red mercosur

Mesa Redonda: ¿Es el ALCA un buen negocio para los países del Mercosur?

An agriculture exporter industry for MERCOSUR: the case of orange juice

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Object

Examine the resource allocation and welfare implications of the reduction of barriers in the United States market for Frozen Concentrated Orange Juice (FCOJ) imported from MERCOSUR, or more precisely, from Brazil.

Methodology

A partial equilibrium model of imperfect substitute goods is used to estimate the impact of trade liberalization in the United States, on prices and quantities and on welfare.

Orange and FCOJ Main Producers

Oranges and FCOJ main producers

Countries	Orange*		FCOJ**	
	Thousand Ton	%	Ton, 65° brix	%
Brazil	15,953	33.9	1, 106,000	46.5
USA	11,980	25.5	1,064,102	44.8
Mexico	3,100	6.6	44,000	1.9
Spain	2,828	6.2	45,500	1.9
Others	13,156	28.0	116,529	4.9
Total	47,017	100.0	2,376,131	100.0

Sources: *USDA – United States Department of Agriculture – World Horticultural trade & USA Export Opportunities – February 2001.
** National Agricultural Statistic Service and USA Department of Commerce, Bureau of Census. Florida Department of Citrus. Reports from USA Agricultural counselors and Attachés and/or USDA/FAS Estimates.

Compared Production Costs Brazil and USA

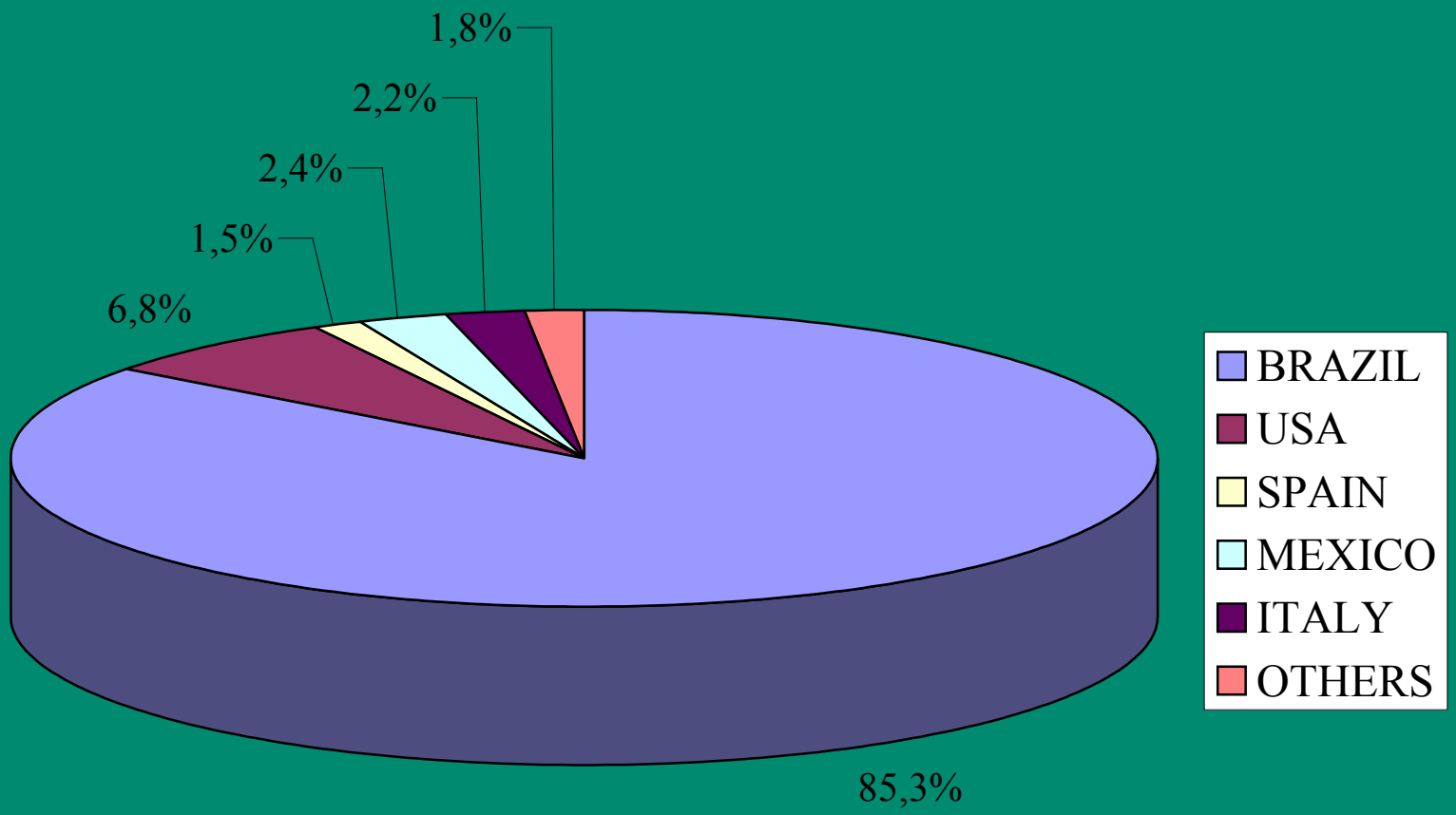
Compared operational costs - Sao Paulo* and Florida**

