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Regional trade, Transport Costs and Logistics: A view from Latin America

By

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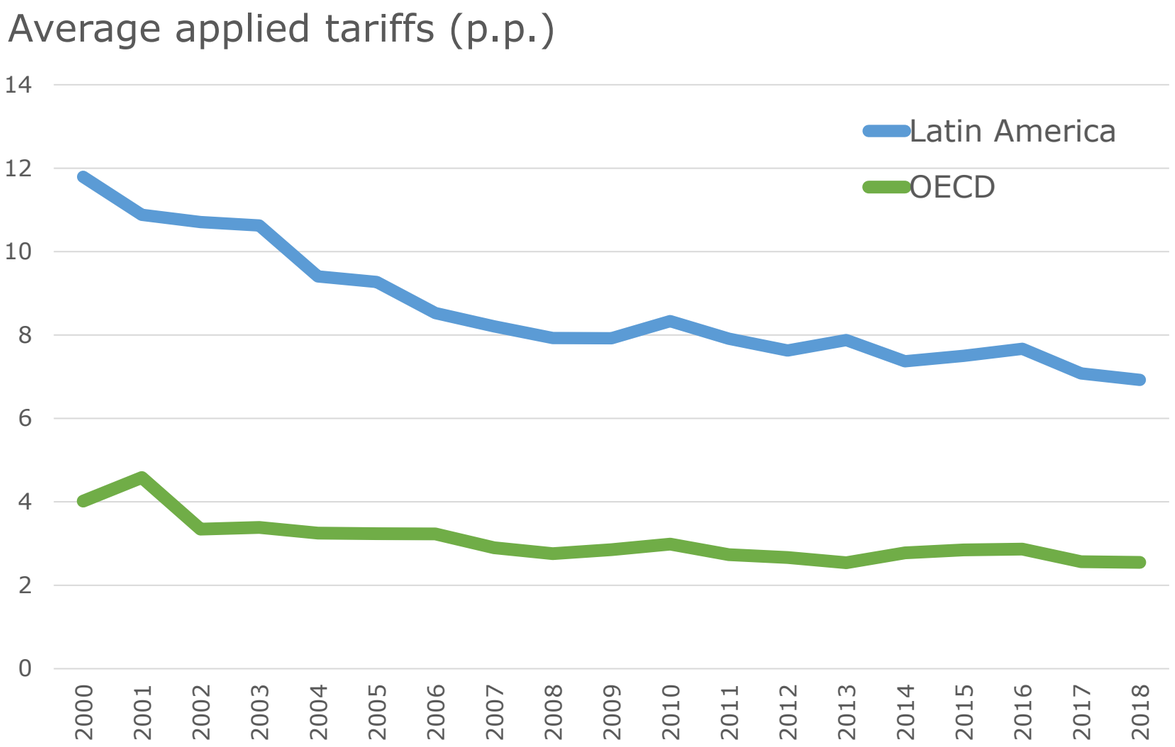
Regional trade, Transport Costs and Logistics: A view from Latin America*

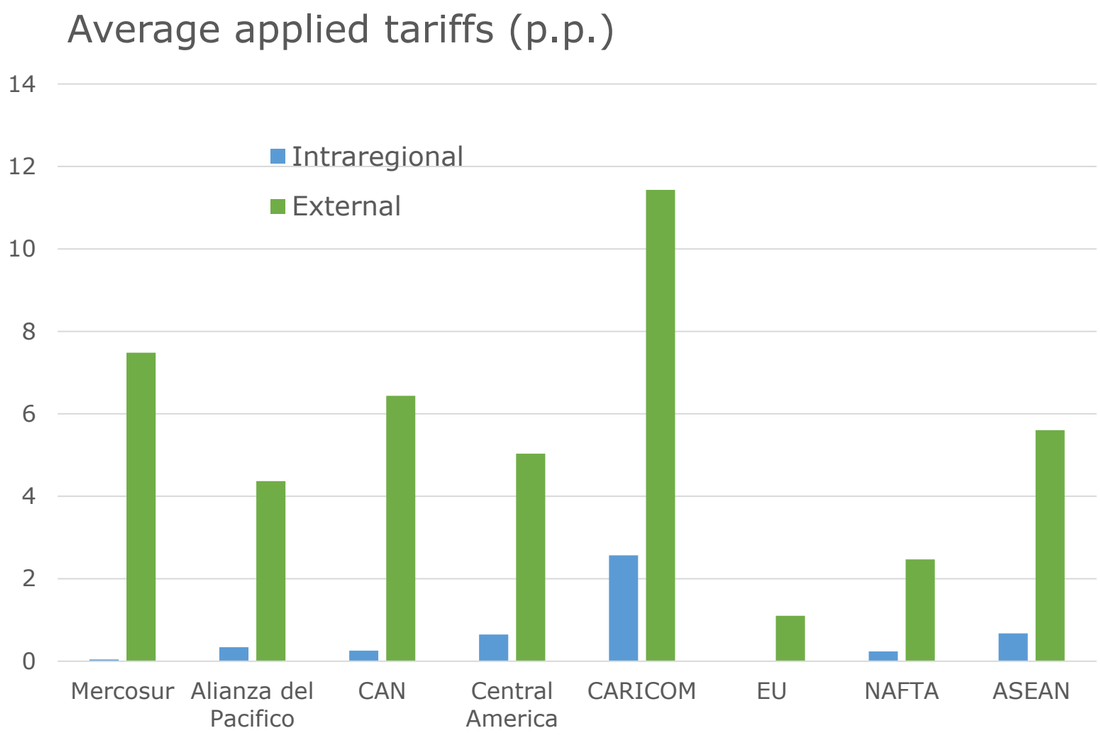
UNCTAD Workshop
24 and 25 November 2021

*Based on RED 2021: Pathways to Integration
Trade Facilitation, Infrastructure and Global Value Chains

Context (I)

Most Latin American countries have implemented trade openness policies in the last 30 years

