

Brazilian biofuels policies and impacts on world agricultural trade

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Introduction

Since end of 1980's, there has been a reduction in governmental intervention in sugarcane production and distribution chain in Brazil.



Source: photo of Tadeu Fessel, courtesy of UNICA (At: <http://www.unica.com.br/noticias/>)

Currently, there is a mandate for blending anhydrous ethanol with gasoline, which relates to inflation control's policy. Government establishes the blend of ethanol in gasoline according to gasoline prices and ethanol supply conditions.

Since 2004, because of flex-fuel technology there has been an increasing demand for hydrated ethanol, which is used as a substitute for gasoline in Brazil; and a surge in investments (BNDES and FDI) to sugarcane processing plants.

Ethanol exports are increasing, however their performance is jeopardized by trade barriers in importing countries (Table 1).

Table 1 – Import tariffs for biofuels in selected countries.

| Countries | Ethanol ¹ | Biodiesel ¹ |
|--------------------|--|------------------------|
| USA | 2.5% + US\$14 cents/liter (~ 46% ad valorem) | 2.06 % |
| India | 186 % | 12.5% |
| Canada | 4.92 US\$ cent/liter | 0.48% |
| EU | 19.2 €/hl (63% ad valorem) | 4.57% |
| China | 30% | 7% |
| Brazil | 20% | 8.22% |
| Japan ² | 13.4 % + 38.1 yen/liter | 1.32 % |

Source: ¹Dufey (2009) Applied average tariffs for 2009- WITS (2010); ³ <http://tariffanalysis.wto.org>, WTO (2010).

International negotiations to biofuels are being conducted by AoA and by NAMA (biodiesel), but Brazil supports that ethanol is an environmental good at CTE-SS,

Objectives

- Analyze impacts of Brazilian biofuel policies (particularly, ethanol consumption mandate) on global markets for biofuels and agricultural products;
- Discuss different scenarios for Brazilian biofuel exports with shifts in domestic supply, negotiations on trade barriers in biofuels, and trends in gasoline prices; and
- Describe current biofuel policies in Brazil.

Methodology

- PEATSim - Partial Equilibrium Agricultural Trade Simulator (Stout and Abler, 2004)
- 13 countries/regions
- 32 products, including a biofuel module (ethanol, biodiesel and DDG) – Peters et al (2009)
- Gross trade model
- Base year: 2008 and projection time path until 2017

Contribution of this paper: updated elasticities to model Brazilian ethanol; and projections on ethanol production (due to recent investments in Brazil)

Shocks: changes in consumption mandate; in BR sugar production and in tariffs charged by major players on ethanol.

Results and Discussion

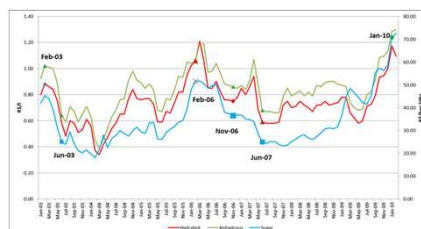


Figure 1. Brazilian domestic prices: ethanol/sugar and government rules for gasoline blend. Source: Cepea and MAPA.

Note: Before Feb/2003, blend of 25%; Feb/03 (20%); June/03 (25%); Feb/06 (20%); Nov/06 (23%); June/07 (25%); Jan/10 (20%); May/10 (25%)

Scenario 1 – No tariff liberalization or neither changes in Brazilian mandate, only gas prices increasing 5% yearly.

- World ethanol prices increase by 0,31% with relation to baseline
- United States becomes exporter of ethanol

Scenario 2 – No tariff liberalization, only gas prices increasing 5% each year and reduction on BR mandate to 20% ethanol blend (-5.6% of domestic ethanol demand)

- World ethanol prices decrease by 7.4% and sugar prices do by 0,3%
- Brazil increases exports by 12.3% for ethanol and 0,36 for sugar

Scenario 3 – Ethanol tariff liberalization – cut of 20% each year; reduction of blend in consumption mandate in BR; gas prices increasing 5% yearly.

| % (Change with relation to baseline) | USA | Brazil | EU | India | China |
|--------------------------------------|--------|--------|--------|-------|-------|
| Production | -0.9 | 2.4 | -5.7 | 0.6 | 2.8 |
| Consumption | 4.3 | -14.1 | 27.8 | -0.6 | -10.6 |
| Export | -100.0 | 169.0 | 0.0 | 18.1 | 83.8 |
| Import | 965.5 | 0.0 | 2864.1 | 7.2 | 0.0 |
| Domestic price (consumer) | -4.5 | 24.0 | -32.5 | 7.2 | 23.7 |
| World Price | 24.4 | | | | |

- Although BR sugar production increases 0,36%, exports decreases and world prices varies by 0.6%

Scenario 4 – Ethanol tariff liberalization – cut of 20% each year; reduction of blend in consumption mandate in BR; gas prices increasing 5% yearly; and an addition of 23% of sugar production in Brazil (due to new investments)

| % (Change with relation to baseline) | Ethanol | | | | |
|--------------------------------------|---------|----------|--------|---------|--------|
| | USA | Brazil | EU | India | China |
| Production | -1.0 | 3.3 | -5.2 | 2.0 | 2.8 |
| Consumption | 4.7 | -13.9 | 28.2 | -0.6 | -10.4 |
| Export | -100.0 | 177.4 | 0.0 | 39.7 | 82.1 |
| Import | 1062.1 | 0.0 | 2854.7 | 6.6 | 0.0 |
| Domestic price (consumer) | -4.9 | 23.4 | -32.8 | 6.6 | 23.1 |
| World Price | 23.8 | | | | |
| % (Change with relation to baseline) | Sugar | | | | |
| | USA | Brazil | EU | India | China |
| Production | 0.0014 | 13.0367 | -5.323 | -4.60 | -5.56 |
| Consumption | 0.0019 | 2.8832 | -0.56 | 1.38 | 1.57 |
| Export | -0.0274 | 26.3548 | -90.69 | -100.00 | -2.42 |
| Import | 0.0000 | 0 | 4.79 | 359.24 | 11.56 |
| Domestic price (consumer) | -0.2105 | -17.6746 | -9.42 | -14.25 | -17.20 |
| World Price | -17.7 | | | | |

- If tariff liberalization is promoted to ethanol, without any shocks on sugar and ethanol demand and production in Brazil, world prices for ethanol increases by 26.6% with relation to baseline.
- If tariff liberalization is also promoted to biodiesel, to all countries, a reduction of 20% each year, biodiesel prices are expected to increase by 5.1%

Conclusions

Brazil has reduced its governmental intervention on sugarcane, sugar and ethanol markets. However, currently, there are still a few policies that affect them. Illustratively, there is a blend mandate of anhydrous ethanol to gasoline, which varies from 20% to 25%.

All scenarios for gasoline prices increases and general tariff cuts for ethanol has produced a higher world price at the end of the projected time path. However the effect seems to be related to the tariff liberalization.

Reductions on BR consumption mandate (blend dropping to 20% of ethanol to gasoline) generates increases in Brazilian exports and no significant effect on sugar exports. However, if an additional production of sugar is projected in Brazil, it is expected to decrease the sugar world price.

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