Export tariffs combined with public investments as a forest conservation policy tool

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October 24, 2018

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Overview

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Introduction

- REDD+ program: finances activities to reduce emissions from deforestation and forest degradation, to conserve and enhance forest stocks, or to sustainably manage forests in developing countries (decision 4/CP.15 UNFCCC, 2009).
- Individual opportunity cost of land owners project approach was estimated to be comparably low (Eliasch, 2008).
- Approach appeared insufficient to address the structural drivers of deforestation (Hett et al., 2012; Sayer et al., 2013).
- UNEP (2015): Integrated jurisdictional approach is required.

Central questions

1. What are the main challenges to fiscal measures for forest conservation in low income countries?
2. Can we think of a fiscal policy that appears feasible in low income countries?

Overview

(i) Undiversified land-intensive economies
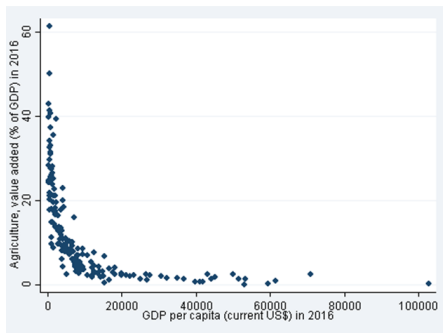
Data source: World Bank, 2016.

- In low income countries economic growth is mostly driven by a land-intensive agricultural sector.
- Undiversified economies have fewer economic alternatives to land demanding agricultural activities.

(ii) Food insecurity
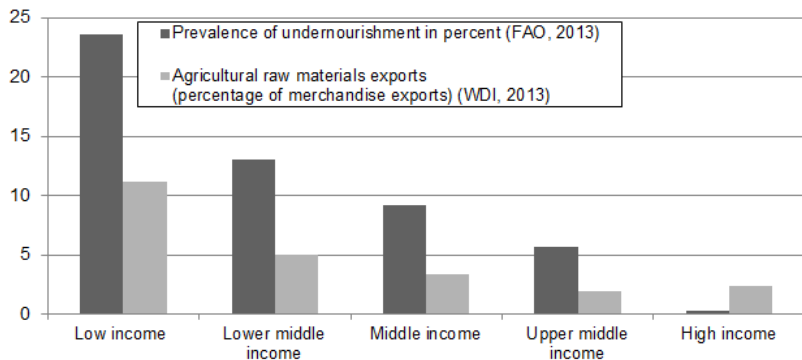
- In low and lower middle income countries the prevalence of undernourishment and the share of agricultural raw materials in exports are highest (FAO, 2013).
- High dependence on the land demanding agricultural sector and is likely to entail resistance to policies that restrict the access to land.
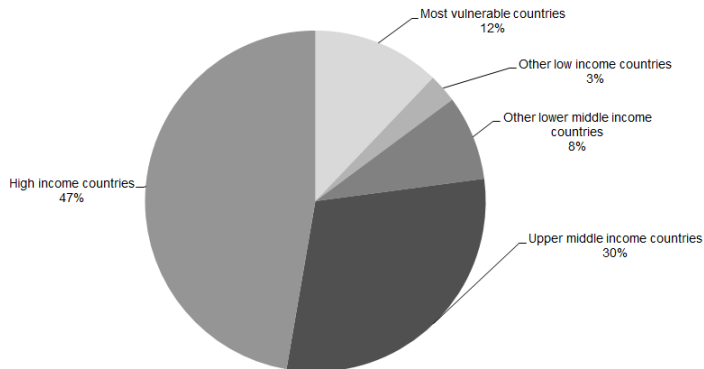
(iii) Weak political institutions

- Weak political institutions limit forest conservation directly through reduced enforcement capacity (e.g. Arcand et al., 2008; Bohn and Deacon, 2000).
- They also prevent economic diversification because countries are trapped in economic activities that do not rely on complex contractiing institutions (Acemoglu, 2005).

All factors tend to coincide in the same countries

- Category of "most vulnerable countries" host more than 474.7 Mha forests, corresponding to 12% of world's forests with 168 Mha of primary forest, corresponding to 13% of the world's remaining primary forests (FAO, 2015)).

Most vulnerable countries
12%

Other low income countries
3%

Other lower middle income
countries
8%

Upper middle income countries
30%

High income countries
47%

Overview

Export tariffs

- Theoretical (Bernhofen, 1997; Rodrik, 1989) and empirical (Solberg et al., 2010a) economic literature finds that export tariffs on unprocessed commodities can stimulate the structural transformation of an economy.

