



INTERNATIONAL MEETING ON SERVICES VALUE-ADDED IN EXPORTS

Services and trade policies
for diversification and upgrading
Brasilia, Brazil, 22-23 October 2019

APPLICATION OF METHODOLOGY: MEASURING SERVICES VALUE-ADDED IN BRAZIL

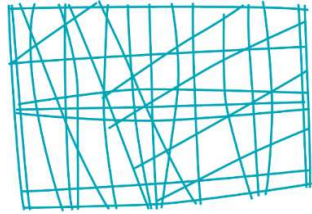
Presentation by

Professor Eduardo Amaral Haddad
Consultant

United Nations Conference on Trade and Development (UNCTAD)

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Application of Methodology: Measuring Services Value-Added in Brazil

*International meeting on services value-added in exports:
Services and trade policies for diversification and upgrading
Brasília, 22-23 October 2019*

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Consultant, UNCTAD

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Objectives

Propose (and document) a methodology to measure services value added in Brazilian exports, which can be replicate to other countries

Apply the proposed framework to characterize exports of services value added in Brazil, concerning partner countries, for both goods and services

Overview of the results, highlighting some of the findings for Brazil and potential extensions

Data sources

National input-output matrix (“anchor”)

- Published by IBGE
- Base year: 2015
- Products: 127 (goods and services)
- Sectors: 67 (non-services and services)

International trade flows

- COMEX STAT (goods)
- SISCOSEV (services)

Employment data by gender

- *Pesquisa Nacional por Amostra de Domicílios – PNAD* (IBGE)

List of countries/groups of countries

| | |
|-------------------------|-----------------------|
| África do Sul | South Africa |
| Resto da América Latina | Rest of Latin America |
| Argentina | Argentina |
| Chile | Chile |
| China | China |
| Colômbia | Colombia |
| Estados Unidos | USA |
| Índia | India |
| México | Mexico |
| Peru | Peru |
| Resto do Mundo | Rest of the World |
| Rússia | Russia |
| União Europeia | European Union |

Excel file

Metadata and outputs regarding the measurement of services value added in exports of all economic sectors in Brazil, and regarding its combination with trade and employment data

Whenever pertinent, cross-reference between the contents of the Excel file and the documentation is provided in “boxes” throughout the text, so that the reader can follow the technical report looking at numerical examples taken from the actual data for Brazil

Focus on total and initial “impacts” provides the opportunity to derive different multipliers

Dimensions: products (127), sectors (67), foreign destinations (13), outcome variables (3 – value added, total employment and female employment)