Operational Costs	Sao Paulo	Florida
Insecticides	312. 59	51.01
Fungicides	53.83	104.83
Herbicides	12.60	230.73
Fertilizers	214.23	306.62
Operations	333.41	768.27
Irrigation	0.00	372.03
Labor	129.83	178.33
Cost ($/Ha)	1056.48	2011.82
Cost ($/box)	1.27	1.87

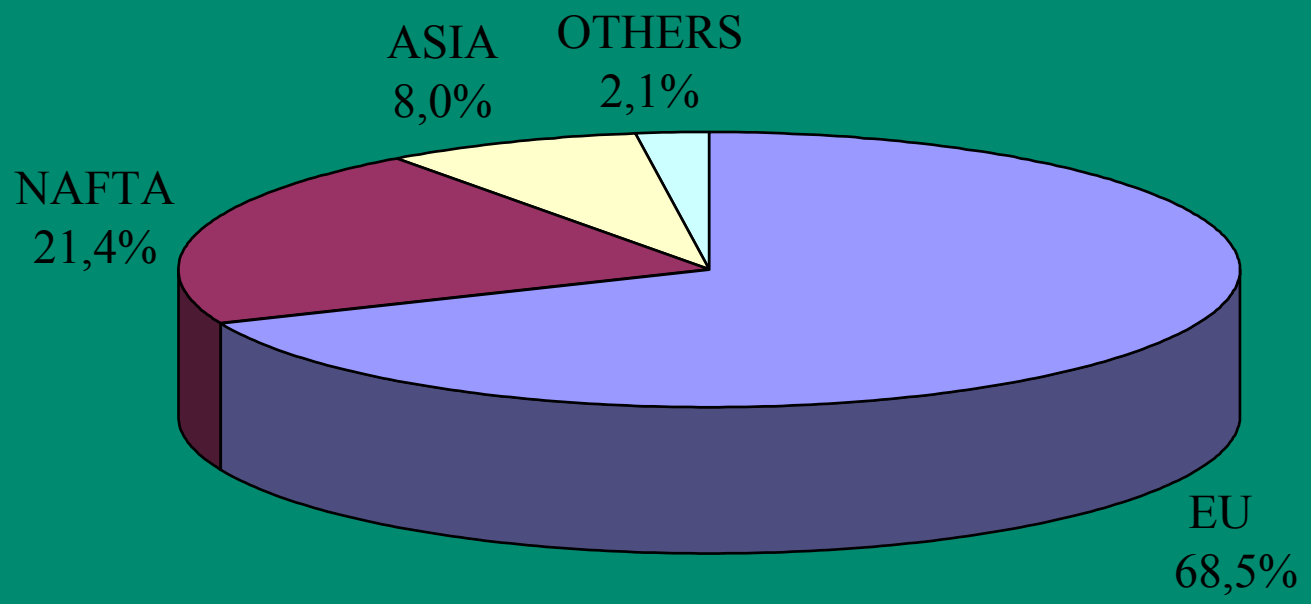
Source: Pozzan, M., Muraro, R. and Ueta, F.Z., "Realidades Distintas", Agroanalysis, revista de Agronegócios da FVG, Agosto 2002. Brazilian data are collected by IEA – Instituto de Economia Agrícola, São Paulo State Department. Florida data were published in *Budgeting Costs and Returns for Southeast Florida Citrus Production, 2000-2001*, October 2001, UFL publication.