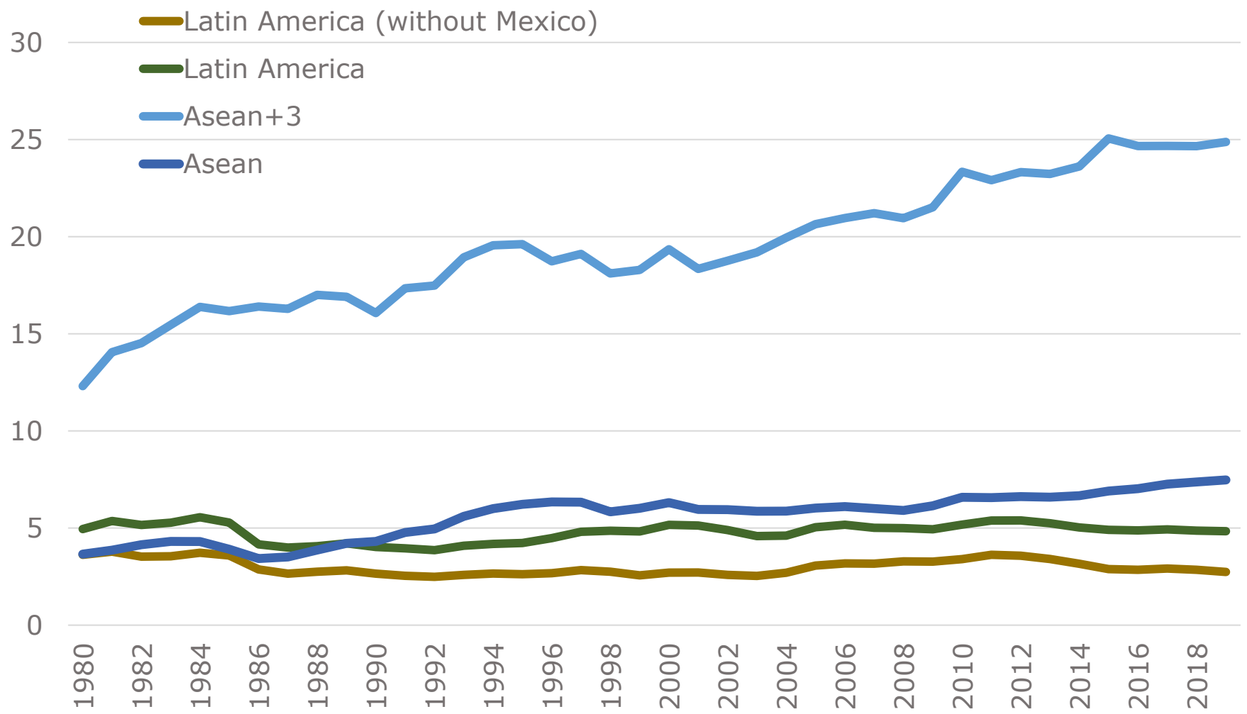




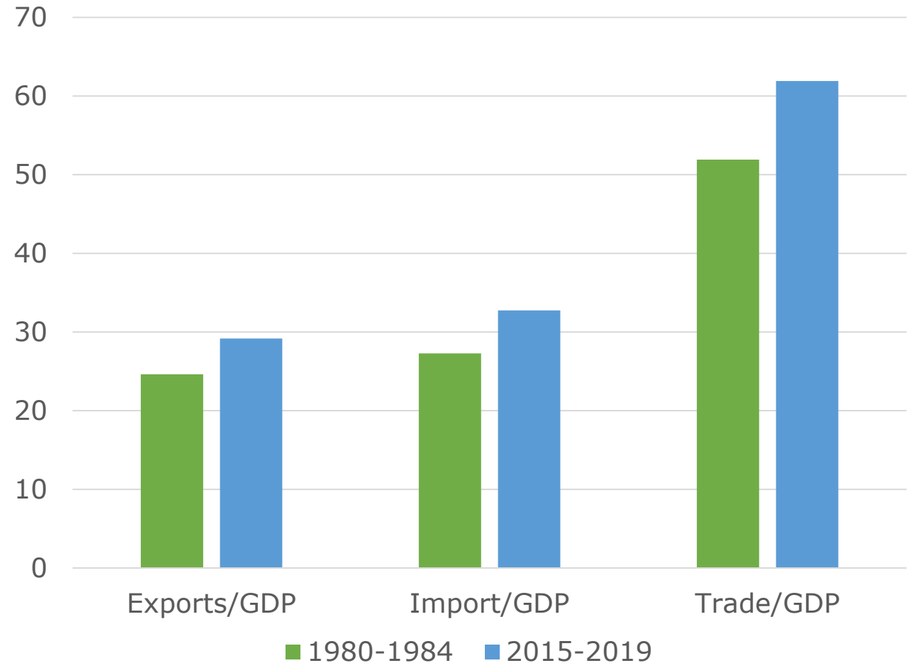
Context (II)

…however, with moderate increases in exports/GDP and no increases in the participation in global trade.

Participation in global exports (%)



Exports & imports (% GDP)

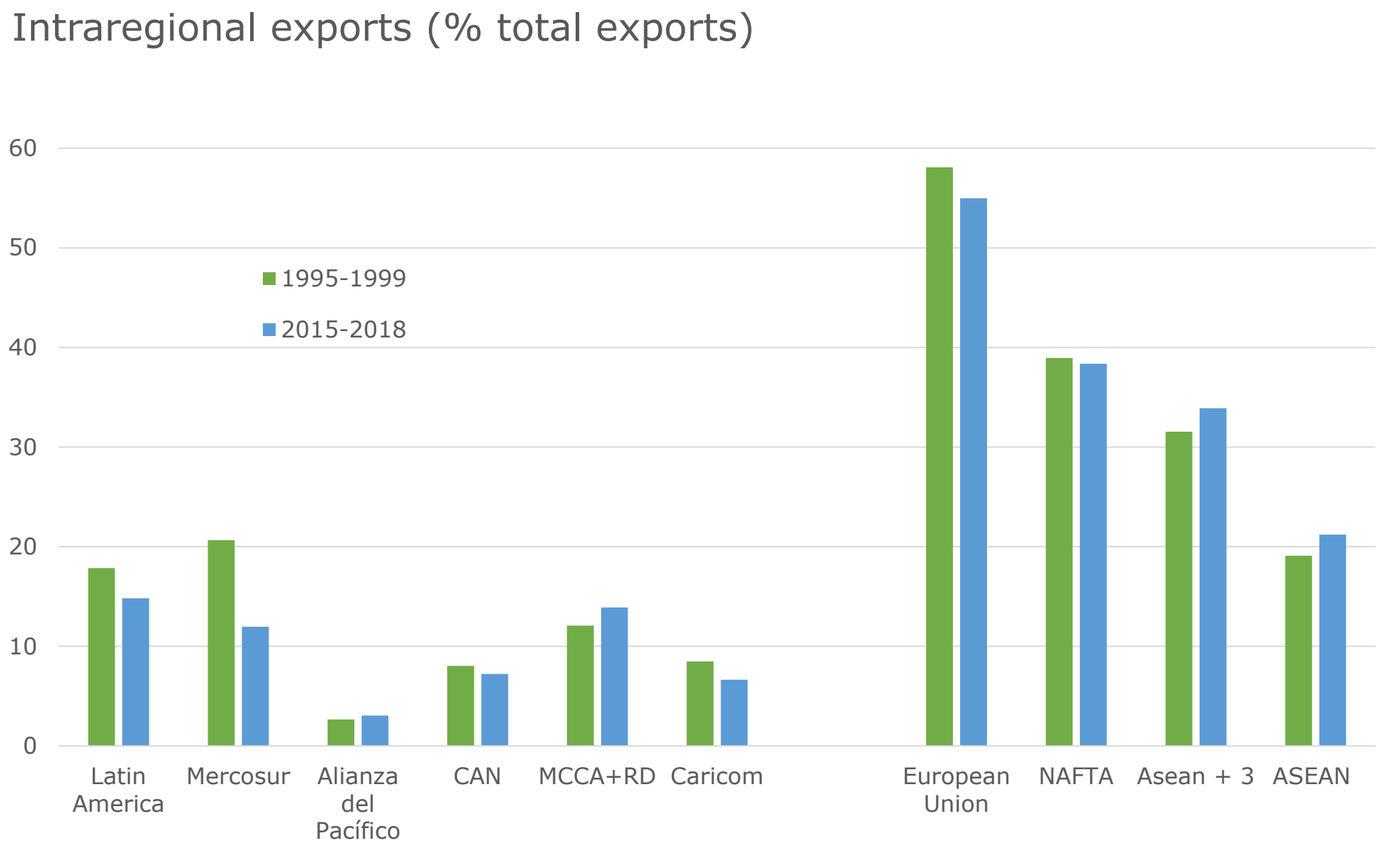


Context (III)

Many free trade agreements have been established within the region (85% of trade is under 0 tariffs)

Context (IV)