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Sectoral aggregation

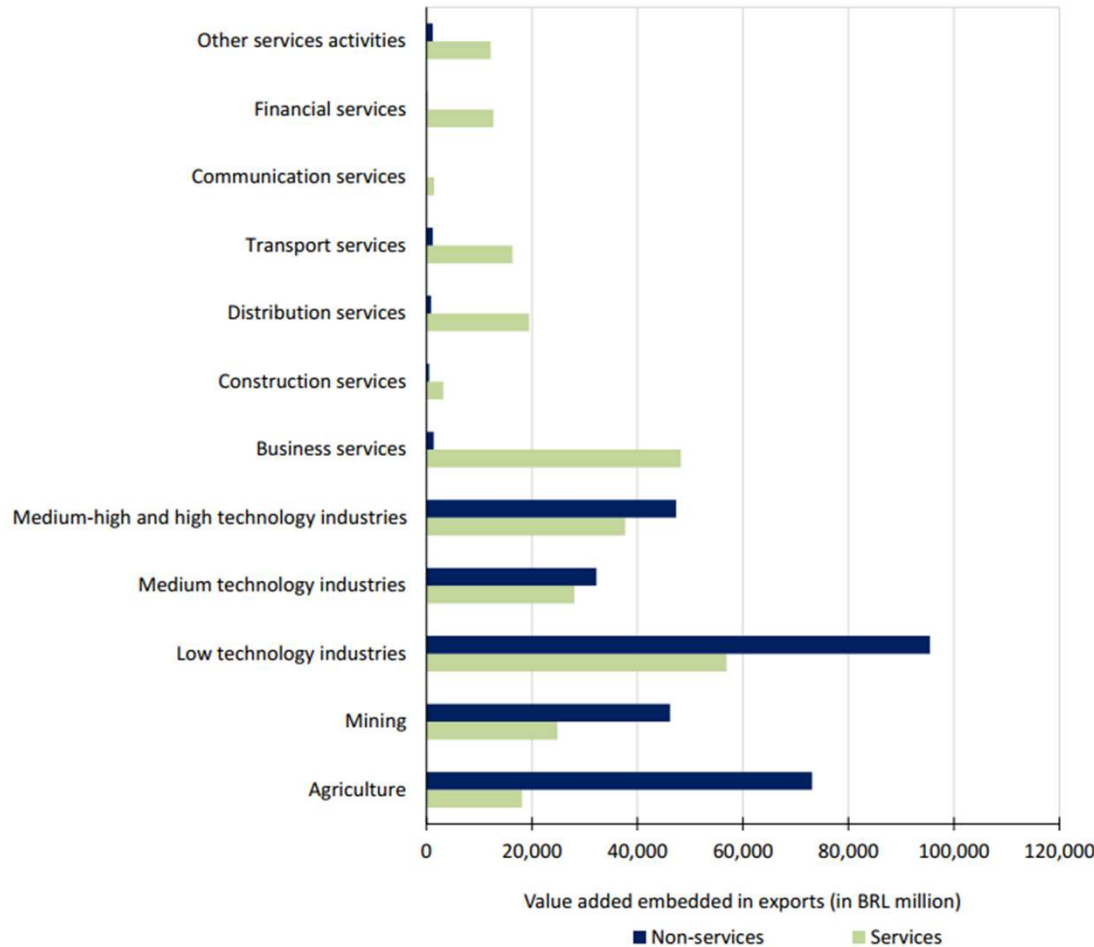
For presentation purposes, we have aggregated the 67 sectors into 12 groups: manufacturing sectors by technological intensity (ISIC Revision 4); services classified following WTO

| <i>Classification</i> | <i>Code</i> |
|--|-------------|
| Agriculture | 1 |
| Mining | 2 |
| Low technology industries | 3 |
| Medium technology industries | 4 |
| Medium-high and high technology industries | 5 |
| Business services | 6 |
| Construction services | 7 |
| Distribution services | 8 |
| Transport services | 9 |
| Communication services | 10 |
| Financial services | 11 |
| Other services activities | 12 |

Summary: trade in value added – Brazil, 2015

| | | Exports | | |
|--|--------------|----------------|----------------|----------------|
| | | Goods | Services | Total |
| Domestic value added embedded in exports | Services | 170,876 | 108,353 | 279,229 |
| | Non-services | 294,072 | 5,600 | 299,672 |
| | <i>Total</i> | <i>464,948</i> | <i>113,953</i> | <i>578,901</i> |
| Share in total domestic value added | Services | 36.75 | 95.09 | 48.23 |
| | Non-services | 63.25 | 4.91 | 51.77 |
| | <i>Total</i> | <i>100.00</i> | <i>100.00</i> | <i>100.00</i> |
| Shares in total gross exports | Services | 27.0 | 81.2 | 36.4 |
| | Non-services | 46.4 | 4.2 | 39.1 |
| | <i>Total</i> | <i>73.4</i> | <i>85.4</i> | <i>75.5</i> |
| Gross exports | <i>Total</i> | <i>633,603</i> | <i>133,429</i> | <i>767,032</i> |

Contribution of sectoral exports to domestic value added in services and non-services activities (in BRL million)

