Evaluating the Impact of Transport Costs in Latin America

Julio A. Guzman and Masakazu Watanuki

Inter-American Development Bank

III Regional Meeting on Computable General Equilibrium (CGE) Modeling

Buenos Aires, Argentina, September 2-3, 2010

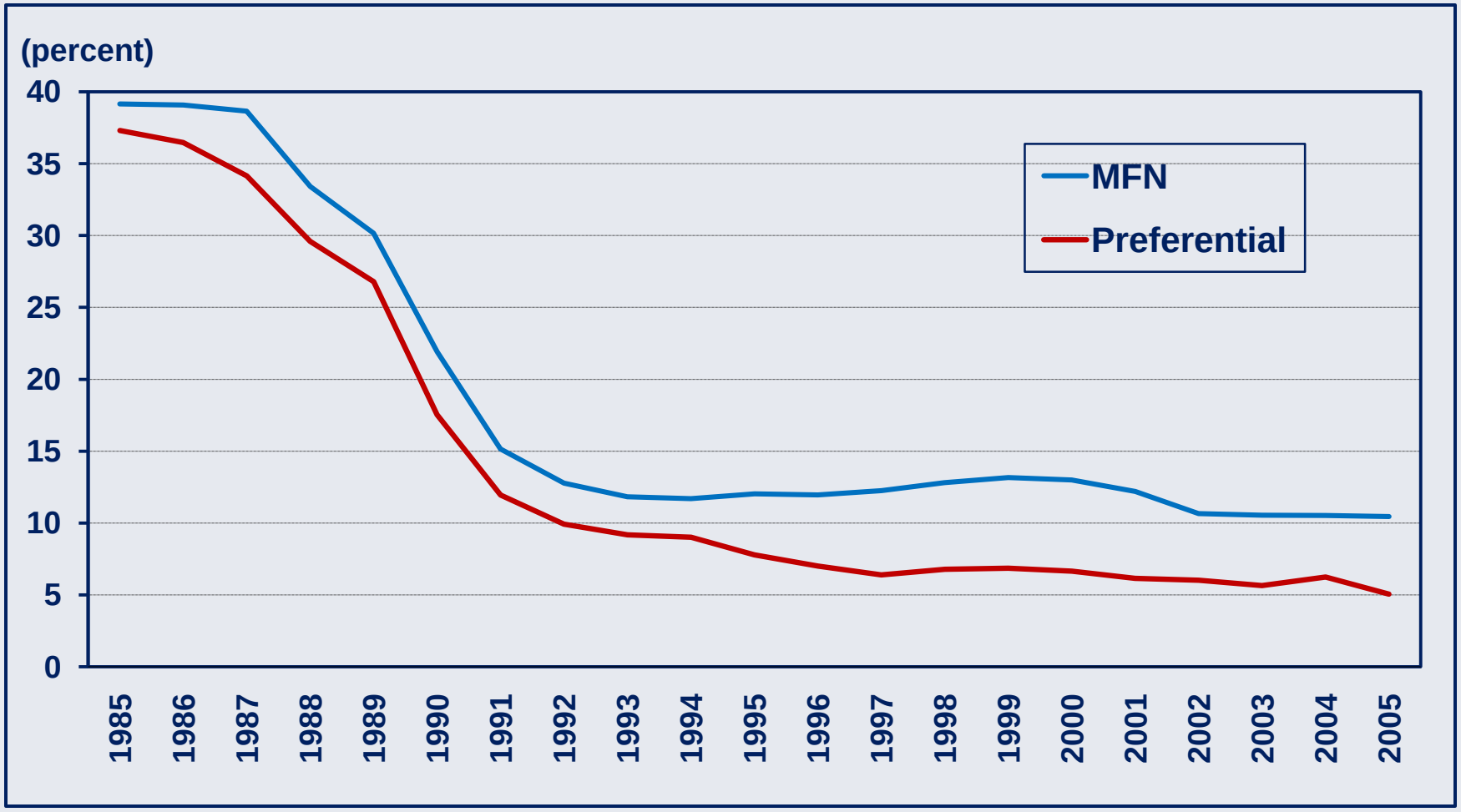
Outline of the Presentation

1. Background and Policy Issues
2. Trade Transport Costs in Latin America
3. IDB-INT CGE Model and Benchmark Data
4. Policy Simulations
5. Conclusion and Policy Implications

Background and Policy Issues

- **Over more than two decades, barriers to trade (tariffs) in market access have sharply declined, as Latin America has actively engaged in trade liberalization via multilateral, regional and unilateral approaches:**
  - **MFN tariffs at 10 %**
  - **Preferential tariffs at 5%**
- **In the region, trade continues to be a driver for growth and development:**
  - **Exports: 22 % of GDP (43 % for CHL, 36% for VEN)**
  - **Trade balance: $64.6 billion**
- **Despite tariffs have come down, the region faces a new challenge of high transport costs, which used to be less visible and unrecognized until very recently.**

Average MFN & Preferential Tariffs in Latin America (1989–2005)



Source: Estevadeordal, Volpe and Ando (2009).

