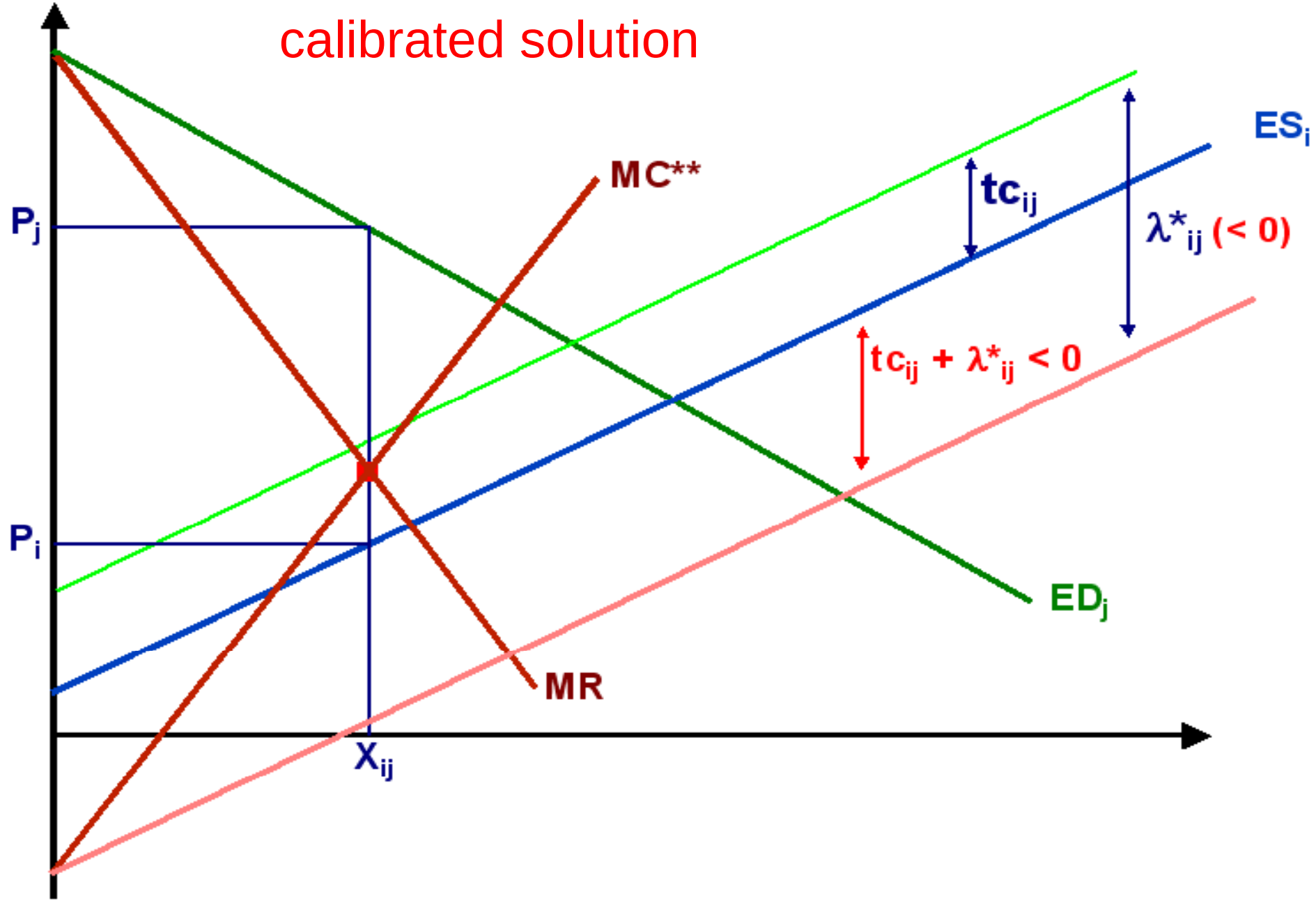


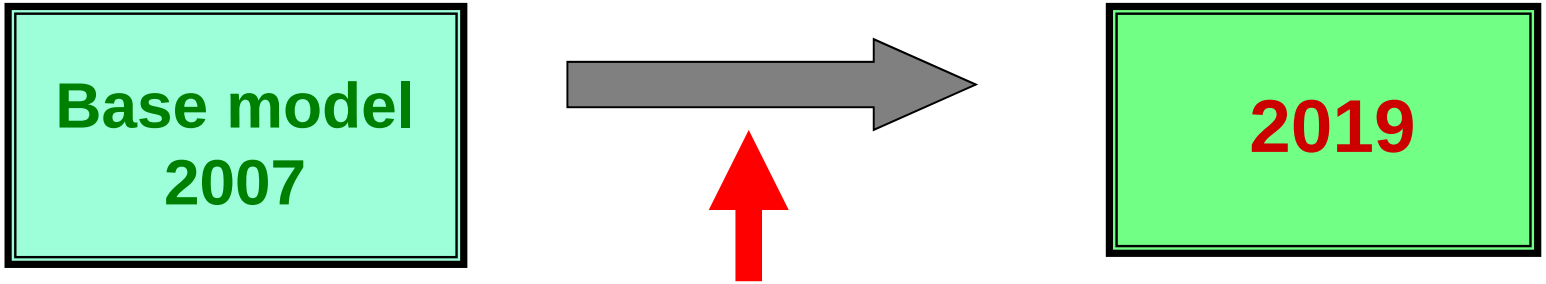
the calibration, cartel



feasible/unfeasible structures for the banana market

- traders colluding by **maximizing joint profits** turns out to be an unfeasible market structure, inconsistent with observed quantities traded and importers and exporters border prices
- downward adjustments of transaction costs needed to calibrate the model range between **750** and **2,700 US$/t** and resulting corrected transaction costs between **-553** and **-2,600 US$** .
- the same result occur for traders imposing a **mark up higher than 12%**

the modeling



***demand* and *supply* shifts in *all* countries (*technical change, per capita income, population*)**

€/$ ex rate = 1.4

the results

	'EPA only' vs. '2019 base'				
	Perfect competition	Mark-up 3%	Mark-up 6%	Mark-up 9%	Mark-up 12%
EU production (000 t)	-0,2	0,0	0,0	0,0	0,0
EU consumption (000 t)	0,6	0,2	-0,3	-0,7	-1,8
EU15 border price (euro)	-1,1	-0,4	0,5	1,3	3,8
EU imports (000 t)	0,6	0,2	-0,3	-0,8	-2,0
EU imports from ACP (000 t)	156,1	160,8	165,7	171,9	170,3
EU imports from MFN (000 t)	-39,0	-57,0	-57,0	-57,1	-57,4
EU imports from LDC (000 t)	-7,1	...	...	...	...
USA imports (000 t)	1,0	1,1	1,2	1,3	0,5
ROW imports (000 t)	1,8	2,0	2,1	2,2	0,7
ACP total exports (000 t)	79,8	81,3	82,9	85,0	83,1
MFN total exports (000 t)	-4,9	-5,2	-5,3	-5,4	-6,4
LDC total exports (000 t)	-7,1	-3,9	-4,1	-4,2	-5,8
ACP export revenue (mill US$)	196,0	199,6	203,6	208,6	202,4
MFN export revenue (mill US$)	-8,4	-8,9	-9,1	-9,3	-11,1
LDC export revenue (mill US$)	-11,5	-6,3	-6,5	-6,8	-9,4
Traders' profits (mill US$)		15,6	16,0	16,4	53,3

the results

	'EPA + Dec 2009 Agreement' vs. 'EPA only'				
	Perfect competition	Mark-up 3%	Mark-up 6%	Mark-up 9%	Mark-up 12%
EU production (000 t)	-0,3	-0,3	-0,3	-0,3	-0,3
EU consumption (000 t)	4,7	4,8	5,0	5,1	5,3
EU15 border price (euro)	-9,7	-9,9	-10,2	-10,5	-10,8