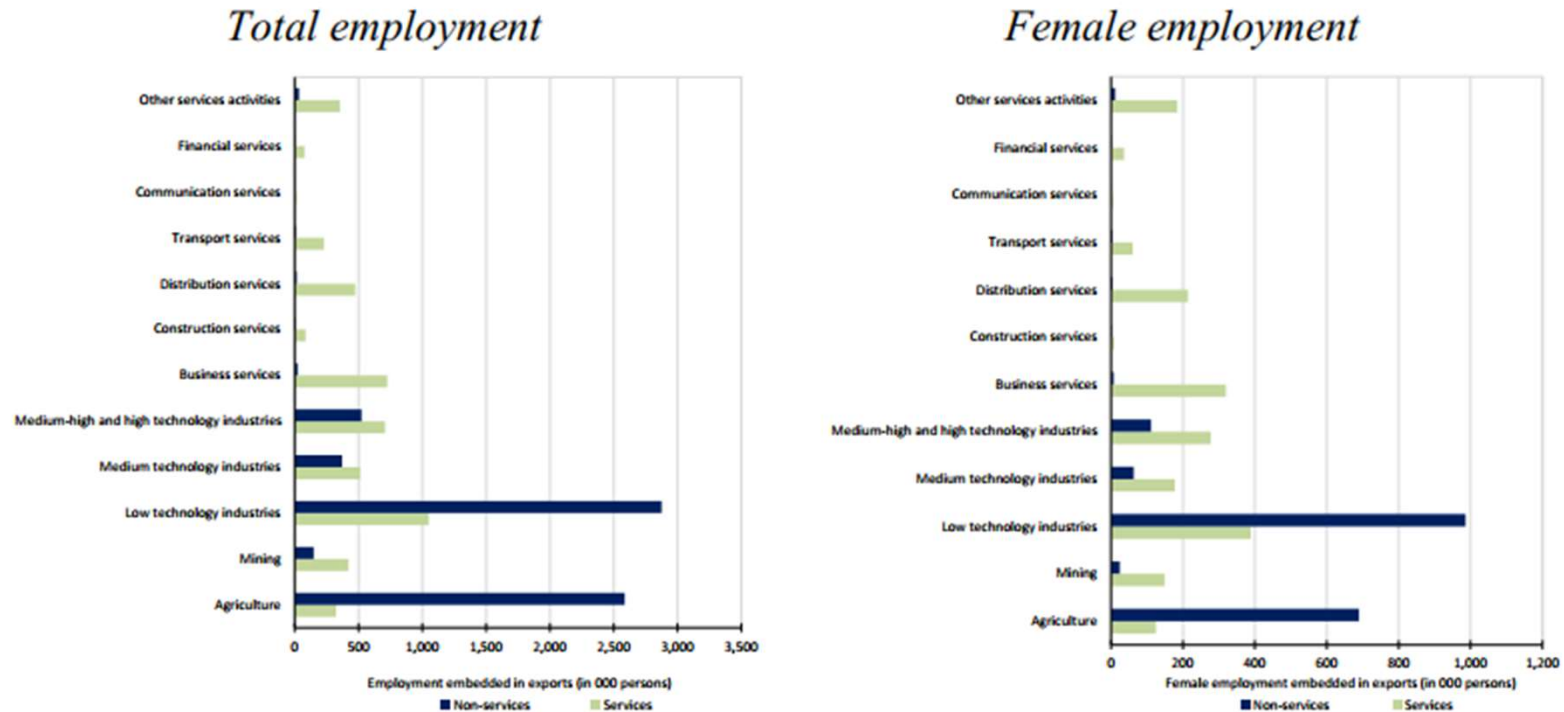


Among services sectors, business services exports contribute more for domestic value added exports, mainly concentrated in services activities. It is noticeable that indirect services demand associated with the domestic value chain of exports of goods may be more relevant for generating value added in services. For example, exports of low technology industries are responsible for the higher share of total domestic value added embedded in Brazilian exports.

What are the goods whose exports contribute with more services value added to the economy?