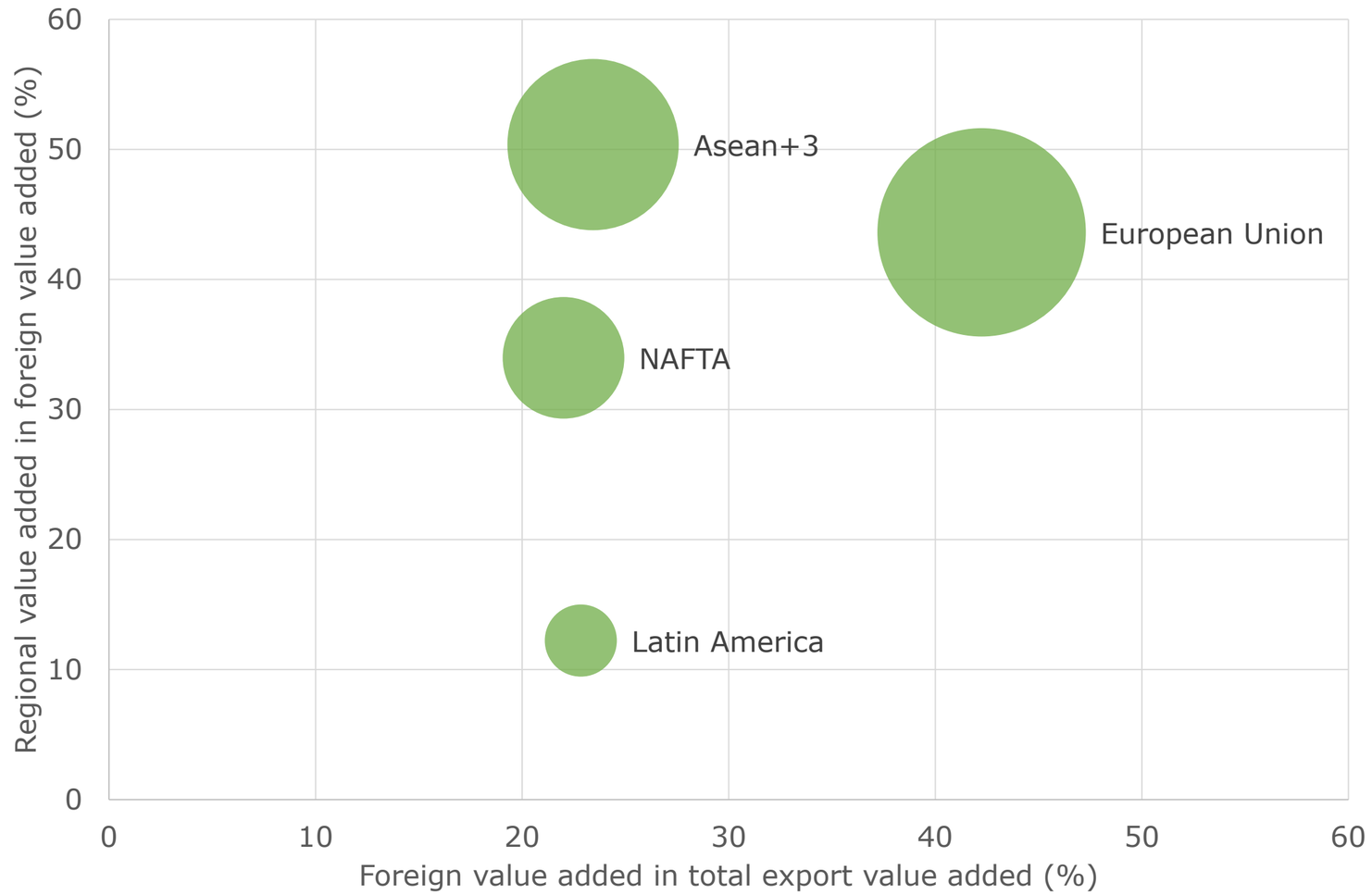
Despite this tariff reduction intraregional trade is low which explains the stagnated behavior of global exports



- Only MCCA+RD increased intrarregional trade in the last 20 years in Latin America
- Benchmark regions present levels much higher of intrarregional exports

Context (V)

One key driver of intraregional trade is participation in GVC



- "Backward-type" measures of GVC show that these production chains have a strong regional feature
- The three "world hubs" are characterized by high foreign VA in exported VA and high regional VA in foreign VA
- Latin America has low foreign VA in exported VA and low regional VA in foreign VA

Context (V)

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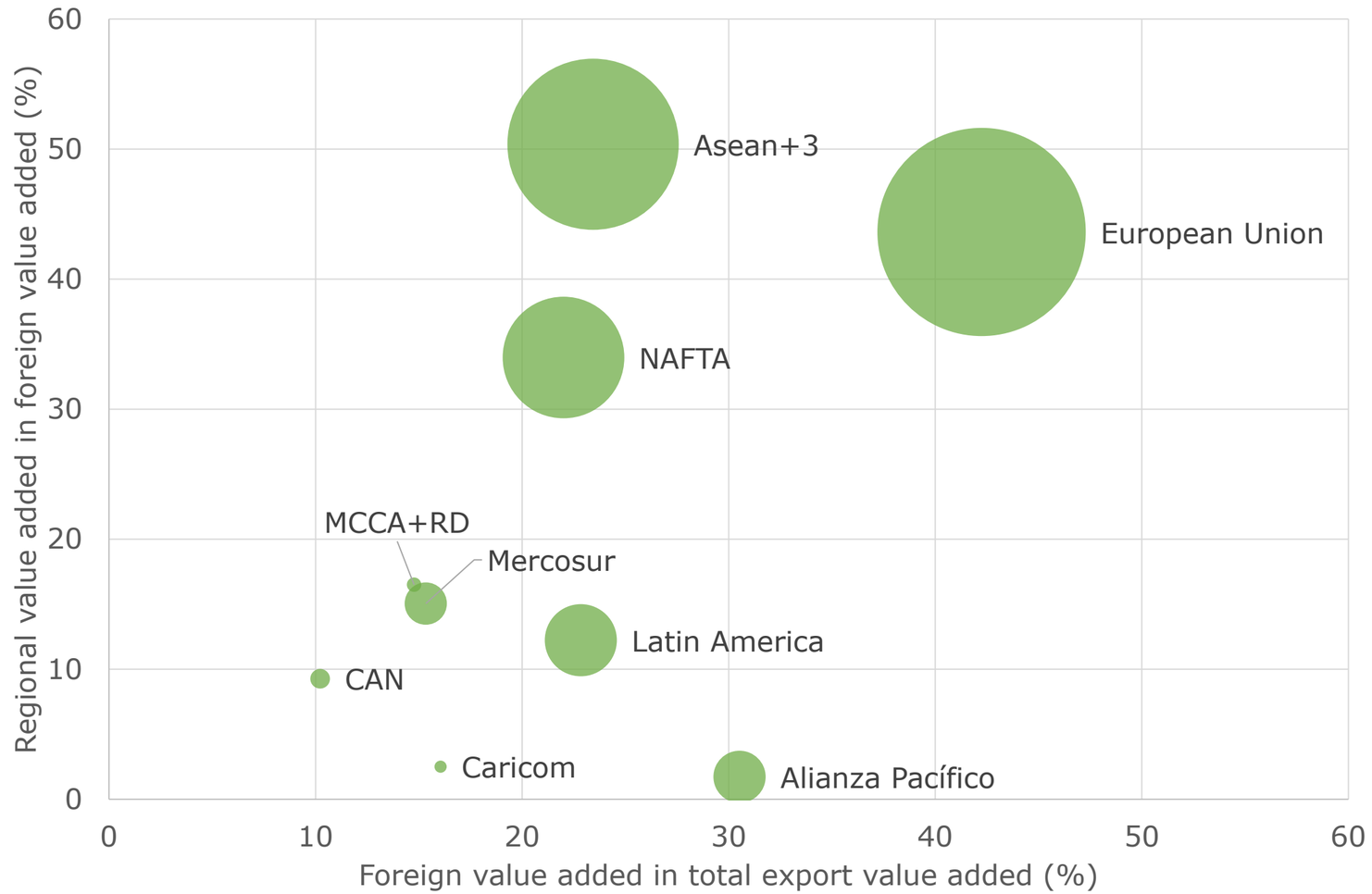