*2001/2002 harvest. ** 2000/2001 harvest

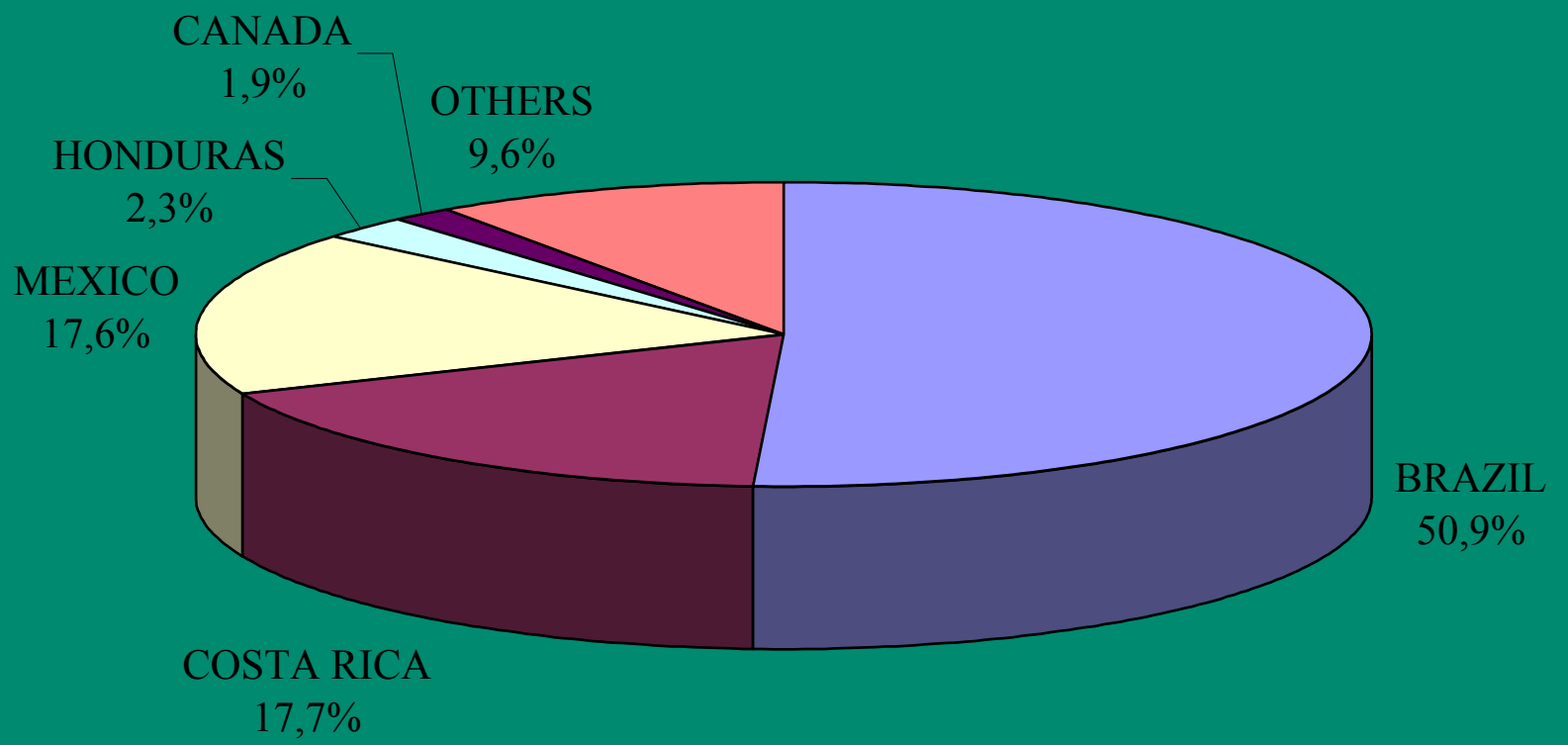
Main World FCOJ'Exporters 2000/2001



Brazilian FCOJ Exports' Destinations 2000/2001



USA's FCOJ Imports: 2001/2002



Small and Large Country Models

Hufbauer & Elliot (1994), Francois & Hall (1997)

Berlinski et al. (2001)

Main assumptions of a Small Country Model

- The supply schedule of the domestically produced good is positively sloped;
- The price elasticity of supply of the imported good is infinite;
- The initial situation is an equilibrium state.

Main assumptions of a Large Country Model

- The importer country is large and hence able to influence the prices of goods on world markets.