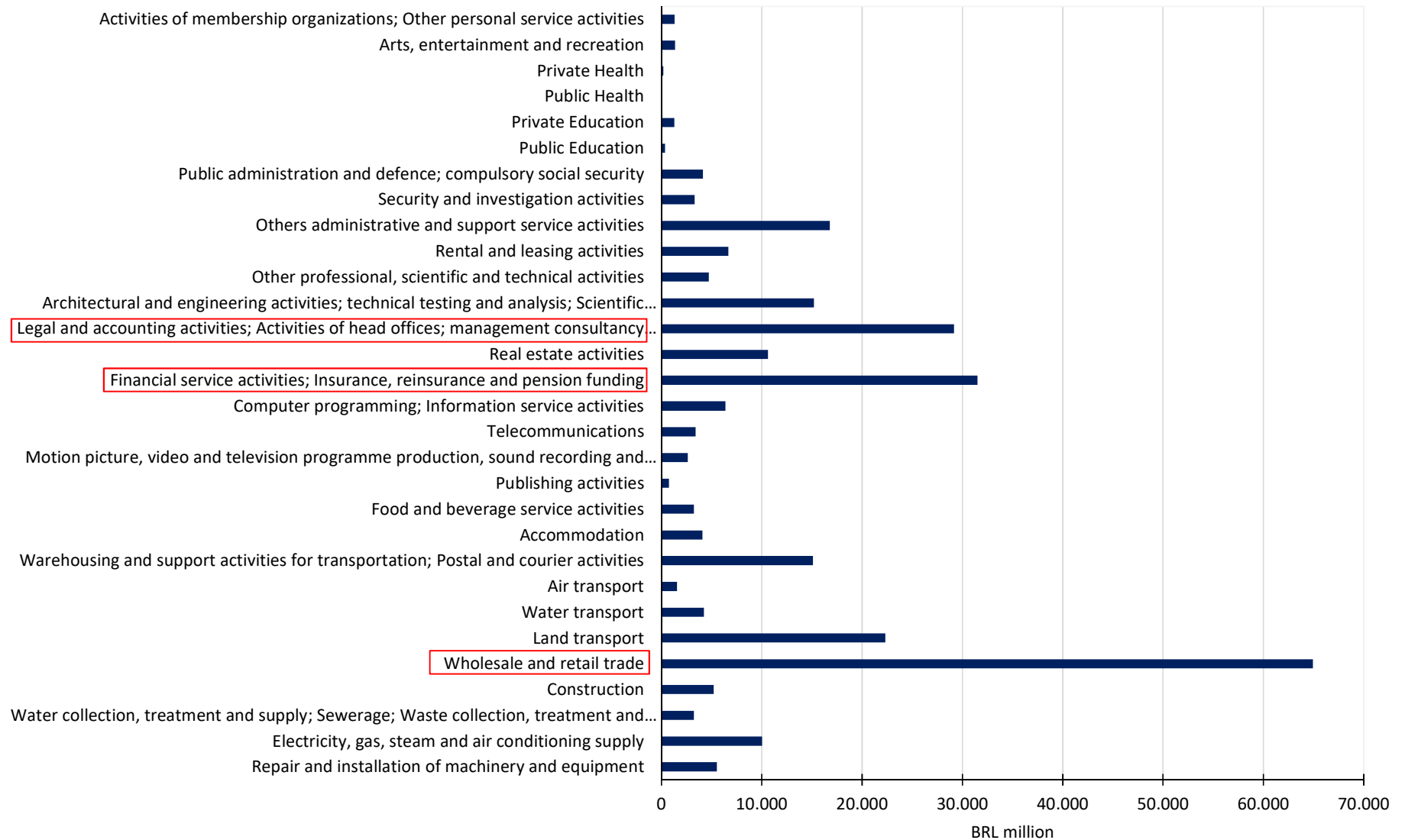
| | <i>BRL million</i> | <i>% of total</i> |
|--|--------------------|-------------------|
| 1 Iron ore | 12,227 | 7.2 |
| 2 Soybeans | 10,818 | 6.3 |
| 3 Oil and natural gas | 9,758 | 5.7 |
| 4 Semi-finished iron products, flat rolled and steel pipes | 9,348 | 5.5 |
| 5 Vegetable and animal oils and fats | 8,778 | 5.1 |
| 6 Non-ferrous metallurgy products | 8,475 | 5.0 |
| 7 Poultry meat | 8,154 | 4.8 |
| 8 Beef and other products of meat | 7,571 | 4.4 |
| 9 Sugar | 6,518 | 3.8 |
| 10 Aircraft; ships and boats; other transport equipment | 5,920 | 3.5 |
| 11 Cellulose | 5,762 | 3.4 |
| 12 Parts and accessories for motor vehicles | 4,626 | 2.7 |
| 13 Motor vehicles | 4,462 | 2.6 |
| 14 Other mechanical machinery and equipment | 4,417 | 2.6 |
| 15 Commercial vehicles; buses; bodies (coachwork) for motor vehicles | 3,656 | 2.1 |
| 16 Pig iron and ferroalloys | 3,487 | 2.0 |
| 17 Processing and preserving of fruit and vegetables | 2,983 | 1.7 |
| 18 Coffee beans | 2,952 | 1.7 |
| 19 Leather and related products | 2,928 | 1.7 |
| 20 Non-ferrous metal minerals | 2,737 | 1.6 |
| Accumulated | 125,577 | 73.5 |
| TOTAL | 170,876 | 100.0 |

