

**The economics of export taxation in a  
context of food crisis :  
a theoretical and CGE-approach  
contribution**

*Antoine Bouet (IFPRI and CATT/UPPA)*

*David Laborde (IFPRI)*

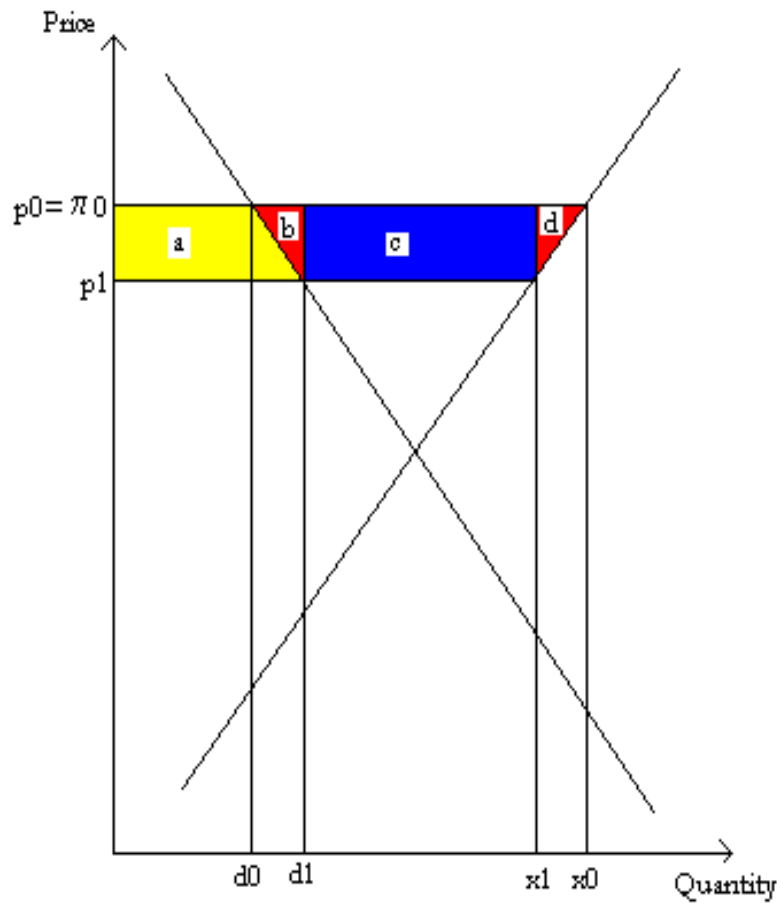
# The economics of export taxation

- The nature of the world trading system is deeply mercantilist... Export taxes much difficult to understand
- Export restrictions are a common practice... in developing countries
- ... and during the food crisis