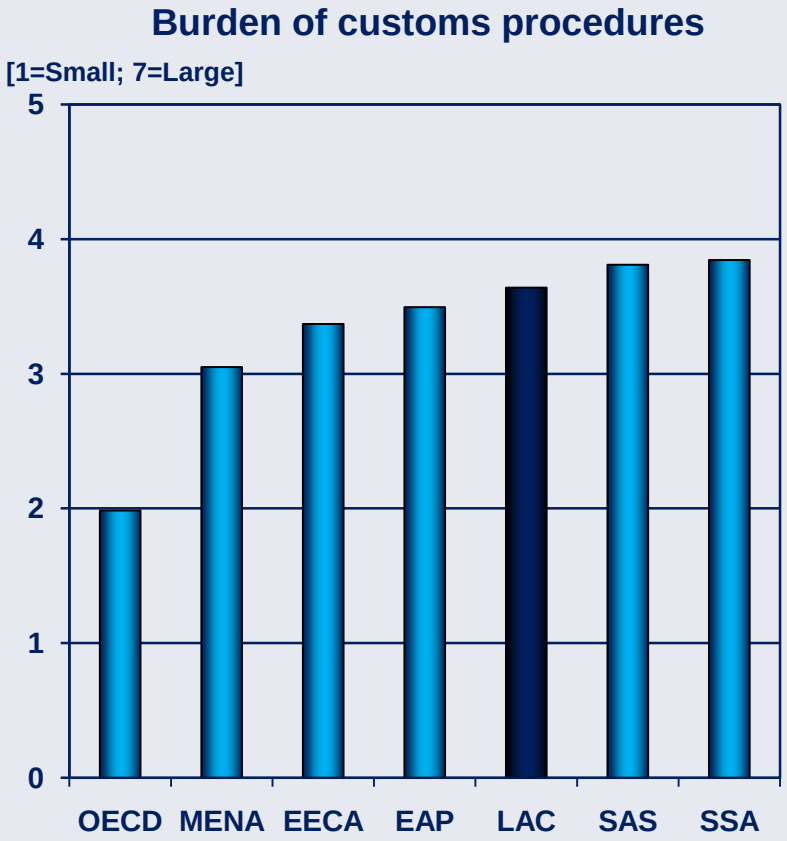
Trade Transport Costs in Latin America

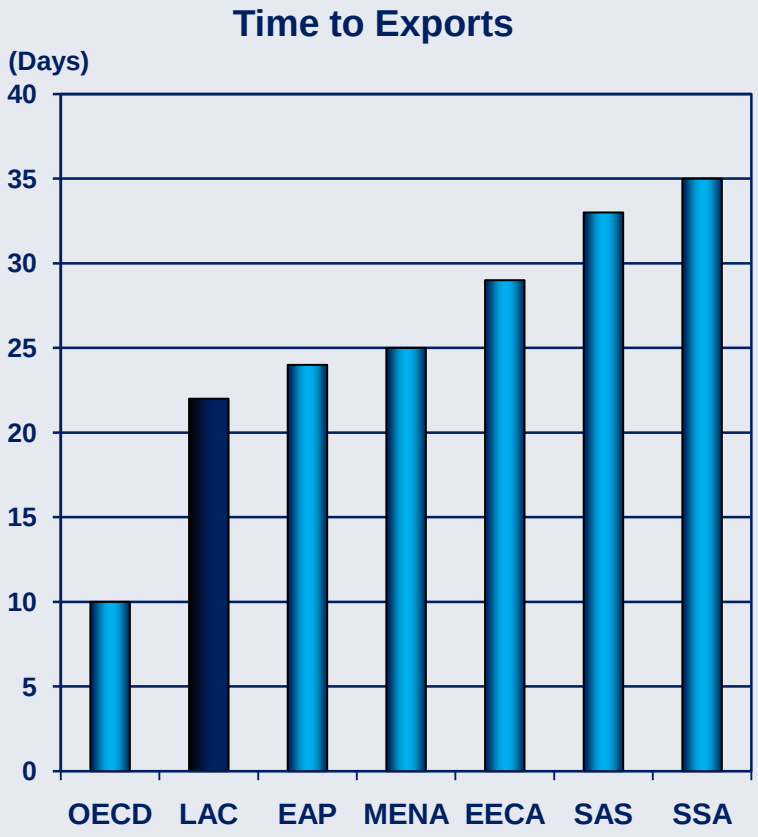
Trade Transport Costs in Latin America

Where is Latin America positioned in the world, in terms of transport costs?

- Recent global indicators, with a few exceptions, suggest that the region lags behind advanced countries as well as developing regions with the similar development stage.
- High transport costs hinder trade significantly, and more importantly reduce the region's global competitiveness in grave magnitude.
- This is a tremendous challenge for the region to compete with China, India and other emerging Asian countries in a global market.