EU imports (000 t)	5,2	5,3	5,5	5,6	5,8
EU imports from ACP (000 t)	-15,0	-15,2	-15,3	-15,5	-15,6
EU imports from MFN (000 t)	95,6	95,2	94,7	94,4	94,1
EU imports from LDC (000 t)	-100,0	-100,0	-100,0	-100,0	-100,0
USA imports (000 t)	-0,7	-0,7	-0,8	-0,8	-0,8
ROW imports (000 t)	-1,2	-1,3	-1,3	-1,4	-1,4
ACP total exports (000 t)	-15,0	-15,2	-15,3	-15,5	-15,6
MFN total exports (000 t)	3,5	3,6	3,6	3,6	3,6
LDC total exports (000 t)	1,2	1,2	1,3	1,3	1,3
ACP export revenue (mill US$)	-26,4	-26,6	-26,8	-27,0	-27,2
MFN export revenue (mill US$)	6,3	6,4	6,4	6,4	6,5
LDC export revenue (mill US$)	2,0	2,0	2,1	2,1	2,1
Traders' profits (mill US$)		-2,2	-2,3	-2,4	-2,4

conclusions

- traders colluding by maximizing joint profits turns out to be an unfeasible structure for the banana world market, inconsistent with observed quantities traded and importers and exporters border prices
- the same is true for oligopsonistic/oligopolistic traders imposing a mark-up higher than 12%

conclusions

- differences in the expected impact of the considered trade policy changes under alternative market structures are relatively narrow
- …not surprisingly, because the feasible market structures are characterized by a relatively low level of market power

conclusions

- **results show that as the feasible degree of market power increases, market structure matters not only in terms of the expected magnitude of the impact on the different agents involved, but in terms of its sign as well.**

the findings of the paper depend upon a number of assumptions:

- bananas are a homogeneous product
- traders do not extend their activities downstream (importing and ripening), or upstream (producing and exporting)
- actors different from the firms operating in international trading (i.e. importers and, even more important, retailers) have no market power
- policy changes have no effect on firm behaviors and market structure.

Thank you!

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