- Trade liberalization has accelerated deforestation in tropical countries (Barbier, 2000; Pacheco, 2006; Shandra et al., 2009).

- In the case of timber exports, the introduction of export tariffs has reduced deforestation (Maested, 2001).

- Implementation does not require very sophisticated political institutions (Skinner, 1991; Younger et al., 1999).

- One of the few tolerated trade policy instruments under WTO rules (GATT article 2; 11.1 and 11.2 (WTO, 1947).

Public investments

- Investments into institutions bear the potential to reduce deforestation (Culas, 2007; Wolfersberger, 2015).
    - E.g. the allocation of land tenure rights (Mendelssohn, 1994; Robinson et al., 2014)
- Certain types of public infrastructure investments bear the potential to reduce deforestation
   - E.g. electrification (Assuncao et al., 2015)

Method: Two agricultural sectors with different elasticities of demand

- We use a partial equilibrium competing land use model.
- Sector 1 (F_1) produces staple food. The local demand for food products is inelastic $\theta_1 = 0$.
- Sector 2 (F_2) exports internationally. Demand is perfectly elastic $\theta_2 = \infty$ and determined by international market prices p_2.

Food producing sector ($\theta = 0$)   Exporting sector ($\theta = \infty$)
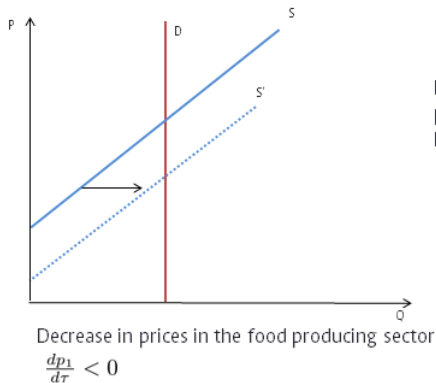
By equalizing the land prices of both sectors the equilibrium effects can be analyzed.
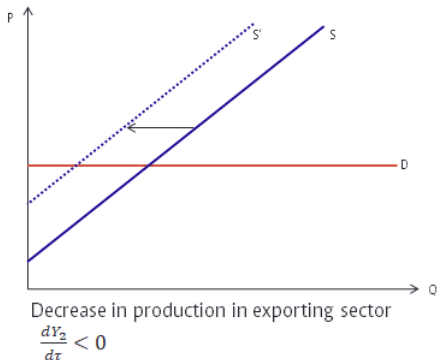
Decrease in input use in the exporting sector $\frac{dL_2}{d\tau} < 0$

$\downarrow$

Decrease in deforestation

Decrease in production in exporting sector $\frac{dY_2}{d\tau} < 0$
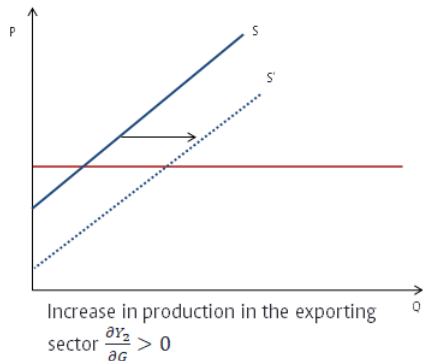
Results: Effect of a tariff increase on the food producing sector

Decrease in land price in the food producing sector → increase in land use $\frac{dL_1}{d\tau} > 0$

↓

Increase in deforestation

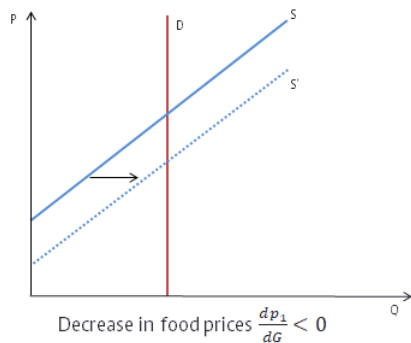Decrease in prices in the food producing sector
$\frac{dp_1}{d\tau} < 0$

Results: Effects of public investments on the exporting sector (Jevons effect)

Increase in input use in the exporting sector $\frac{dL_2}{d\tau} < 0$

$\downarrow$

Increase in deforestation

Increase in production in the exporting sector $\frac{\partial Y_2}{\partial G} > 0$