Global Comparison of Trade-related Costs

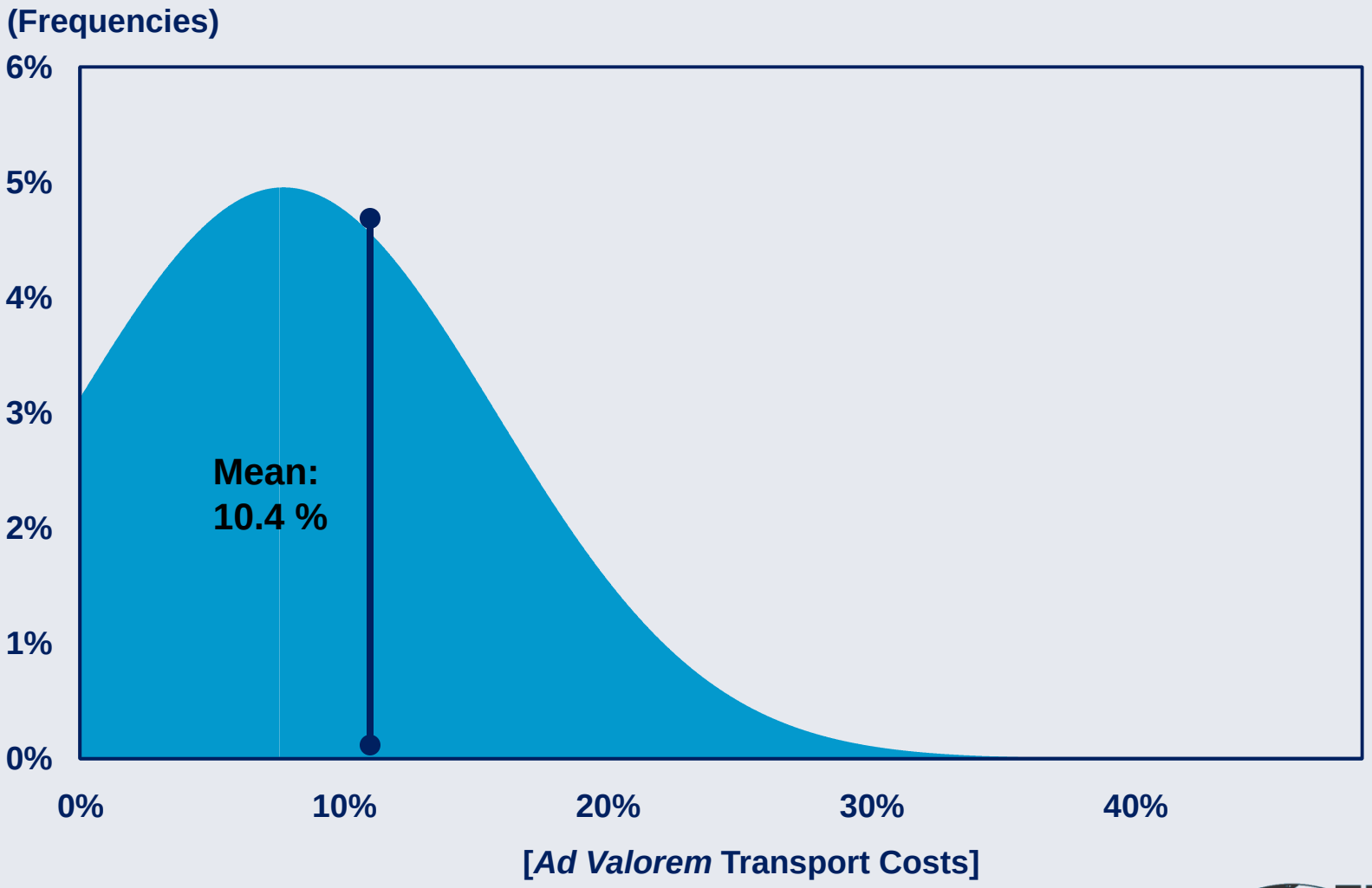




Legend: MENA: Middle East/ North Africa EECA: Eastern Europe/ Central Asia
EAP: East Asia/ Pacific LAC: Latin America/Caribbean
SAS: South Asia SSA: Sub-Sahara Africa

Source: World Economic Forum (2008) and World Bank (2008).

Distribution of transports in Latin America



Source: Moreira, Volpe and Blyde (2008).

Bilateral Trade-related Costs in Latin America

(*Ad Valorem* rates, percent)

		Destination										
		MEX	BOL	COL	ECU	PER	VEN	ARG	BRA	PRY	URY	CHL
Origin	MEX		10.58	8.91	9.00	8.63	9.00	10.87	11.74	13.69	9.05	8.18
	BOL	10.58		18.15	9.54	8.92	13.68	8.44	8.09	16.96	9.40	11.45
	COL	8.91	10.14		7.17	11.27	6.97	11.84	10.98	14.34	8.38	8.83
	ECU	8.73	9.54	7.17		7.33	7.54	14.53	11.41	14.26	13.39	12.27
	PER	8.63	8.74	9.60	7.33		9.95	10.23	8.61	13.91	12.07	7.34
	VEN	8.73	13.68	6.97	7.33	9.95		11.48	12.05	13.69	6.74	10.02
	ARG	10.87	7.87	16.47	14.53	15.23	11.48		6.69	6.66	5.37	10.72
	BRA	11.74	7.27	11.56	11.41	12.85	12.05	8.66		6.19	8.12	10.77
	PRY	13.69	8.60	18.15	14.26	15.65	13.69	5.48	4.82		12.11	12.82
	URY	9.05	9.79	12.69	13.39	16.18	6.74	7.08	5.13	9.43		11.90
	CHL	8.18	8.46	15.59	12.27	10.24	10.02	9.04	10.46	9.31	7.63	
Aggregate		10.09	9.18	12.06	10.59	11.60	10.03	9.42	8.71	10.41	8.87	10.35

Source: Moreira, Volpe and Blyde (2008).

Comparison of Transport Costs by Geographic Division in Latin America

(*Ad Valorem* rates, percent)