Small Country Model

$$
\begin{cases}
\ln D_d = \ln a + \varepsilon_{dd} \ln p_d + \varepsilon_{dm} \ln p_m \\
\ln S_d = \ln b + \varepsilon_s \ln p_d \\
\ln D_d = \ln S_d \\
\ln p_m = \ln[p^*(1+t)] \\
\ln D_m = \ln c + \varepsilon_{md} \ln p_d + \varepsilon_{mm} \ln p_m
\end{cases}
$$

Large Country Model

$$
\begin{cases}
\ln D_d = \ln a + \varepsilon_{dd} \ln p_d + \varepsilon_{dm} \ln p_m \\
\ln S_d = \ln b + \varepsilon_s \ln p_d \\
\ln D_d = \ln S_d \\
\ln p_m = \ln[p^*(1+t)] \\
\ln D_m = \ln c + \varepsilon_{md} \ln p_d + \varepsilon_{mm} \ln p_m \\
\ln S_m = \ln d + \varepsilon_{sm} \ln p^* \\
\ln S_m = \ln D_m
\end{cases}
$$

Elasticities And Parameters' Estimations

$$\varepsilon_{11} = -[(1 - S_1) \times \sigma + (S_1 \times \varepsilon_T)]$$

$$\varepsilon_{22} = -[(1 - S_2) \times \sigma + (S_2 \times \varepsilon_T)]$$

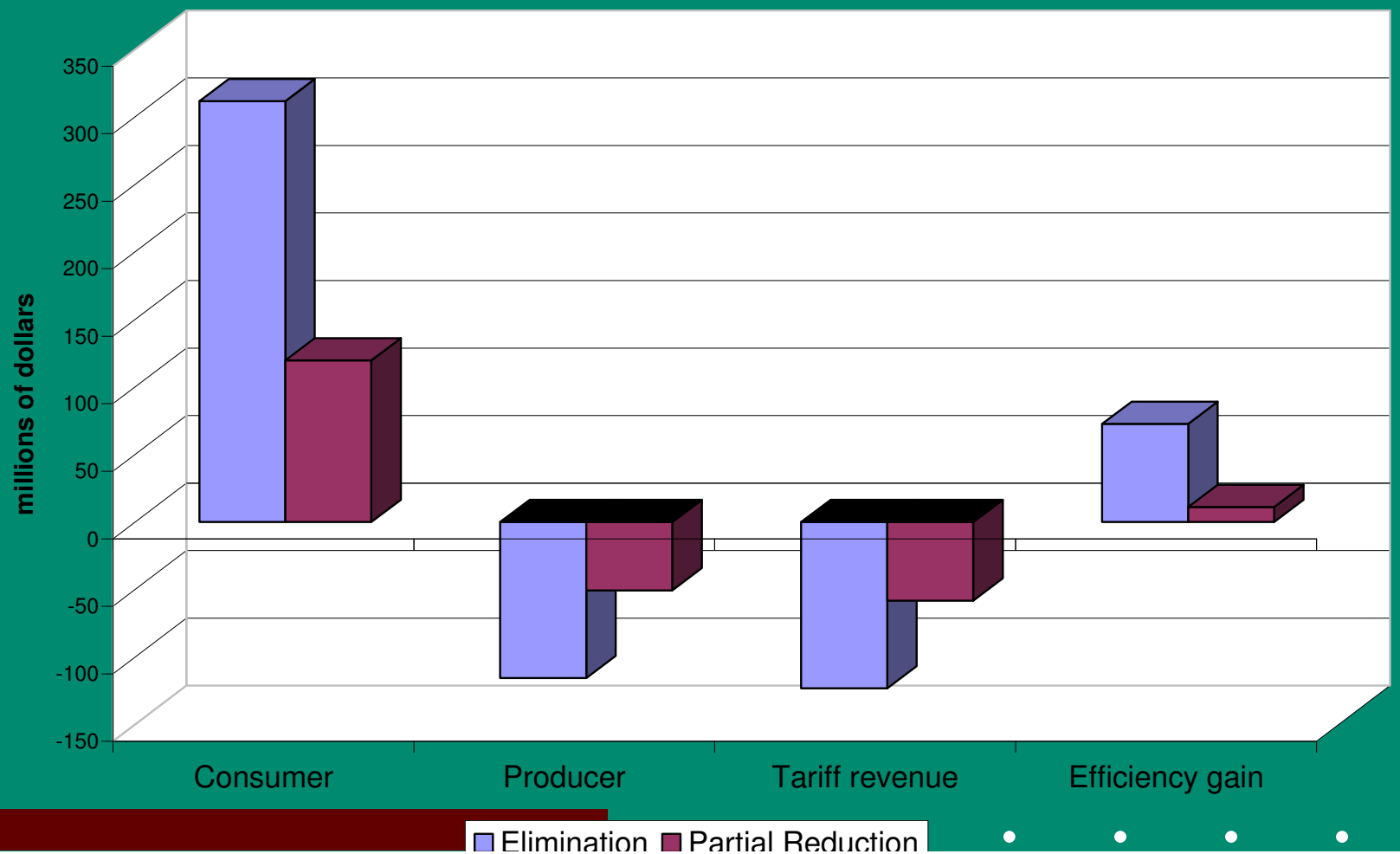
$$\varepsilon_{12} = -\frac{-S_2(\varepsilon_T + \varepsilon_{22})}{S_1}$$