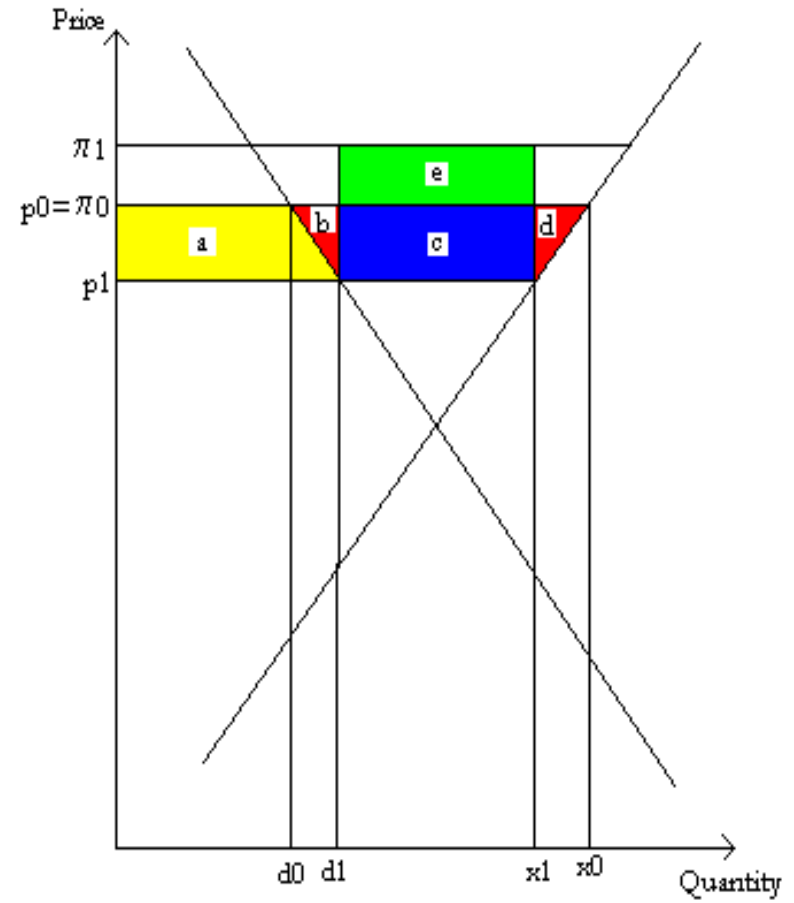
# The economics of export taxation

- Economic rationales of export taxes
  - Partial equilibrium analysis
  - General Equilibrium analysis
- Modeling the implementation of export taxes during a food crisis
  - Use of the MIRAGE model of the world economy
  - Rise of world price of wheat (demand shock)
  - Increase in export taxes and decrease in import tariffs in order to keep domestic price constant

# The economics of export taxation



Small Country



Big Country

# The economics of export taxation

- General equilibrium model with two goods (A and I), three countries
  - two large: ARG is net exporter of agriculture, EU is net importer of agriculture
  - One small: BGD, net importer of agriculture
  - Large vs. Small means Influence or not on world price

# The economics of export taxation

- Country  $i$ 's welfare:  $U_i$
- local demand of country  $i$  for good  $k$  is:  
 $D_i^k, \forall i = \text{ARG, BGD, EU}; \forall k = \text{A, I}.$
- $X_i^k, \forall i = \text{ARG, BGD, EU}, \forall k = \text{A, I}$  : the production of good  $k$  in country  $i$ .
- $\pi^k$  is the nominal world price of good  $k$ ,
- $p_i^k$  is the nominal local price of good  $k$  in country  $i$ .
- $\pi$  is the relative price of good A on world market in terms of industrial good,
- $\pi_i$  within country  $i$ .
- $y_i$  is the real income in country  $i$ , while  $Y_i$  is the nominal income in country  $i$ .

# The economics of export taxation

- Technology is given by “well-behaved” production functions,
- Competition is perfect in each country on both product and factor markets,
- Welfare only depends on local consumption of both goods:
- $U_i = U_i(D_i^A, D_i^I)$  with:  $\frac{\partial U_i}{\partial D_i^k} > 0, \forall i, \forall k.$
- Government selects either an import tariff/subsidy or an export tax/subsidy in order to maximize national welfare function,
- Trade is balanced in each country:
- $X_i^I - D_i^I = \pi_i (D_i^A - X_i^A)$ 
  - Both sides are positive for  $i=EU, BGD$ ; negative for  $i=ARG$ .
- There is no transportation cost,
- The tariff/export tax revenue is redistributed to local consumers by an efficient mean.

# The economics of export taxation

$$dy_{EU} = -M_{EU}^A \cdot d\pi + \pi t dM_{EU}^A$$

$$\frac{dM_{EU}^A}{M_{EU}^A} = \left\{ -\sigma_{EU}^c \cdot \frac{dp_{EU}}{p_{EU}} - \frac{m_{EU}}{1+t} \frac{d\pi}{\pi} - \frac{e_{EU}}{1+t} \frac{dp_{EU}}{p_{EU}} \right\} / d$$

$$d = 1 - [mt/(1+t)]$$



# The economics of export taxation

- **Result 1.** *In the large food importing country, when imposing a tariff, four mechanisms are at play:*
  - *(i) a substitution effect on domestic consumption;*
  - *(ii) a substitution effect on domestic production;*
  - *(iii) improvement of terms of trade;*
  - *(iv) a multiplier effect:*