		Destination	
		Pacific Region	Atlantic Ocean
Origin	Pacific Region	9.70	11.28
	Atlantic Ocean	13.66	7.14

Pacific region: Colombia, Ecuador, Peru and Chile,
Atlantic coast: Argentina, Brazil, Paraguay and Uruguay.

Source: Moreira, Volpe and Blyde (2008).

IDB-INT CGE Model and Benchmark Data

IDB-INT Model Dimensions

- **Model type:** global, multi-region, static
- **20 countries and regions**:
  - 11 countries in Latin America
  - 9 intra- and extra- hemispheric partners
- **Sectors:**
  - 4 agriculture
  - 2 energy
  - 3 Food Industries
  - 4 light manufactures
  - 4 heavy manufactures
  - 2 Utilities and construction
  - 3 Services
- **Factors:** 2 labor, capital, land and natural resources
- **Base Year:** 2008

Some Features of the Modeling: Database

The model incorporates several features, distinguishing our work from other studies on this topic.

- Based on the recent econometric study by Moreira, Volpe and Blyde (2008) on measuring the impact on transport costs for Latin America, the model is fully built on the following two critical datasets:
  - Trade transport costs on a bilateral basis at HS 8 or over
  - Elasticity of substitution on trade, based on the pooled trade flows.

Evaluating Transport Costs

On modeling front, the model follows the concept of "effective price and quantity", introduced by Hertel, Walmsley and Itakura (2001), and further elaborated by Minor and Tsigas (2008).