$$\varepsilon_{22} = -\frac{-S_1(\varepsilon_T + \varepsilon_{11})}{S_2}$$

FCOJ protection in MERCOSUR and USA

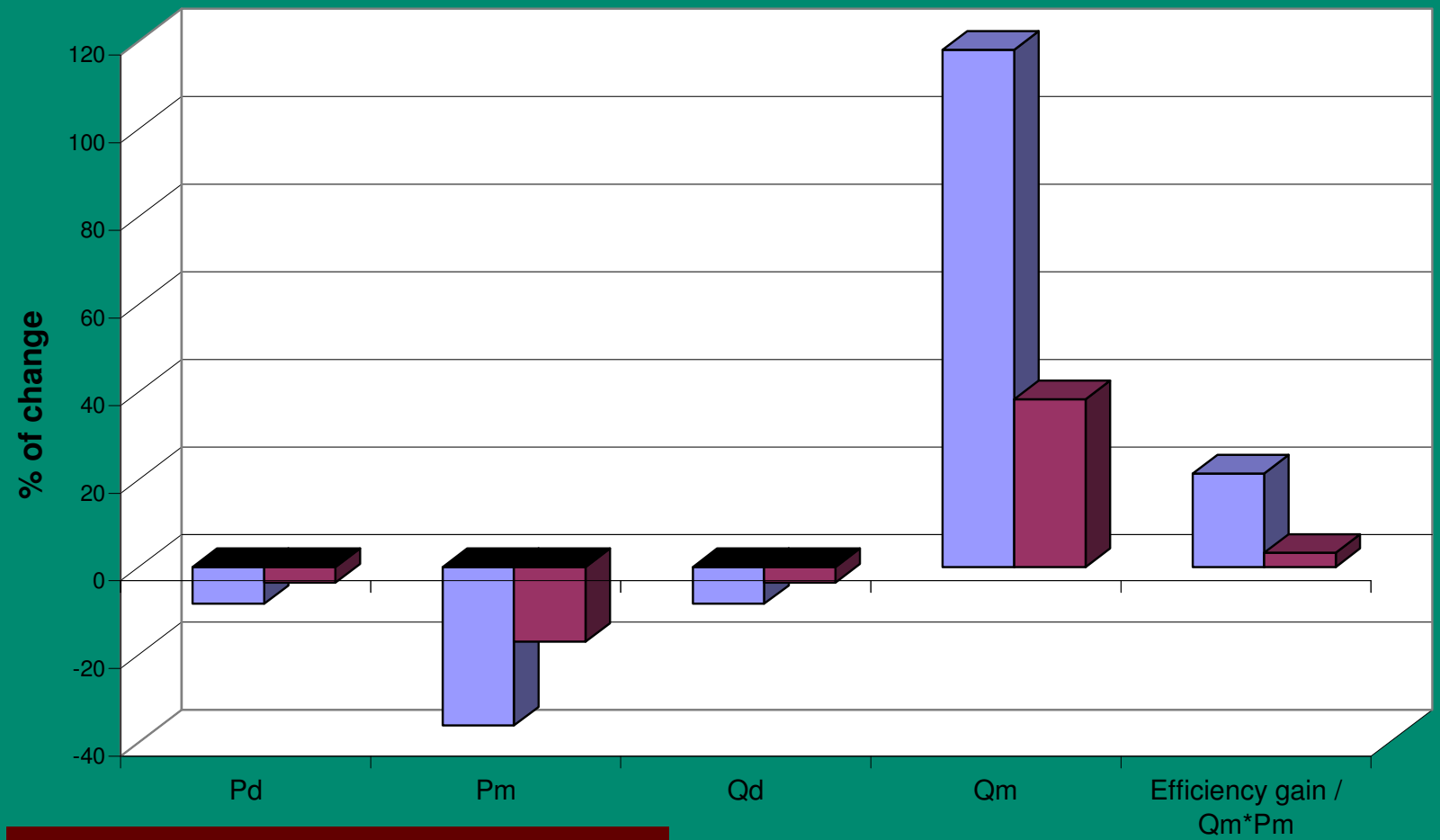
- MERCOSUR´s Common External Tariff (CET) for orange juice is currently 15%.
- In the European Union, the tariff applied to FCOJ imports originating from Brazil is around 35%.
- In the USA, FCOJ imported from Brazil faces barriers in the form of a per unit tax equivalent to a 56,7% *ad valorem* tax.
- The FCOJ imports from Mexico pay taxes equivalent to a 30,7% *ad valorem* tax.