# The economics of export taxation

$$dy_{\text{ARG}} = E_{\text{ARG}}^A \cdot d\pi + p_{\text{ARG}} t_{\text{ARG}} dE_{\text{ARG}}^A$$

$$\frac{dE_{\text{ARG}}^A}{E_{\text{ARG}}^A} = \left\{ \sigma_{\text{ARG}}^c \cdot \frac{dp_{\text{ARG}}}{p_{\text{ARG}}} + m_{\text{ARG}} (1 + t_{\text{ARG}}) \frac{d\pi}{\pi} + p_{\text{ARG}} \cdot e_{\text{ARG}} \frac{dp_{\text{ARG}}}{p_{\text{ARG}}} \right\} / d_{\text{ARG}}$$

$$d_{\text{ARG}} = 1 - m_{\text{ARG}} t_{\text{ARG}}$$

# The economics of export taxation

- **Result 2.** *In the large food exporting country, when imposing a tariff on its agricultural exports, four mechanisms are at play:*
- *(i) a substitution effect on domestic consumption; -‘food security effect’-;*
- *(ii) a substitution effect on domestic production: ‘anti-farmers effect’ ;*
- *(iii) an improvement of its terms of trade are improved;*
- *(iv) a multiplier effect.*

# The economics of export taxation

$$t_{\text{EU}} = \frac{1}{\sigma_{\text{EU}}^* - 1}$$

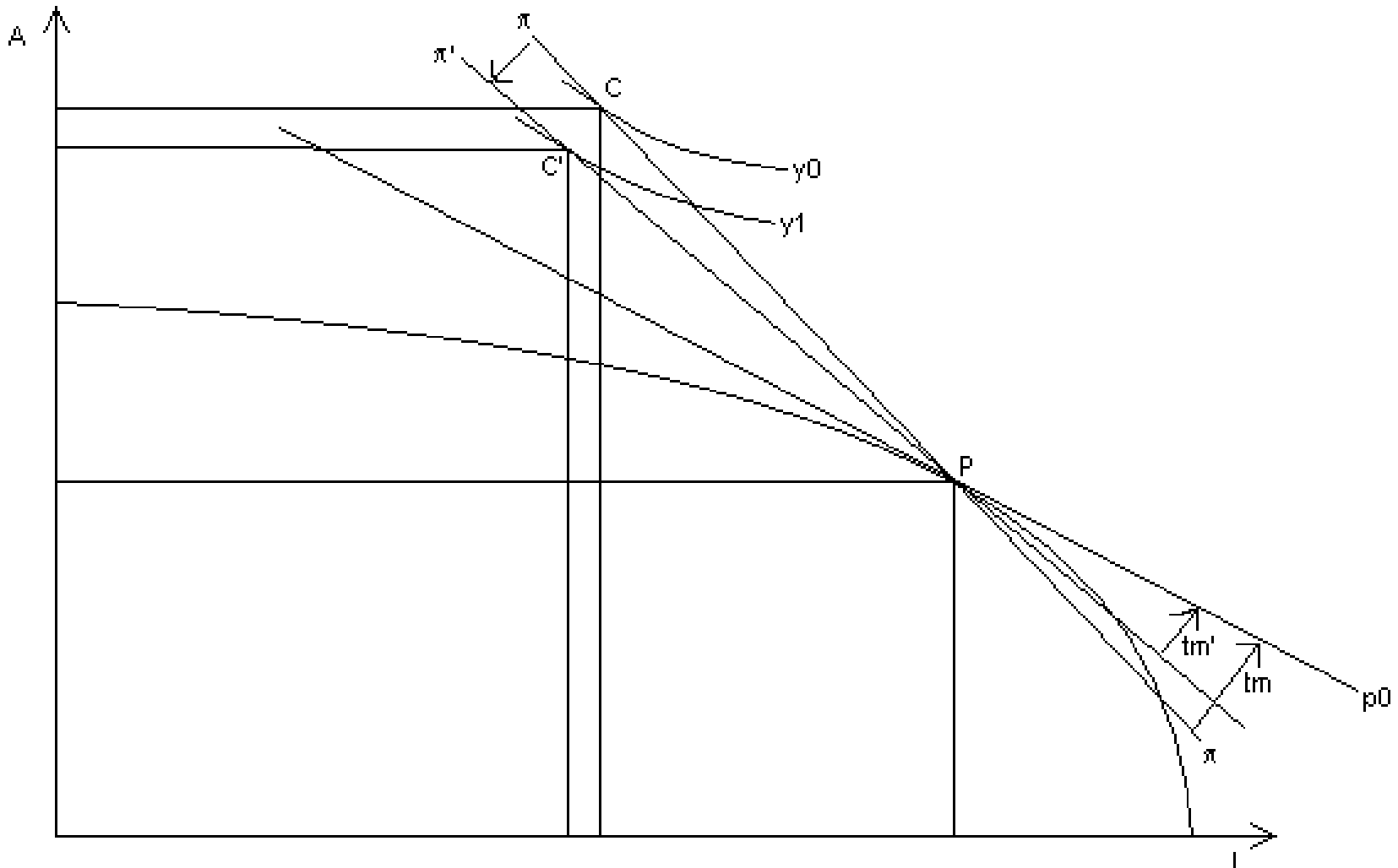
$$t_{\text{ARG}} = \frac{1}{\sigma_{\text{ARG}}^* - 1}$$