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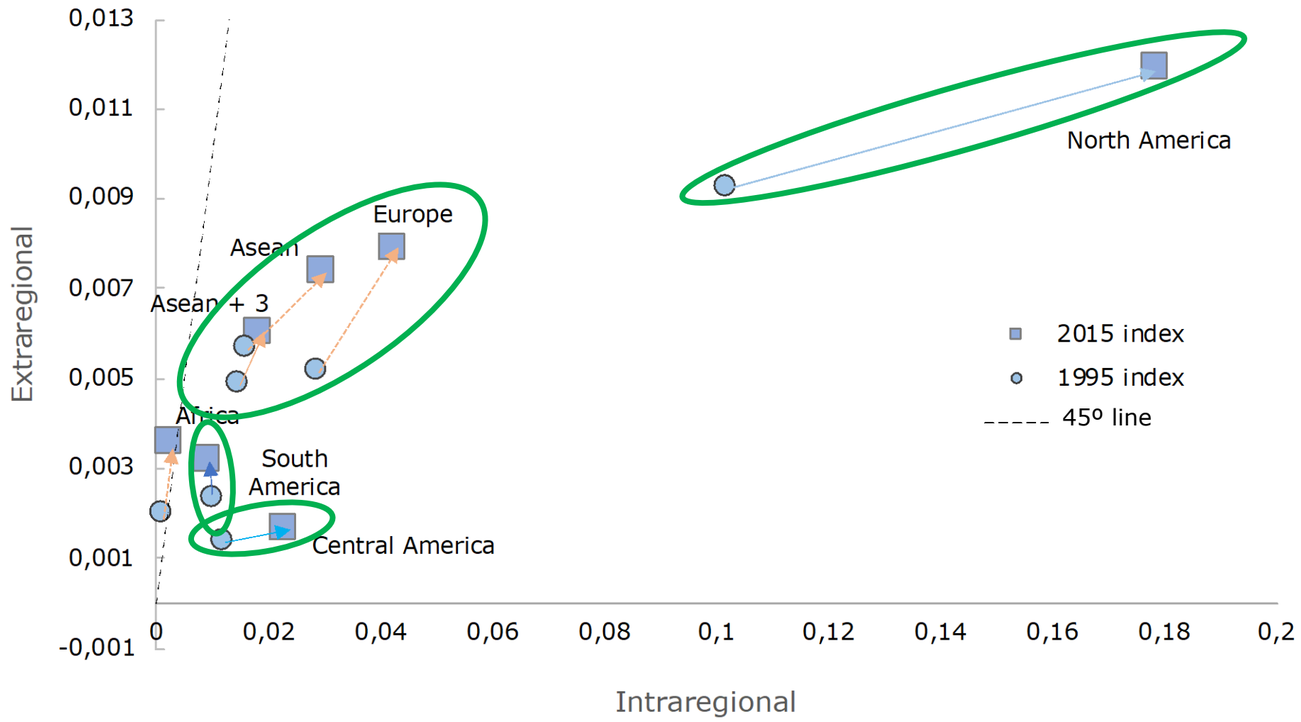
- The three "world hubs" are characterized by high foreign VA in exported VA and high regional VA in foreign VA
- Latin America has low foreign VA in exported VA and low regional VA in foreign VA
- Particularly low intraregional integration in Caricom, AP & CAN

Context (VI)

Low intraregional trade seems to be associated with higher trade cost as captured by proximity measures

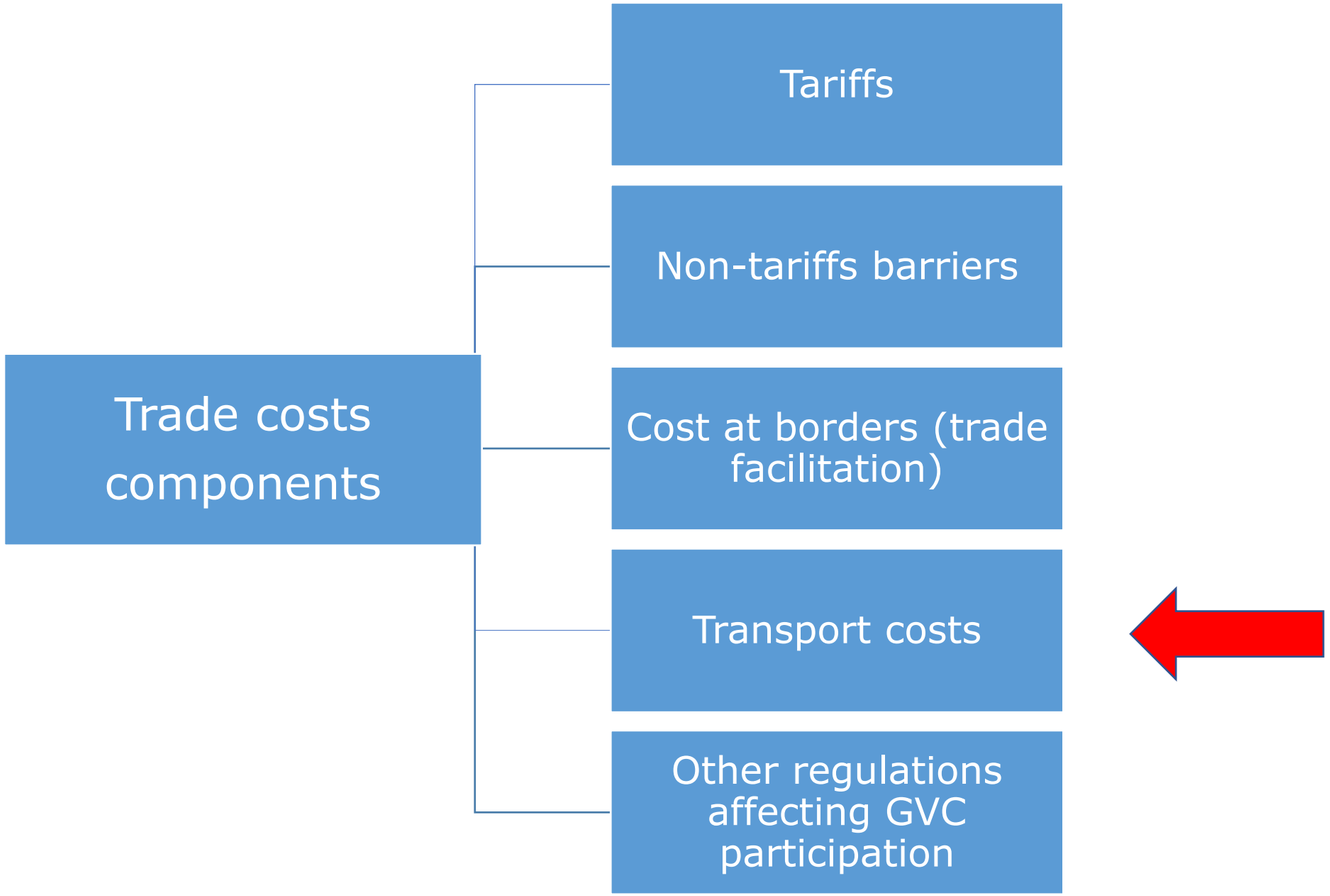
Proximity indicator (calculated as the ratio between bilateral and domestic trade) is associated with the inverse of bilateral trade costs (Novy, 2013):

$$\left(\frac{X_{ij}X_{ji}}{X_{ii}X_{jj}}\right)^{\frac{1}{2}} = \left(\frac{t_{ij}t_{ji}}{t_{ii}t_{jj}}\right)^{-\left(\frac{1}{2}(\sigma-1)\right)}$$



- EU, North America & ASEAN increased their intra and extraproximity, with a biased towards the interior of the region.
- Central America → similar pattern but in a smaller magnitude.
- South America → increased extraregional proximity with a drop in intraregional proximity

What can we do to promote integration?