Effective domestic price of imports:

$$PM_r^* = PM_r / \chi_r$$

Effective quantity of imports:

$$M_r^* = \chi_r \cdot M_r$$

Then the linearized forms of the quantity of import demand and the price of aggregate imports are expressed as follows:

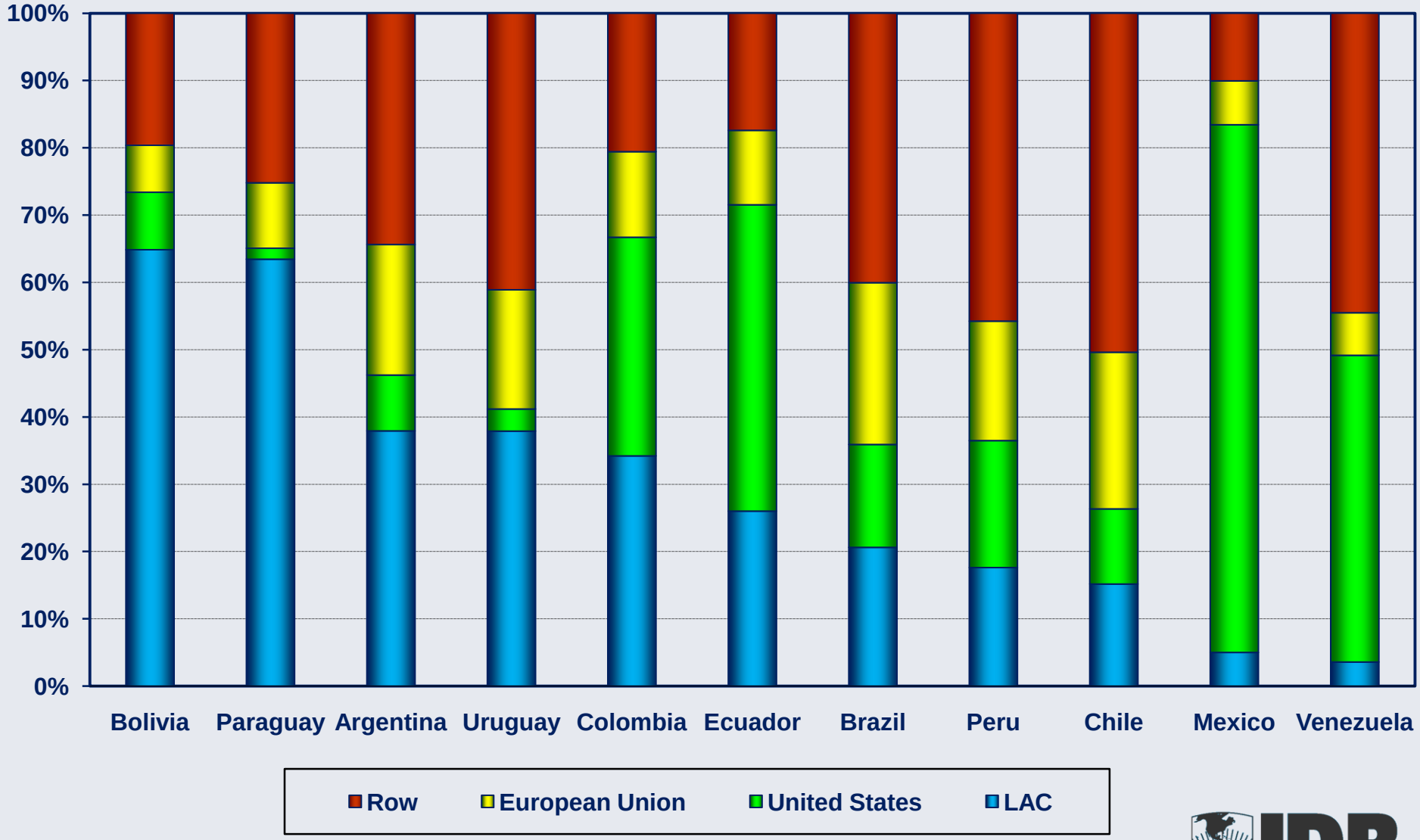
Quantity of import demand:

$$\hat{M}_r = -\hat{\chi}_r + X\hat{M} - \sigma \cdot \left(P\hat{M}_r - P\hat{X}M - \hat{\chi}_r \right)$$

Price of aggregate imports:

$$P\hat{X}M = \sum_r \theta_r \cdot \left(P\hat{M}_r - \hat{\chi}_r \right)$$

Exports by Major Destination (2008)



Source: COMTRADE.