Contribution of sectoral exports to total and female employment in services and non-services activities (in 000 persons)



In terms of employment, there seems to be a strong demand for labor services to support exports of medium, and medium-high and high technology industries. Overall, 60.6% of employment in services are related to direct exports of goods. Services employment embedded in direct exports of services concentrate in services activities. However, female shares vary across sectors. While female shares in services employment associated with exports from some sectors are above 45% (other services activities, 52.1%; financial services, 46.9%, and distribution services, 45.2%), from other sectors it does not even reach 10% of total employment (construction services, 9.9%)

Total domestic services value added embedded in total exports, by sector (in BRL million)



Measuring the “error”

Inter-country *versus* National input-output matrix

By precluding feedback effects via trade linkages, our estimates will underestimate domestic value added in exports.

| | | Country 1 | | Country 2 | | Country 1 | Country 2 |
|----------------------------------|------------|------------|------------|--------------|--------------|-----------------------|-----------------------|
| | | Industry 1 | Industry 2 | Industry 1 | Industry 2 | Domestic Final Demand | Domestic Final Demand |
| Country 1 | Industry 1 | A_{11} | A_{12} | M^{2}_{11} | M^{2}_{12} | D_1 | MD_1 |
| | Industry 2 | A_{21} | A_{22} | M^{2}_{21} | M^{2}_{22} | D_2 | MD_2 |
| Country 2 | Industry 1 | M_{11} | M_{12} | A^{2}_{11} | A^{2}_{12} | MD_1 | D^2_1 |
| | Industry 2 | M_{21} | M_{22} | A^{2}_{21} | A^{2}_{22} | MD_2 | D^2_2 |
| Taxes less subsidies on products | | TP_1 | TP_2 | TP^2_1 | TP^2_2 | DTP | D^2TP |
| Value-Added at basic prices | | V_1 | V_2 | V^2_1 | V^2_2 | | |
| Output | | O_1 | O_2 | O^2_1 | O^2_2 | | |

Measuring the “error” (cont.)

Using the OECD database, we have computed domestic value added in Brazilian gross exports, using both methodologies:

- (i) the OECD TIVA methodology that takes into account inter-country linkages
- (ii) the proposed methodology, that relies only on the national input-output database embedded in the ICIO table.

Results suggest that **inter-country feedbacks represented 8.5% of domestic value added** in Brazil, in 2015, associated with the country’s gross exports

Comparing estimates of domestic value added in Brazilian exports

| | <i>Inter-country model (A)</i> | <i>Single- country (B)</i> | <i>Difference (C)=(B)-(A)</i> | <i>"Error" (D)=(C)/(A)</i> |
|--|--|------------------------------------|-----------------------------------|--------------------------------|
| Gross exports (USD million) | 227,260 | 227,260 | - | - |
| Domestic value added (USD million) | 198,810 | 181,913 | -16,897 | -8.5% |
| Domestic value added share of gross exports (%) | 87.48 | 80.05 | -7.43 | -8.5% |

Our estimate with the
IBGE data = 75.5

Measuring the “error”: policy consequence

Not using an inter-country model not only underestimates the true share of domestic value added but also ignores the importance of regional value chains

For regional economic blocks such as MERCOSUR, SADC and AfCFTA, a regional perspective can be important to properly assess member states' benefits from these regional trade flows as imported goods from neighbors include some domestic value added as well