Results - small country model



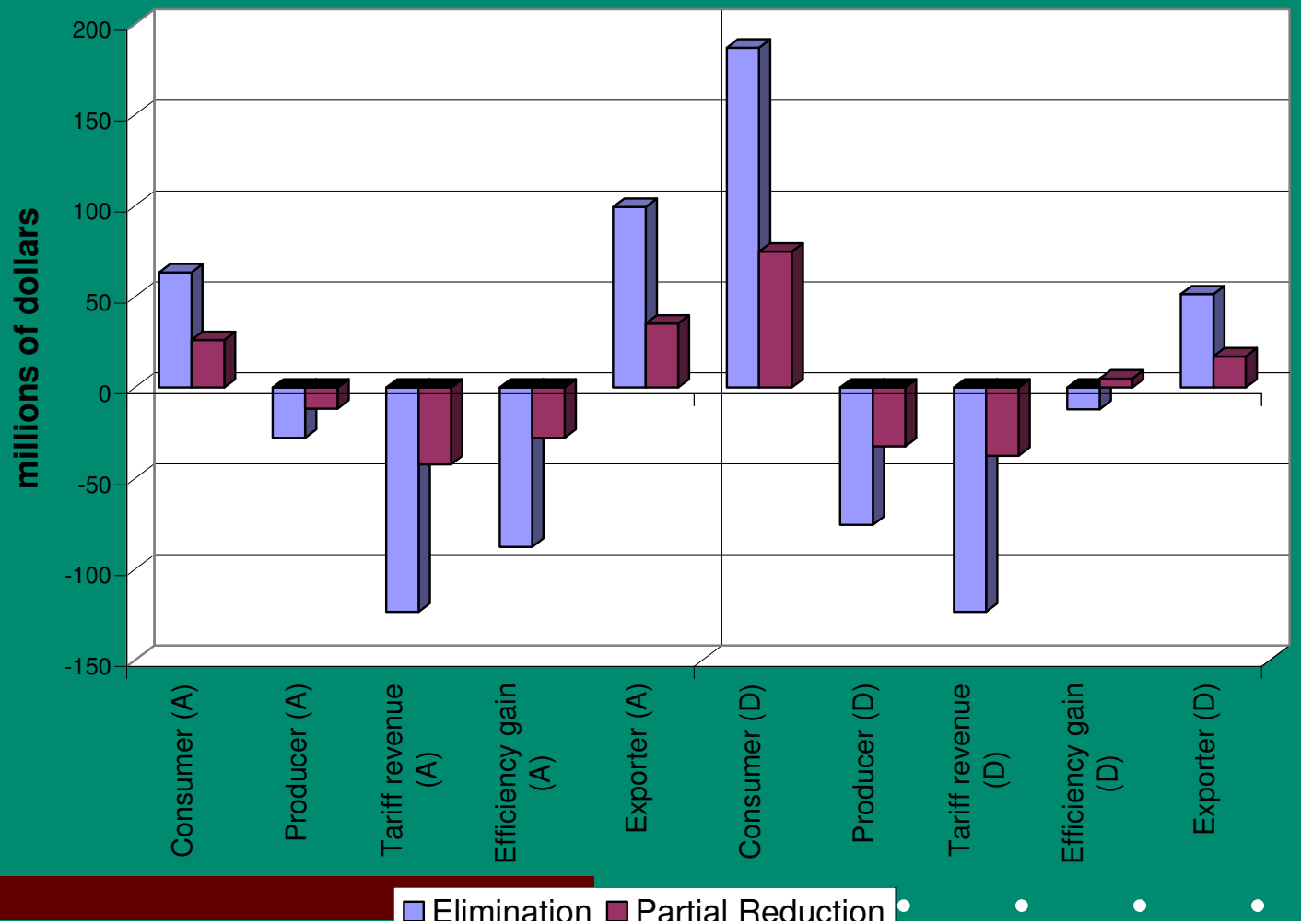
Results - small country model

Changes in prices and quantities in two scenarios



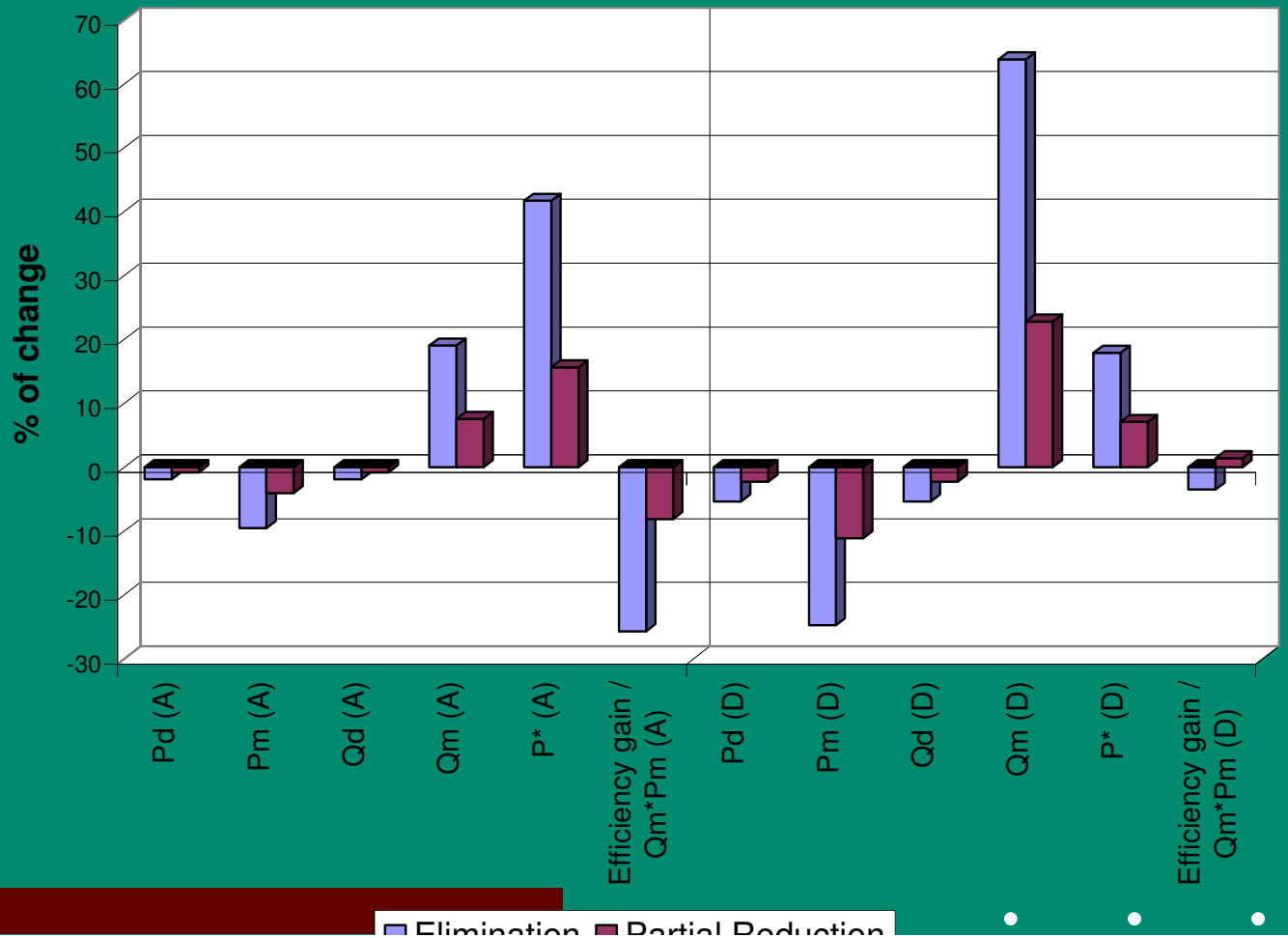
Results - large country model

Welfare effects in two scenarios



Results - large country model

Changes in prices and quantities in two scenarios



Conclusions

- The analysis suggests that strong resistance to trade liberalization is bound to arise in the US FCOJ market.
- In the more realistic case of large country model, the tariff reduction will produce losses of welfare in the local economy.
- Anticipating such resistance, Brazilian producers have been investing in the US market, building orange juice processing capacity to become large buyers of FCOJ, both domestically produced and imported.

Initial values

Table 12: Initial Prices and Quantities and Elasticities

Prices and elasticities	Values
Import price of FCOJ (dollars/ton – 1999-2000) *	1,350
Domestic price of FCOJ (dollars/ton – 1999-2000) *	1,350
Quantity of domestically produced good (ton – 1999-2000) *	1,064,102
Quantity of imports of FCOJ from Brazil (ton – 1999-2000) *	252,398
Price elasticity of domestic supply **	1.0
Price elasticity of total demand **	0.5
Own-price elasticity of demand of the domestically produced good ***	-0.8643
Own-price elasticity of demand of the imported good ***	-2.0357
Cross-price elasticity of demand of the domestically produced good in relation to imported good ***	0.3643
Cross-price elasticity of demand of the imported good in relation to domestically produced good ***	1.5358
Elasticity of substitution between the domestic and imported good **	2.4

Sources: * Neves and Marino (2002)
**.Hufbauer and Elliot (1994);
*** Authors´ calculation.