Measuring the impact of trade costs: preferential and MFN liberalization

We estimate a Structural Gravity Trade Model (including domestic trade)

$$x_{ijt}^{S} = \exp\left(\begin{array}{c} \psi_{it}^{S} + n_{jt}^{S} + \mu_{ij}^{S} \\ + \beta_1^{S} ALC_{ijt} \times \ln(1+MP_{ijt}) \\ + \beta_2^{S} \ln(1+NMF_{ijt}^{S}) \\ + \beta_3^{S} ALC_{ijt} \times NALC_{jt} \\ + \beta_4^{S} NALC_{jt} \times NALC_{it} \\ + \beta_5^{S} CC_{ijt} \end{array}\right) \times \varepsilon_{ijt}$$

	Agriculture	**Manufacture**
ALC_{ijt} x $\ln(1+MP_{ijt})$	2,9823***	1,2745***
$\ln(1+NMF_{jt})$	-5,9882***	-5,9882***
ALC_{ijt} x $NALC_{it}$	0,0039**	0,0052***
$ALCi_{jt}$ x $NALC_{jt}$	-0,0055***	-0,0029**
$NALC_{it}$ x $NALC_{jt}$	0,0002***	0,0001***
CC_{ijt}	0,9320***	1,2756***

Measuring the impact of structural determinants: transportation cost (distance)

In the second stage, we estimate the following equation:

$$e^{\hat{\mu}_{ij}} = \exp\left(\begin{array}{c} \vartheta_i + \psi_j \\ +\gamma_1\, sl_{ij} \\ +\gamma_2\, is_{ij} \\ +\gamma_2\, con_{ij} \\ +\gamma_3\, lc_{ij} \\ +\gamma_4\, ln(d_{ij}) \\ +\sum_{i,j\in R} \gamma_{5,\mathrm{ij}}\, ln(d_{ij}) \times I_{ij} \end{array}\right) \times \varepsilon_{ijt}$$

	Manufactures
No seaborder (sl)	-0,0619
Island (is)	-0,187
Common language (lc)	0,631***
Contiguity (con)	0,260***
Distance (lnD)	-1,069***
lnD*(AL,AL)	-0,395***
lnD*(AN,AN)	-0,134
lnD*(Asean+3,Asean+3)	0,115

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- Distance has a larger (negative) impact on intrarregional trade in Latin America

Transport infrastructure

Key component in the trade costs

Features

- Network structure
- Modal composition
- Links and nodes

Quantity, quality and placement

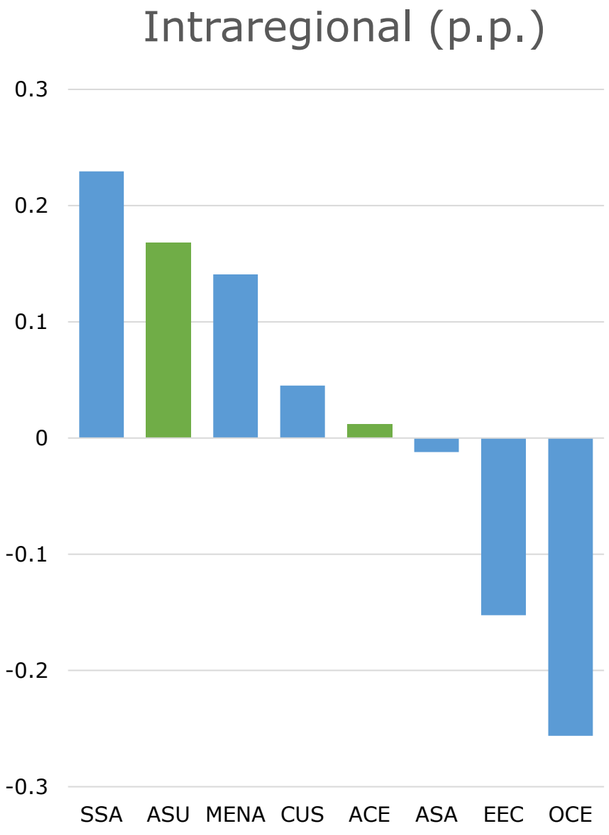
Determine costs:

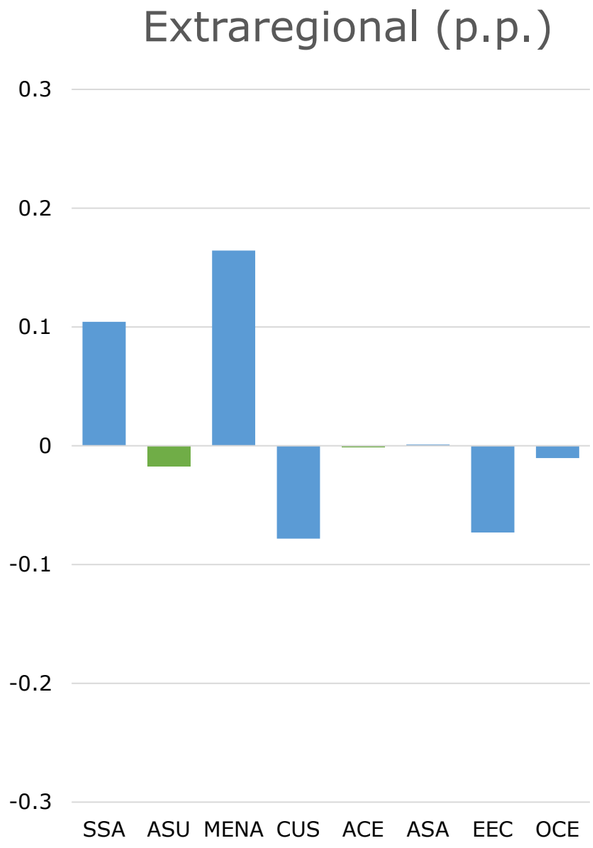
- Monetary
- Time
- Uncertainty

The impact of transport costs is heterogeneous among regions and sectors

Transport infrastructure: transport costs

Transport costs relative to EU, 2019





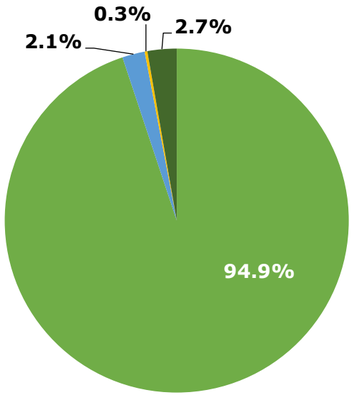
- Transport cost within South America are 15% larger than within EU.
- These higher costs are not present in extraregional trade.
- These cost are in part determined by modal choices