$$t_{\text{BGD}} = 0.$$

# The economics of export taxation

- **Result 3.** *Under these assumptions:*
- *(i) each time either the large food importing country or the large food exporting country increases its tax, this move has a double effect.*
  - *The first one is the terms of trade effect*
  - *The second one is a traded volume effect which consists in a decrease of traded volume for both the country which implements the policy and its partner.*
- *(ii) as any policy change in this context has these two effects, it is quite possible that at a stage a country decides to decrease its tax and accept a deterioration of its terms of trade while benefiting from an increase in trade volumes.*
- *(iii) if the objective of a government is a fixed level of domestic price of the agricultural good, after a shock on its world price, the policy to be implemented is:*
  - *a decrease of the import tax in the large food importing country;*
  - *an increase of the export tax in the large food exporting country*
  - *For the third country optimal policy is always free trade.*

# The economics of export taxation





# The economics of export taxation

- Use of MIRAGE
- 27 regions, 25 sectors
- Static and perfect competition version
- Implement a demand shock resulting in a 10% increase in world price of wheat
- Endogenous export taxes in net exporters of wheat with the objective of constant domestic price of wheat
- Endogenous import taxes in net importers of wheat with the objective of constant domestic price of wheat



# The economics of export taxation

Scenario	Description
Base	Base demand shock
ET	Implementation of export taxes in countries net exporters of wheat such that real domestic price of wheat is constant.
IT	Implementation of import taxes (or import subsidies) in countries net importers of wheat such that real domestic price of wheat is constant.
IT0	Implementation of import taxes (import subsidies are forbidden) in countries net importers of wheat such that real domestic price of wheat is constant: domestic price is not constant if the strategic rigidity (no import subsidies) is binding
ETIT	Implementation of IT import taxes in countries net importers of wheat and of export taxes in countries net exporters of wheat such that real domestic price of wheat is constant.
ETIT0	Implementation of IT0 import taxes in countries net importers of wheat and of export taxes in countries net exporters of wheat such that real domestic price of wheat is constant - import subsidies are forbidden

# The economics of export taxation

## Changes in import tariffs

<i>Country/Region</i>	<i>IT</i>	<i>ETIT</i>
<i>Rest of Asia</i>	-19.9%	-19.9%
<i>China</i>	-29.8%	-29.8%
<i>Thailand</i>	-28.1%	-28.1%
<i>Vietnam</i>	-12.6%	-12.6%
<i>Bangladesh</i>	-18.6%	-18.6%
<i>Pakistan</i>	-28.8%	-28.8%
<i>Rest of South Asia</i>	-19.3%	-19.3%
<i>Mexico</i>	-27.5%	-27.5%
<i>Rest of Europe</i>	-32.0%	-32.0%
<i>Rest of Latin America</i>	-30.0%	-30.0%
<i>Brazil</i>	-25.2%	-25.2%
<i>EU27</i>	-32.0%	-32.0%
<i>Rest of CIS</i>	-29.8%	-29.8%
<i>Midde-East and North Africa</i>	-41.9%	-41.9%
<i>Egypt</i>	-25.8%	-25.8%
<i>West Africa</i>	-21.3%	-21.3%
<i>East Africa</i>	-24.3%	-24.3%
<i>Southern Africa</i>	-18.7%	-18.7%
<i>South Africa</i>	-27.7%	-27.8%