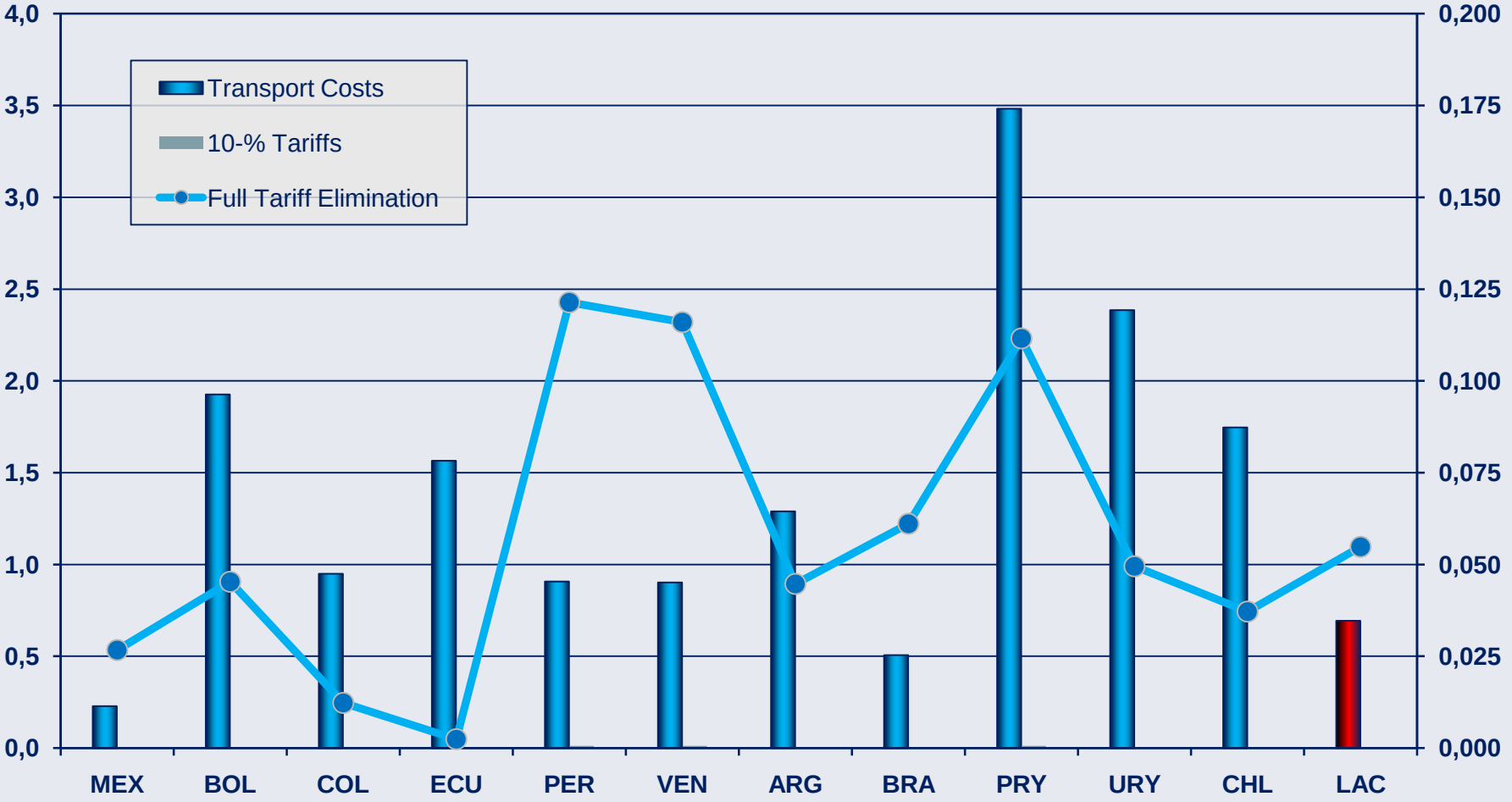
Policy Simulations

Transport Costs Policy Scenarios

Scenario	Policy variable	Description	Magnitude
EXP 1	Transport cost	Reduction of *ad valrem* transport costs among 11 countries in Latin America	10 % reduction
EXP 2	Tariff	Reduction of *applied tariffs* among 11 countries in Latin America	10 % reduction
EXP 3	Tariff	Complete elimination of *applied tariffs* among 11 countries in Latin America	100 % reduction