# Results: Effect of public investments on the food producing sector (Borlaug effect)

Decrease in input demand due to a substitution effect $\frac{dL_1}{dG} < 0$

$\downarrow$

Decrease in deforestation

Decrease in food prices $\frac{dp_1}{dG} < 0$

Stakeholder constraints

- **Government**: accepts no additional public expenditures for forest conservation
- **Exporting sector**: wants to maintain production
- **Food producing sector**: wants to maintain production
- **Population**: would not accept an increase in food prices
- **International REDD+ donor**: willing to make a payment, if forests are conserved

Results: Combining both policies
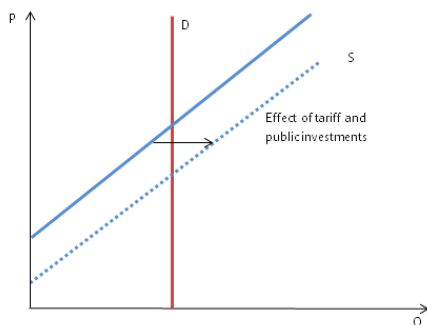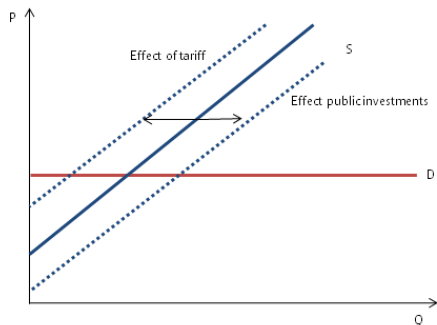
- For any level of G it is possible to raise τ s.t.
  - (i) production in the export sector remains constant
  - (ii) there is a net reduction in deforestation
  - (iii) food prices decline

Results: Numerical example
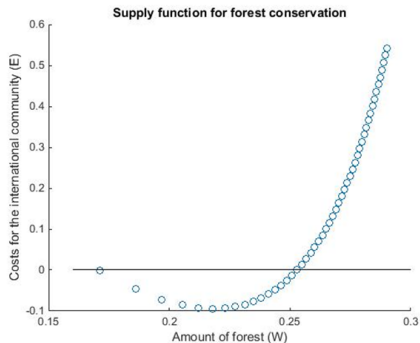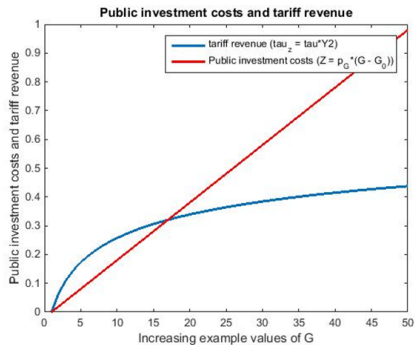
Overview

Discussion: Possible secondary effects

- Warr (2001) looks at the case of Thailand's rice export tariffs and find that they reduce consumer prices, producer prices and the real wages of unskilled labor.
- Dennis and Iscan (2011) find that distortionary agricultural policies reduce the real wage and bring it closer to the subsistence level, whereby the structural transformation of the economy is delayed.
- In our model consumer prices also decline as a consequence of the proposed policy mix.

Discussion: Possible secondary effects

- However, given the public investments, production costs also decline. Hence production levels and thus the required labor input can be assumed to remain constant, even if the model does not explicitly analyze labor market effects.

- The difference is the reinvestment of tariff revenues into productivity enhancing public infrastructures or institutions.

- The policy mix provides disincentives to deforest and incentives to substitute the input factor deforested land with public infrastructures and institutions.

- In the long run, higher economic growth rates can be expected, since the policy induces a more quality oriented model of development.

Historical export tariff levels
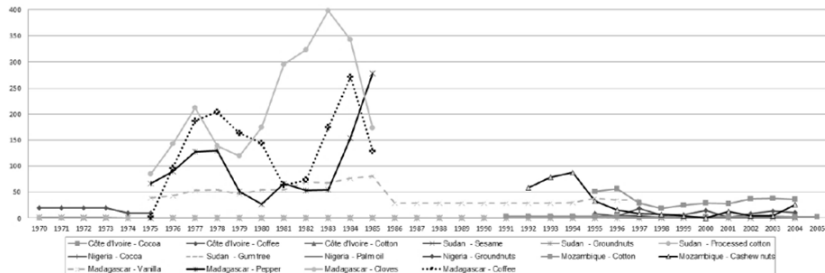
- According to the OECD (2014) a range of countries have reintroduced export tariffs during the last decade as a reaction to food price crisis.
- This rising use of export tariffs contrasts with declining trend in other restrictive trade policy instruments that are less deployed due to WTO rules.

- How can fiscal policy approaches be supported by the international community through existing programs (like REDD+)?

Thank you for your attention!

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