# The economics of export taxation

## Changes in export taxes

	<b>ET</b>	<b>ETIT</b>	<b>ETIT0</b>
<b>Australia</b>	3.3%	47.0%	19.0%
<b>India</b>	3.9%	46.0%	21.0%
<b>Canada</b>	3.6%	52.0%	25.0%
<b>US</b>	4.2%	52.0%	27.0%
<b>Argentina</b>	3.8%	50.0%	25.0%
<b>Russia</b>	5.6%	57.0%	37.0%
<b>Ukraine</b>	4.5%	50.0%	50.0%

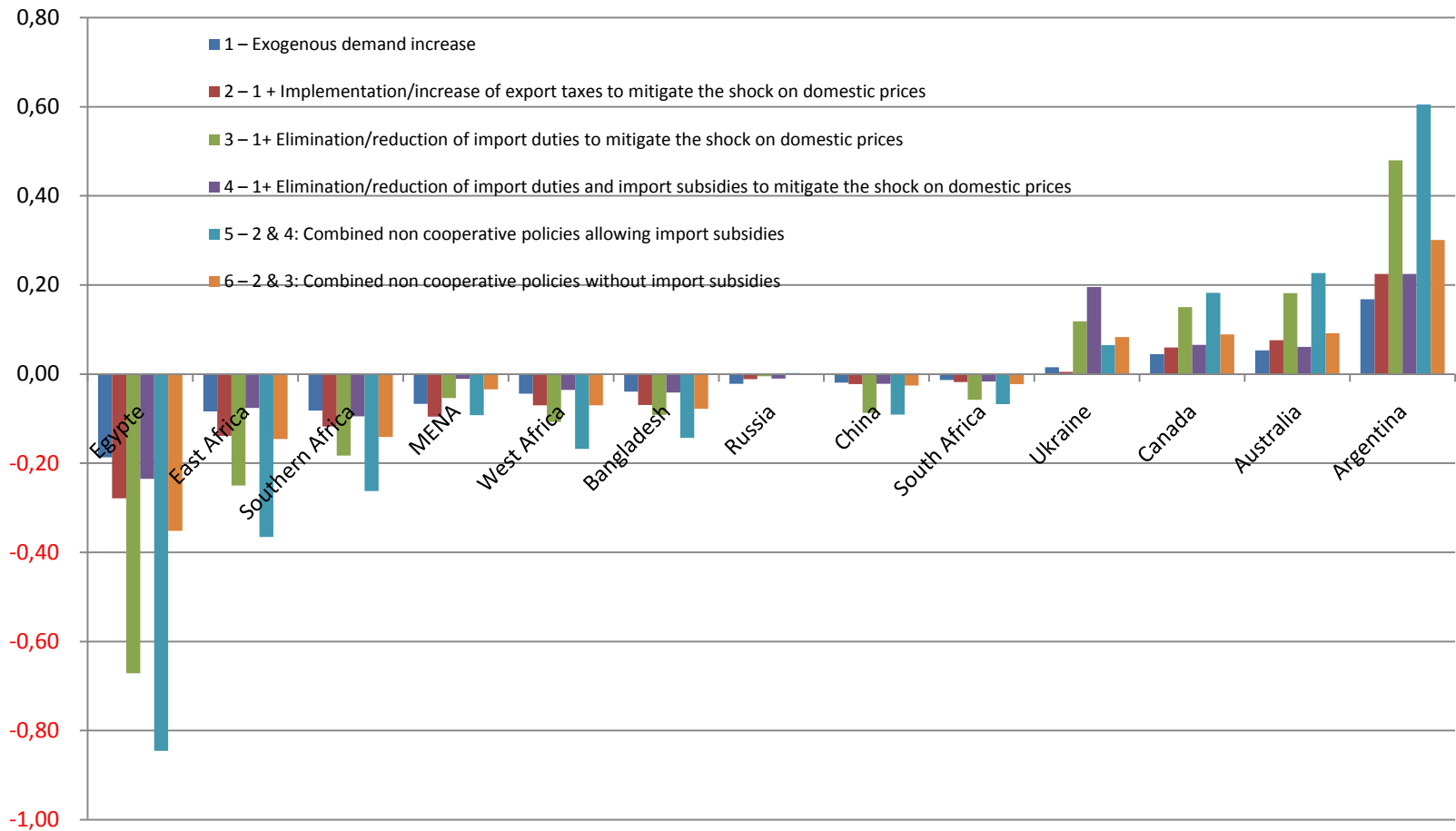
# The economics of export taxation

## Impact on world prices (%)

<b>Sector</b>	<b>Base</b>	<b>ET</b>	<b>IT</b>	<b>IT0</b>	<b>ETIT</b>	<b>ETIT0</b>
<b>Wheat</b>	10.84	16.76	27.31	12.62	41.10	20.58
<b>Dairy products</b>	0.04	0.05	0.00	0.02	0.03	0.04
<b>Livestock</b>	0.19	0.21	0.18	0.13	0.24	0.17
<b>Meat</b>	0.07	0.08	0.06	0.06	0.07	0.07
<b>Oilseeds</b>	0.09	0.06	0.09	0.08	0.05	0.04
<b>Other crops</b>	0.16	0.17	0.18	0.12	0.18	0.13
<b>Other Food</b>	0.04	0.08	-0.04	0.00	0.04	0.04
<b>Paddy and processed rice</b>	0.21	0.13	0.32	0.20	0.10	0.11
<b>Plant fiber</b>	0.13	0.11	0.14	0.10	0.13	0.09
<b>Sugar</b>	0.14	0.12	0.20	0.12	0.16	0.10
<b>Vegetable and fruits</b>	0.20	0.21	0.25	0.14	0.27	0.14
<b>Vegetal Oil</b>	0.01	0.01	-0.01	0.00	0.00	0.00

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## Impact on welfare (%)



# The economics of export taxation

- (i) Terms of trade justification.
  - By restricting its exports a country which supplies a significant share of the world market in a commodity can raise its world price.
- (ii) Food security and net domestic consumers (final consumption price);
  - This objective has often been used during the food crisis of 2006-2008 by governments to justify the implementation of export taxes and other forms of export restrictions.
- (iii) Intermediate consumption price:
  - Export taxes on primary commodities (especially unprocessed) work as an indirect subsidy to higher value-added manufacturing or processing industries.
  - As stated by Corden (1971), *'An export tax on an exportable input reduces its domestic price, and so raises the effective protection for the using industry, irrespective of whether the latter produces an exportable or an importable. Thus a country which exports raw cotton and imposes an export tax on it reduces the costs of its textile industry and hence protects the latter.'*