Moreover, to properly assess “rules of origin” in trade negotiations, the regional aspect of domestic value addition needs to be correctly measured

Negotiating as a group instead of a country have these advantages, internalizing some of these external effects



Spatial domestic value chains

The proposed methodology can be **extended** to multi-regional input-output tables

| | Buying Sectors Region L | Buying Sectors Region M | | | |
|-----------------------------|-----------------------------------|-----------------------------------|-----------------|-----------------|----------------|
| Selling sectors Region L | Interindustry Inputs <i>LL</i> | Interindustry Inputs <i>LM</i> | FD <i>LL</i> | FD <i>LM</i> | TO <i>L</i> |
| Selling sectors Region M | Interindustry Inputs <i>ML</i> | Interindustry Inputs <i>MM</i> | FD <i>ML</i> | FD <i>MM</i> | TO <i>M</i> |
| | Imports from the World | Imports from the World | M | M | M |
| | Sales Taxes | Sales Taxes | T | T | T |
| | Value Added | Value Added | | | |
| | Total Output <i>L</i> | Total Output <i>M</i> | | | |

Examples include Angola, Brazil, Chile, Colombia, Ecuador, Egypt, Lebanon, Mexico, Morocco...

Research Paper
August 2017

A Practitioner's Guide for Building the Interregional Input-Output System for Morocco, 2013

EDUARDO AMARAL HADDAD
FATNA EL-HATTAB
ABDELAZIZ AIT ALI

Revista de Economía del Caribe, NO. 21: ENE-JUN 2018

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Matriz insumo—producto interregional para Colombia
Interregional input—output matrix for Colombia

Eduardo Haddad*
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Lucas Wilfried Hahn—De—Castro*

Borradores de ECONOMÍA

Interregional Input-Output Matrix for Colombia, 2012

Por: Eduardo Amaral Haddad,
Weslem Rodrigues Faria,
Luis Armando Galvis-Aponte,
Lucas Wilfried Hahn-De-Castro

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المحتويات

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ساره جدي

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MATRIZ INTERESTADUAL DE INSUMO-PRODUTO PARA O BRASIL: UMA APLICAÇÃO DO MÉTODO HOAS*

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Interregional Input-Output Tables for Mexico, 2013

Reference: Haddad, E. A., Araújo, I. F., Ibararán, M. E., Boyd, R., Elizondo, A., Liedo, P., Belausteguigoitia, J. C., and Menchero, M. (2019). Interregional Input-Output System for Mexico, 2013, *TD NEREUS 07-2019*, The University of São Paulo Regional and Urban Economics Lab (NEREUS).

IBERO IIMA Instituto de Investigaciones en Medio Ambiente Xavier Gorostiaga, S.J. / PUEBLA

CENTRO ITAM
ENERGÍA Y RECURSOS NATURALES

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Accessibility, transportation cost, and regional growth: a case study for Egypt
Dina N. Elshahawany, Eduardo A. Haddad & Michael L. Lahr