Transport infrastructure: modal composition

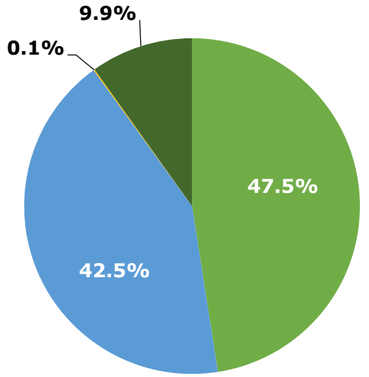
Quantity and quality of road network is relevant for intraregional trade

Total international trade

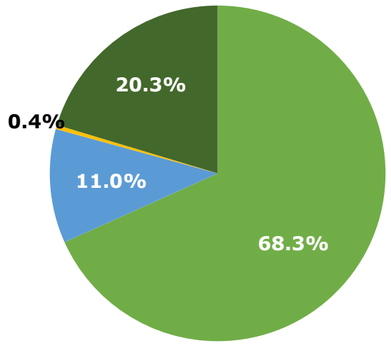
South America



Central America & Mexico

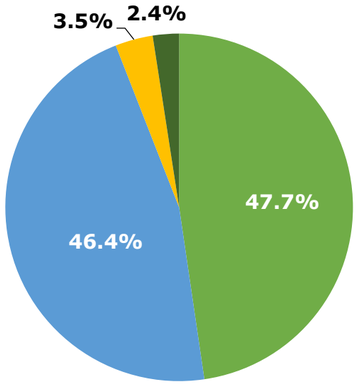


USA

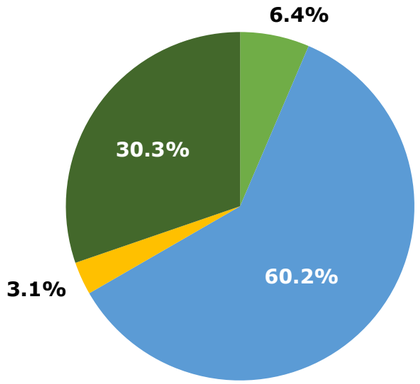


Intraregional trade

South America

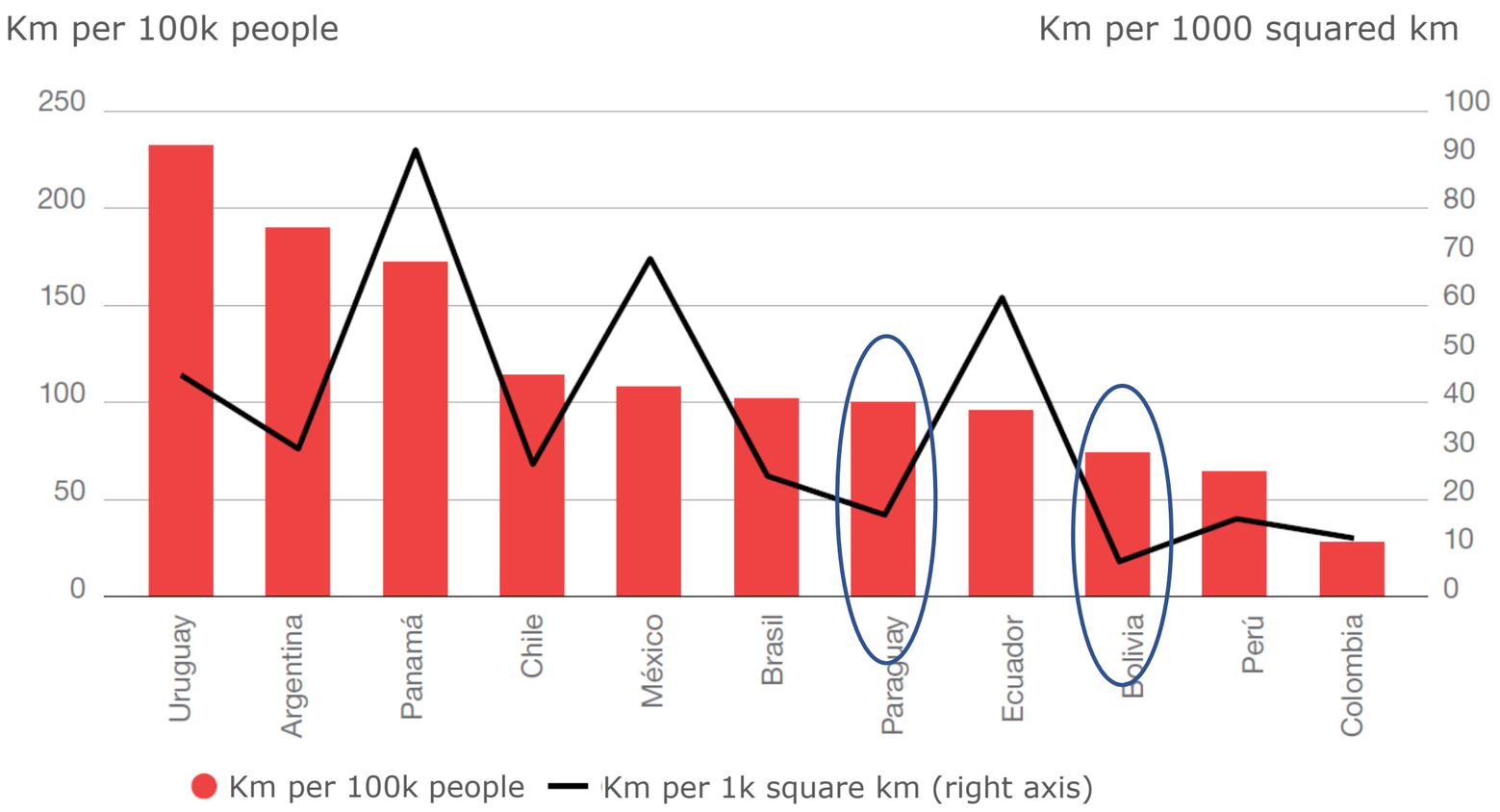


USA– NAFTA partners



Quantity and quality indicators of transport infrastructure in LAC

Paved (interurban) roads per population and country surface area



- Two alternative measures: km per 1000 squared km and km per 100000 people;
- Low coverage of paved road in LATAM: 36 km per 1000 squared km OCDE: 140 km per 1000 square km
- Latin America average of km of paved roads per 100K people: 120; North America: 400; Europe: 600
- Different metrics show different rankings depending on geography of countries and concentration of population

Transport infrastructure: changes in market access by improving quality of road network

Country	Domestic conectivity	External conectivity	
	Gain (%)	Gain in population (millions)	Gain over domestic market (%)
Argentina	18,8	26,5	84,6
Bolivia	103,3	57,0	873,0
Brazil	78,1	34,4	37,0
Chile	12,9	17,3	138,9
Colombia	113,2	77,6	317,8
Costa Rica	11,7	2,4	88,3
Ecuador	68,3	26,1	291,5
El Salvador	26,7	7,3	275,0
Guatemala	73,9	34,0	332,2
Honduras	60,7	8,1	163,1
Mexico	26,1	5,0	7,3
Nicaragua	53,0	4,3	162,7
Panama	9,4	2,3	82,8
Paraguay	50,3	43,9	1003,4
Peru	42,8	59,6	334,9
Uruguay	6,1	22,5	855,6
Venezuela	29,5	82,3	423,5
Spain	0,4	0,3	1,2
USA	0,0	0,0	0,0

- Large gains for most LA countries of improving average speed to 90 km/h.
- For small countries, access to foreign markets seems crucial.
- Large impacts in external conectivity for small, landlocked countries
- Almost no gains for Spain and the US.