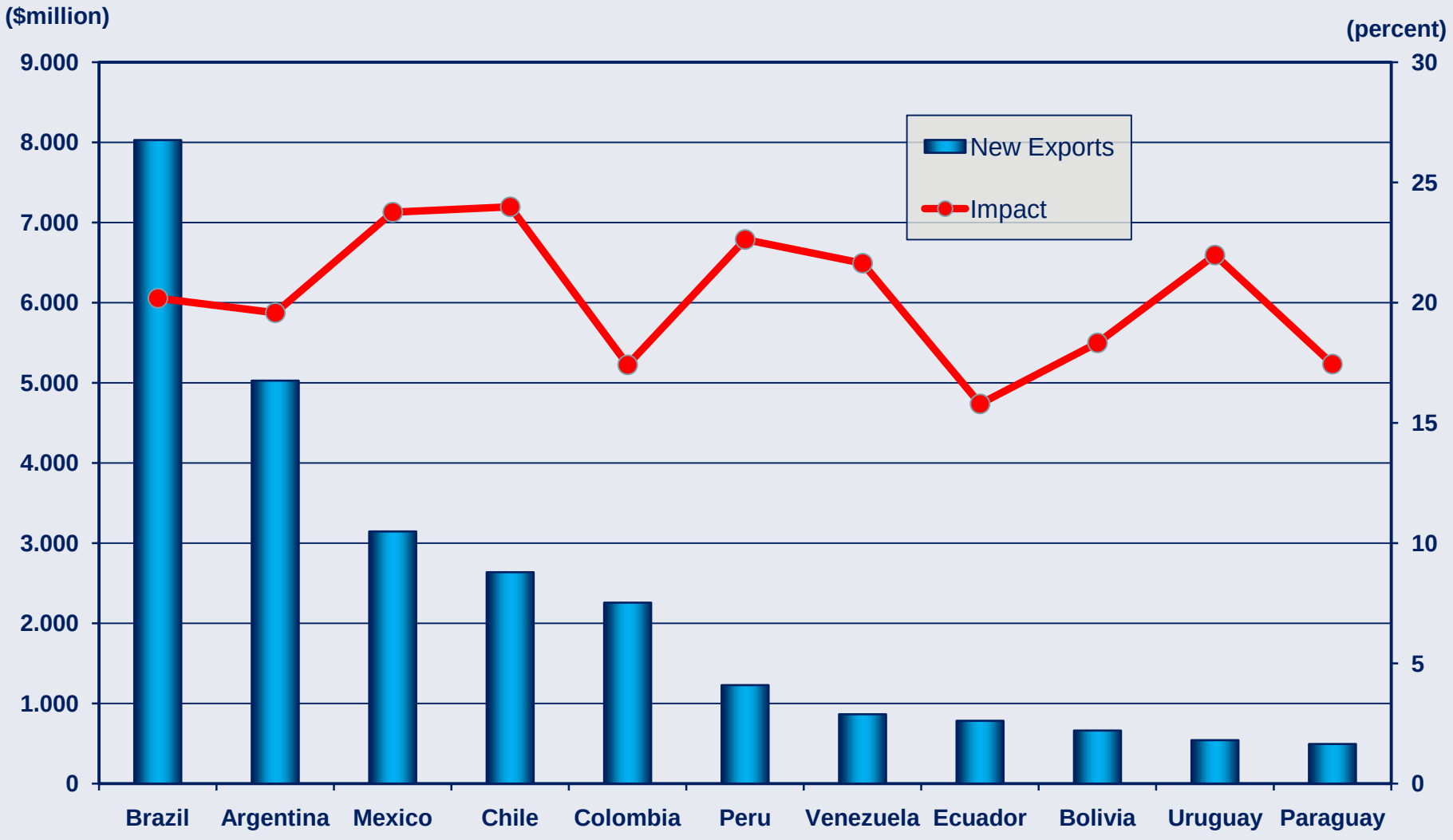
Impact on Macro Variable: Real GDP

(percentage change from base)