Inter-regional IO tables

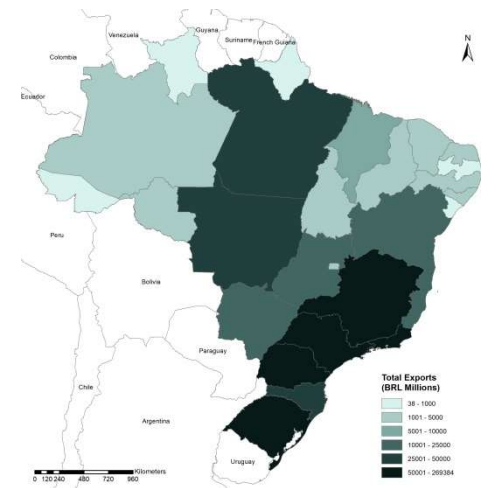
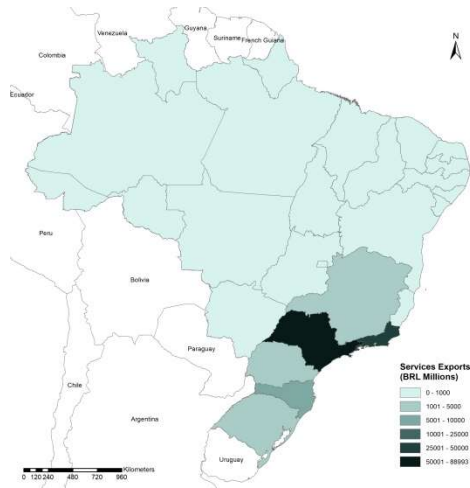
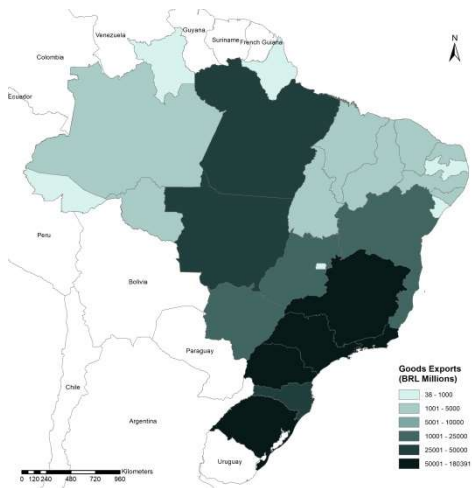
Brazil:

- (To be) published by FIPE
- Base year: 2015
- Sectors: 67 (non-services and services)
- Regions: 27

Other (recent) LA countries:

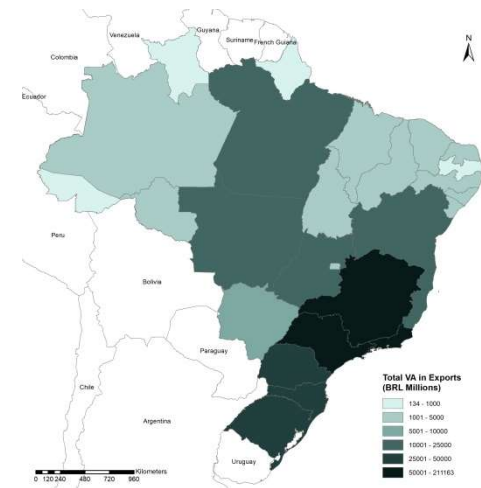
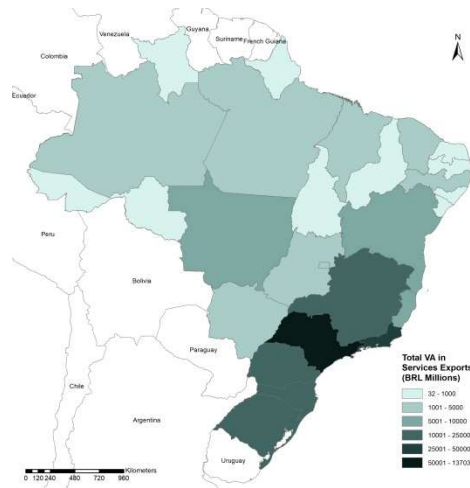
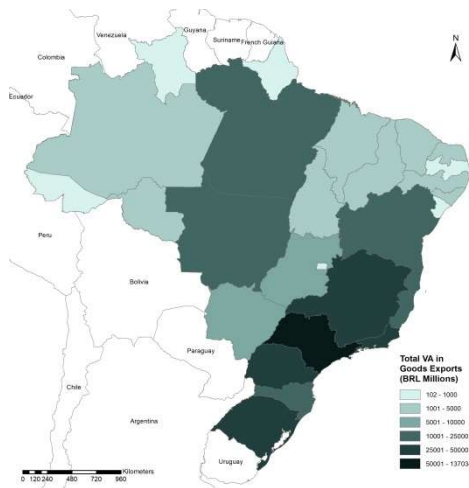
- Chile (2013): 12 sectors, 15 regions
- Colombia (2015): 54 sectors, 33 regions
- Mexico (2013): 32 sectors, 32 regions