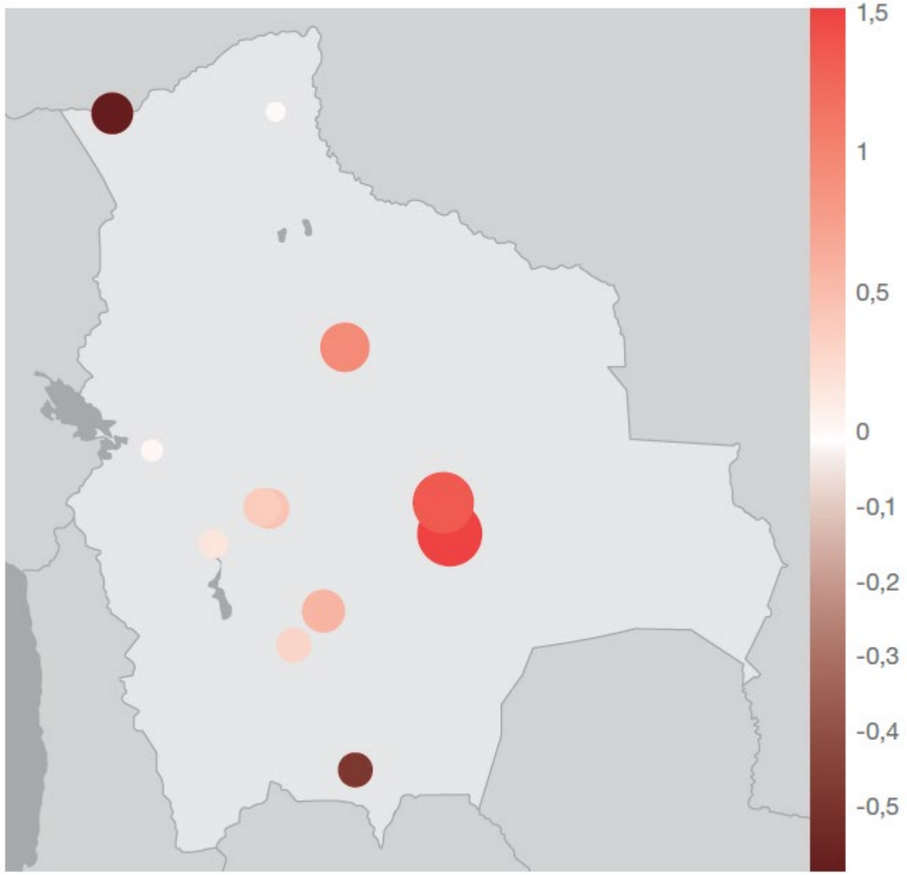
Transport infrastructure: Santa Cruz-Puerto Suarez Corridor : Evaluating its impact using a quantitative spatial GE model

Fuente: Elaboración propia con base en Cosiplan (2017).

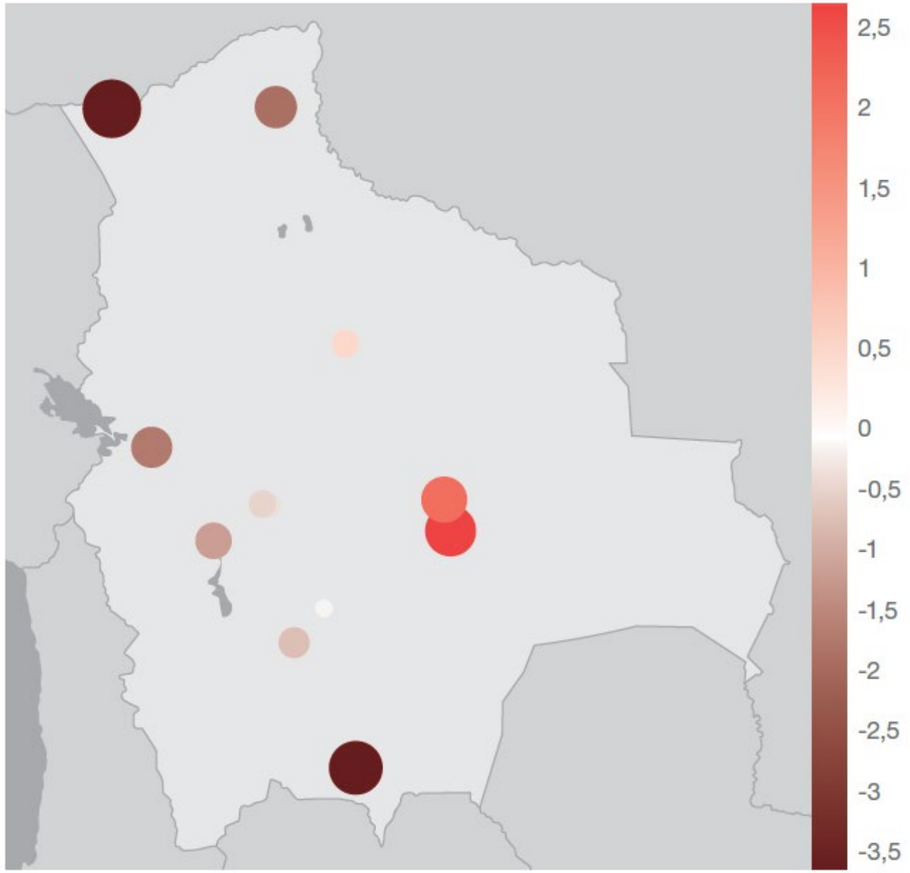
- We study the likely impact of a large infrastructure project (paved road) linking Santa Cruz and Puerto Suarez (at the Brazilian frontier)
- We assume that in the counterfactual (without the new paved road) the average travel time would be twice of what it is now
- We use the model described in Redding & Rossi-Hansberg (2016) with a two-country set up (Bolivia and Brazil)

Transport infrastructure: Santa Cruz-Puerto Suarez Corridor:
Evaluating its impact using a quantitative spatial GE model

Change in real wages (p.p.)



Reallocation of population (p.p.)



- Large positive impacts for Bolivia, 0.5pp real GDP annually
- Heterogeneous across regions: cities far from project suffer loss of real wages and population
- Montero (center top) and Santa Cruz (center bottom) most favored by project
- Increase in access to importers and consumers leads to higher productivity, lower consumer prices, which attracts workers

Transport infrastructure: NOA-Rosario intervention.