Results - small country model

Table 13: Scenario I - Complete Elimination of the Tariff of 56,7% in FCOJ Market

WELFARE EFFECTS	VALUES (IN MILLIONS OF DOLLARS)
Consumer surplus gain	311.70
Producer surplus loss	115.63
Tariff revenue loss	123.29
Efficiency gain	72.78
Efficiency gain / Sales of the imported good (%) *	21.36
Change in the price of the domestic good (%)	-8.40**
Change in the price of the imported good (%)	-36.18
Change in the quantity of domestic good (%)	-8.40**
Change in the quantity of imported good (%)	118.06

* Sales of the imported good are measured at the initial situation, before liberalization. This value is calculated multiplying the initial price of the imported good by the quantity of imports.

** The fact that the changes in the price and quantity of domestic good are equal is due to the an unitary value of price elasticity of domestic supply.

Results - small country model

Table 14: Scenario II - Partial Reduction of the Tariff in the FCOJ Market to the Level of 30%

WELFARE EFFECTS	VALUES (IN MILLIONS OF DOLLARS)
Consumer surplus gain	119.74
Producer surplus loss	50.56
Tariff revenue loss	58.06
Efficiency gain	11.12
Efficiency gain / Sales of the imported good (%) *	3.26
Change in the price of the domestic good (%)	-3.58**
Change in the price of the imported good (%)	-17.04
Change in the quantity of domestic good (%)	-3.58**
Change in the quantity of imported good (%)	38.30

* Sales of the imported good are measured at the initial situation, before liberalization. This value is calculated multiplying the initial price of the imported good by the quantity of imports.

** The fact that the changes in the price and quantity of domestic good are equal is due to the an unitary value of price elasticity of domestic supply.

Results - large country model

Table 15: Scenario I - Complete Elimination of the Tariff of 56,7% in FCOJ Market

WELFARE EFFECTS	VALUES (IN MILLIONS OF DOLLARS)			
	A	B	C	D
Consumer surplus gain	63.32	104.74	156.12	186.91
Producer surplus loss	27.65	44.64	64.42	75.59
Tariff revenue loss	123.29	123.29	123.29	123.29
Efficiency gain	-87.62	-63.19	-31.60	-11.97
Efficiency gain / Sales of the imported good (%) *	25.71	18.55	9.27	3.51
Welfare of the exporter	99.37	83.52	63.53	51.34
Change in the price of the domestic good (%)	-1.94	-3.16	-4.59	-5.41
Change in the price of the imported good (%)	-9.56	-15.14	-21.37	-24.76
Change in the quantity of domestic good (%)	-1.94	-3.16	-4.59	-5.41
Change in the quantity of imported good (%)	19.05	32.97	51.80	63.86
Change in the export price (%)	41.72	32.97	23.21	17.89

* Sales of the imported good are measured at the initial situation, before liberalization. This value is calculated multiplying the initial price of the imported good by the quantity of imports.

Results - large country model

Table 16: Scenario II - Partial Reduction of the Tariff in the FCOJ Market to the Level of 30%

WELFARE EFFECTS	VALUES (IN MILLIONS OF DOLLARS)			
	A	B	C	D
Consumer surplus gain	26.10	42.82	63.03	74.82
Producer surplus loss	11.63	18.91	27.53	32.46
Tariff revenue loss	42.21	40.61	38.66	37.51
Efficiency gain	-27.74	-16.70	-3.16	4.85
Efficiency gain / Sales of the imported good (%) *	8.14	4.90	0.93	1.42
Welfare of the exporter	35.21	29.08	21.58	17.17
Change in the price of the domestic good (%)	-0.81	-1.33	-1.94	-2.29
Change in the price of the imported good (%)	-4.09	-6.60	-9.52	-11.16
Change in the quantity of domestic good (%)	-0.81	-1.33	-1.94	-2.29
Change in the quantity of imported good (%)	7.52	12.58	18.96	22.80
Change in the export price (%)	15.61	12.58	9.07	7.09

* Sales of the imported good are measured at the initial situation, before liberalization. This value is calculated multiplying the initial price of the imported good by the quantity of imports.