Gross exports – Brazil, 2015



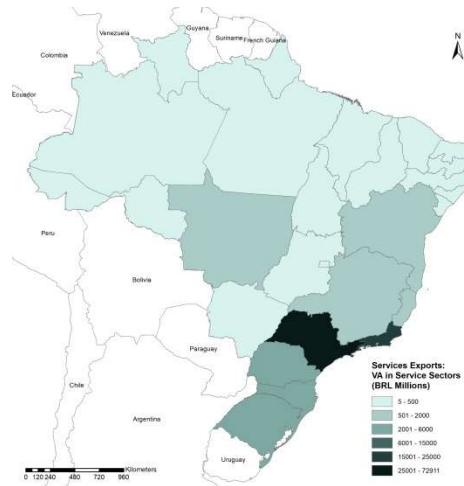
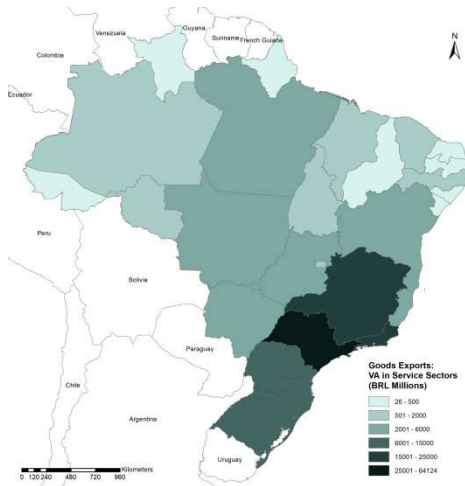
| Exports | | |
|---------|----------|---------|
| Goods | Services | Total |
| 633,603 | 133,429 | 767,032 |

Total value added in exports – Brazil, 2015



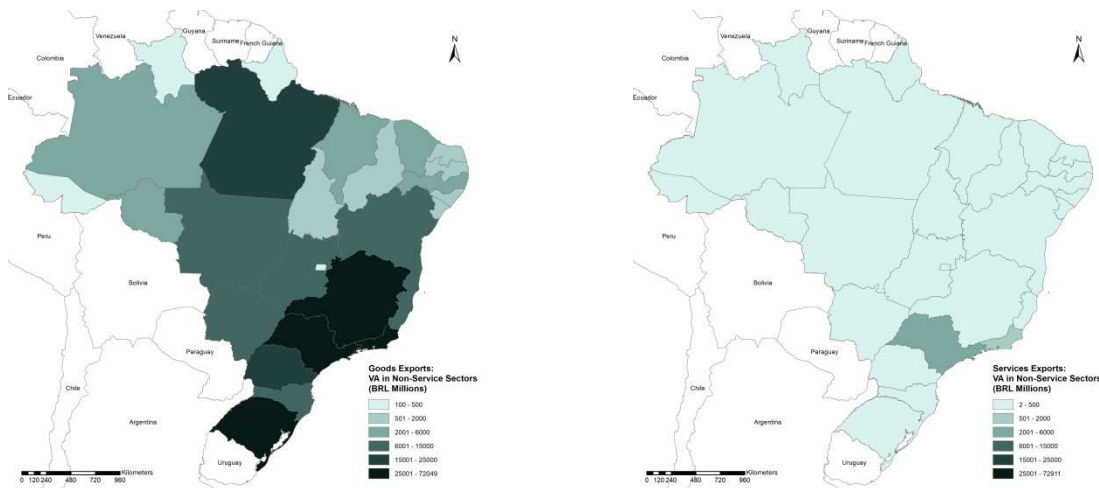
| Exports | | |
|---------|----------|---------|
| Goods | Services | Total |
| 464,948 | 113,953 | 578,901 |

Total services value added in exports – Brazil, 2015



| Exports | | |
|---------|----------|---------|
| Goods | Services | Total |
| 170,876 | 108,353 | 279,229 |

Total non-services value added in exports – Brazil, 2015

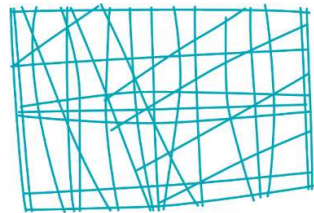


| Exports | | |
|---------|----------|---------|
| Goods | Services | Total |
| 294,072 | 5,600 | 299,672 |

Thank you!

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