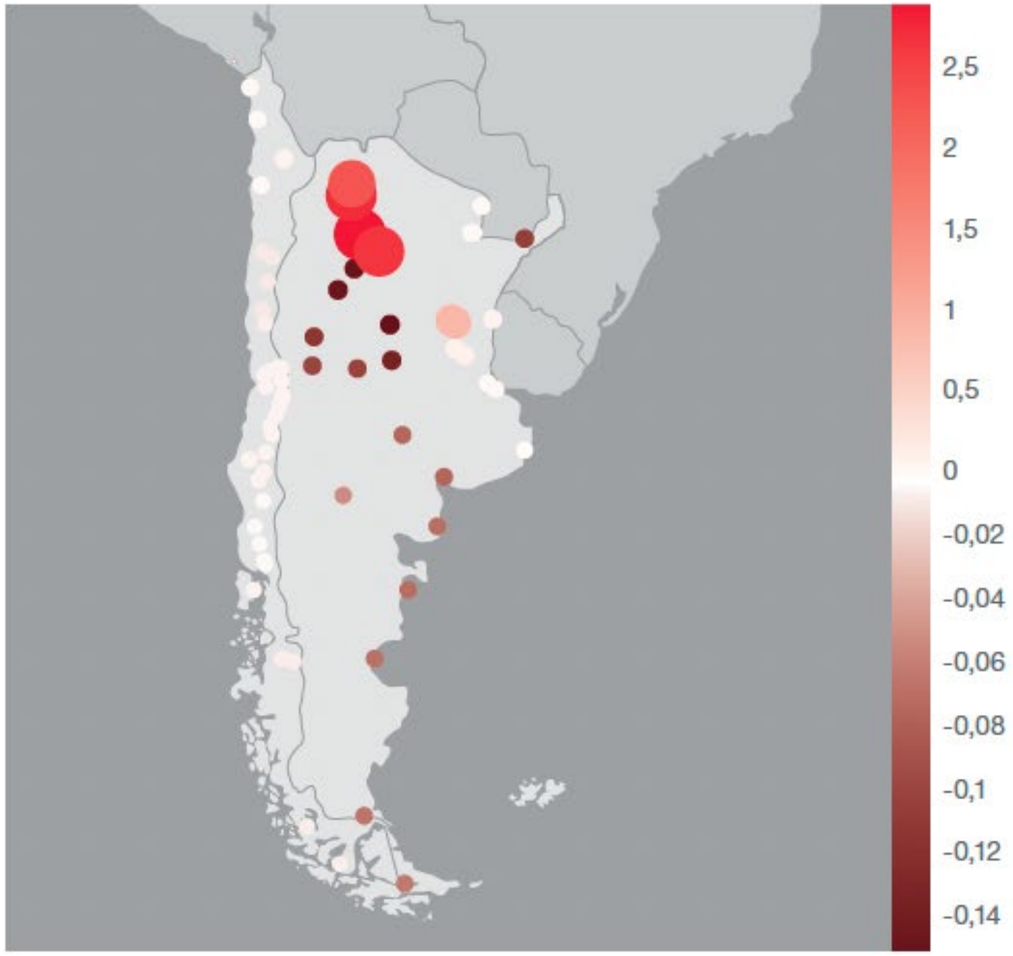
Evaluating its impact using a quantitative spatial GE model

- We study a potential intervention connecting Paso de Jama (Jujuy) with the port of Rosario (Santa Fe).
- The intervention implies an increase in average speed to 90 km/h.
- We use the model described in Redding & Rossi-Hansberg (2016) and we add a Rest of the World.

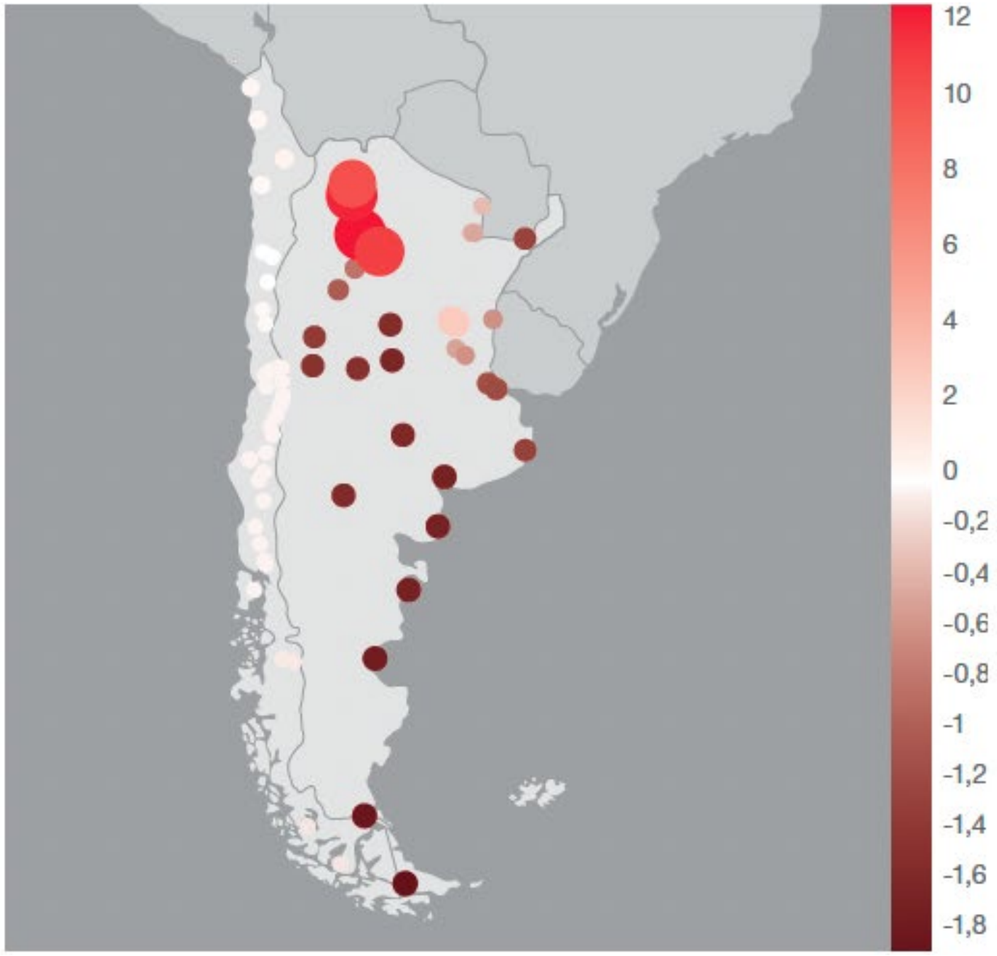
Transport infrastructure: NOA-Rosario intervention.

Evaluating its impact using a quantitative spatial GE model

Welfare change (p.p.)



Population change (p.p.)



Transport infrastructure: policies

Investment levels comparable with respect to OECD (% GDP)	• …but GDP levels in Latin Ameria are much lower.
Balance between new projects, replacements and maintenance	• Maintenance takes nearly 1/3 of total infrastructure costs. • Allows a consistent level of services throughout service life. • **Challenges:** less political rewards than new projects, difficulties in monitoring and early detection of deterioration, difficulties with external funding.

Project priorization	• Focus in **Integration Logistics Corridors**
	  • Provides support to the value chain from beginning to end.
	  • Contemplates various modes of transport, logistic development areas, secondary and tertiary networks
	  • Has strong presence in national development plans and multilateral agreements.
	• Use of **tools in spatial economics** for priorization and evaluation analysis.

Multilateral cooperation as coordination device	• Most trade agreements include infrastructure plans. • Important for solving coordination problems.

Concluding remarks

- Latin America face important trade costs that in part explain the low level of intraregional trade

- Transport cost seems to be one key ingredient. The region is not taking advantage of geographic proximity to increase trade and develop regional value chains (RVC)

- This high transport cost affects specially for landlocked countries within the region. Large gains from improving access to regional markets

- Policies for improving transportation infrastructure: planning and project identification strategies; combine public/private funding (PPP)

- Cooperation among neighboring countries using the framework of regional trade agreements. Most of them include special funds for infrastructure. Collaboration with regional development banks

CAF BANCO DE DESARROLLO DE AMÉRICA LATINA

Detrás de todo lo que hacemos estás tú