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# **Industrial Environmental Impacts of FTAA in Brazil**

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# Objectives

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To estimate impacts on pollution and natural resource uses in the Brazilian industrial sector from trade liberalization with the FTAA

# Methodology

Following Grossman and Krueger (1993) measures are given by the product of sectoral changes estimated in a CGE model and the sectoral pollution and resource use coefficients.

Restriction: CGE is static and does not account for capital flows

Improvement: pollution and uses estimated by residual (after control) and not potential indicators

# CGE modeling

CGE model results, Tourinho and Kume (2002), related to USA imports (80% of the total), as such:

- (i) imports: reducing effective tariffs actually paid that are captured in the National Accounts figures; and
  
- (ii) exports: reducing nominal and *ad-valorem* tariffs over 5% rate and plus elimination of anti-dumping and quota tariffs.

# CGE Results

- Production increases dominate in sugar, shoes and leather goods, steel and iron and vegetable goods (from 3.6 to 13.7%) leading to high export increase
- Imports would increase in several industrial sectors, as for example, vehicle assembly and wood and furniture.

## **Pollution And Use Coefficients**

<b>Resource</b>	<b>Dataset</b>
<b>Water-organic</b>	<b>São Paulo EPA</b>
<b>Water-inorganic</b>	<b>São Paulo EPA</b>
<b>Air-SO<sub>2</sub></b>	<b>São Paulo EPA</b>
<b>Air-TSP</b>	<b>São Paulo EPA</b>
<b>Energy use</b>	<b>Energy data</b>
<b>CO<sub>2</sub></b>	<b>Energy data and inventory</b>
<b>Water use</b>	<b>External source</b>

# Environmental impacts

<b>Pollutants</b>	<b>Particulates (ton)</b>	<b>SO<sub>2</sub> (ton)</b>	<b>Organic matters (ton)</b>	<b>Inorganic matters (ton)</b>	<b>CO<sub>2</sub> (ton)</b>	<b>Energy Use (Gwh)</b>	<b>Water Use 10<sup>3</sup>m<sup>3</sup></b>
<b>Indicators</b>	- 0,3%	-0,1%	2,7%	1,1%	1,9%	0,3%	1,1%
<b>Product</b>	-0,8%	0,5%	13,9%	6,0%	12,0 %	3,3%	5,5%
<b>Exports</b>	1,4%	2,9%	5,0%	3,0%	2,6%	4,4%	3,5%
<b>X-M</b>	-1,0%	-5,4%	26,6%	23,6%	32,5 %	-2,7%	11,3%

# **Environmental Impacts Summary**

**(i) lower pollution intensity in air pollution of particulates and SO<sub>2</sub> and energy uses; and**

**(ii) higher pollution intensity in water pollution and uses and CO<sub>2</sub> emissions;**

# Sectoral Performance

Increasing impacts: sugar, steel&iron, shoes&leather and processing of vegetable goods (cocoa, rice, tobacco, fruits, etc)

Export-oriented sectors with systems of environmental control & technological research centers

Performance may still advance with increasing exposure in USA markets and new investment flows

# Caveats

- **CGE models highly dependent on averaging procedures and static approaches**
- **Dynamic effects from investment and R&D may exceed static results**

# Recommendations

(i) Closer cooperation and integration of environmental and trade policies at ministerial levels.

(ii) As water pollution and uses seems to be the main potential impact of FTAA, stimulate the current initiatives for the application of water charges.

# Recommendations

(iii) Utilize subsidized credits to strengthen ties between access to this credit and environmental compliance status.

(iv) Promote the interchange of the existing private research centers of the leading industrial sectors with international public research centers

(v) Create mechanisms that facilitate local communities to access information about firms' environmental performance and thereby add complementary efforts on enforcement.