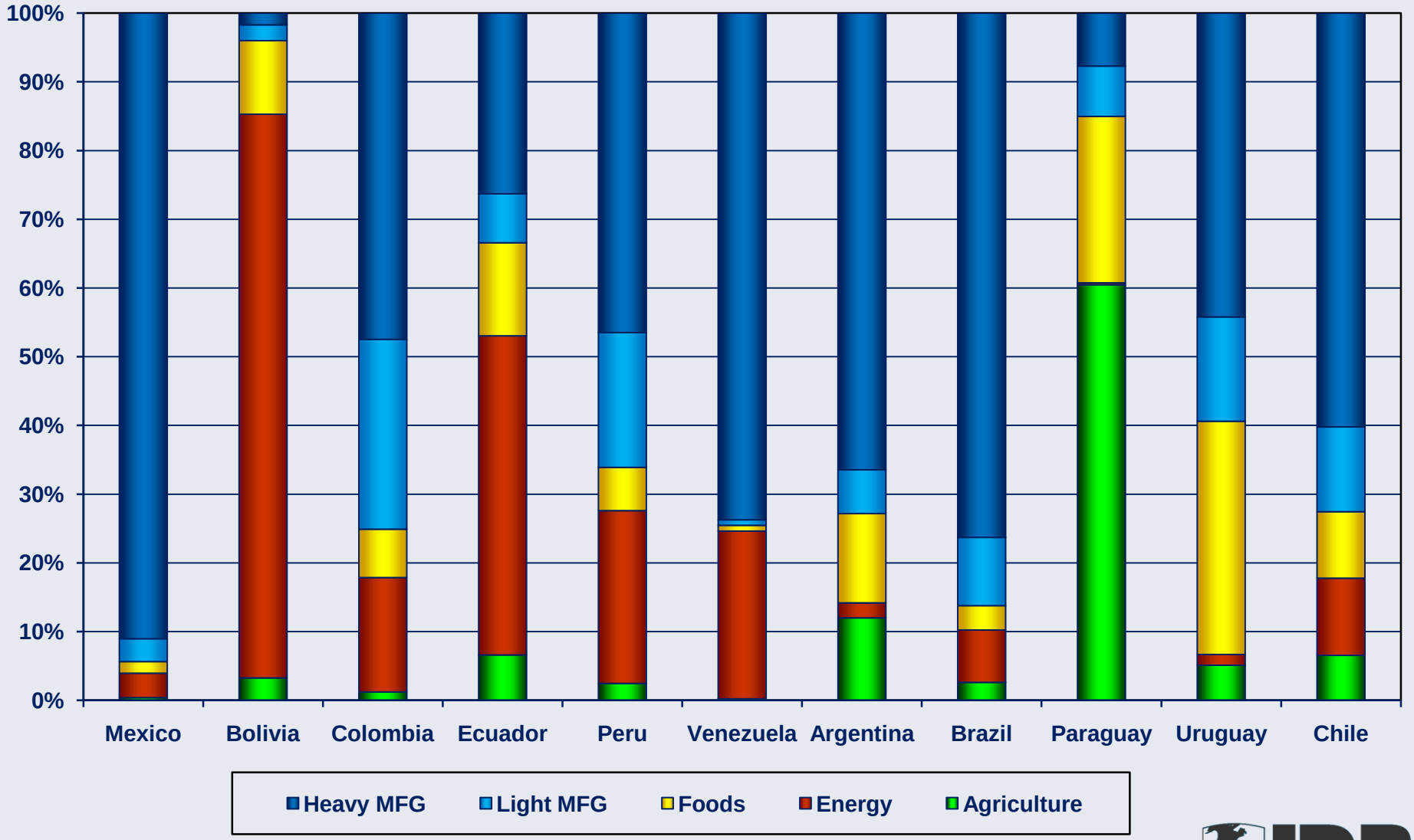
Source: Authors' CGE model estimates.

Impact on Intra-regional Exports



Source: Authors' CGE model estimates.

Composition of New Intra-regional Exports



Source: Authors' CGE model estimates.

Conclusion and Policy Implications

Conclusion

- The region's average transport costs stand at around 10 %, which is more than twice as high as its average tariffs (4.3 %), constituting much larger barriers to trade.

- A 10-percent reduction of *ad valorem* transport costs in Latin America increases the region's real GDP by 0.7 percent, with all winners. The intra-regional exports expand by more than 20 percent, with high a heterogeneity in the composition.

- The positive impact of reduction of transport costs in Latin America far exceeds the effects generated from tariff reduction with the same magnitude.

Policy Implications

- The region's trade agenda should focus on the topic of transport costs with higher priority. A reduction of transport costs (or an improvement of transport infrastructure) would have huge potentials of increasing trade, welfare and global competitiveness.
- The focus on the improvement of transport infrastructure would vary country by country, but should be well designed to focus on key transport modes based on (i) composition of trade; and (ii) main partners. Marine transport would be the key for most countries, but road network would be also important, particularly on trade crossing the Andean mountain range.