# The economics of export taxation

- (iv) Public receipts:
  - export taxes provide revenues to developing countries with a poor tax administration.
- (v) Income redistribution:
  - like import tariffs, export taxes are measures that imply a redistribution of income.
- (v) Stabilization of domestic prices :
  - In order to stabilize domestic price for export producers, some developing countries use variable tax rates.

# The economics of export taxation

- This paper provides economic rationales for export taxations, but these are 'beggar-thy-neighbor' policies.
- It implies a cooperative solution (WTO?).
- European proposal to discipline such practices
- the European Union makes a distinction between:
  - trade-distorting taxes
  - and "legitimate" export taxes like those applied in the context of Balance-of-Payments imbalances.
- The EU proposes a full prohibition of trade-distorting export taxes.
- The EU and the US frequently implement bans of export taxes in bilateral agreements that they negotiate.



# The economics of export taxation

- This proposal has been well received by countries like Canada, the US, Switzerland, and Korea,
- it has been highly criticized by some developing countries like Argentina, Malaysia, Indonesia, Brazil, Pakistan, Cuba, India, and Venezuela, with Argentina leading the opposition to this proposal.
- The reasons advanced by this group of countries is that “export taxes are a right and a legitimate tool for developing countries; they help increase fiscal revenue and stabilize prices; there is no legal basis for a negotiation; there is no explicit mandate for a change in WTO rules on this issue” (Raja, 2006).

# The economics of export taxation

- Our paper shows that:
  - Increased export taxes can amplify increase of agricultural world prices;
  - But reduced import taxes also contribute to this process;
  - This can be highly detrimental for small net food importing countries.