NEREUS
Núcleo de Economia Regional e Urbana
da Universidade de São Paulo
The University of São Paulo
Regional and Urban Economics Lab

The Interplay of Services Productivity and Competitiveness of Colombian Exports

"International Workshop on Interregional Economic Modeling: Applications for the Colombian Economy"

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Introduction

Services are becoming more and more important all over the world, as their **share in global GDP reached 65,0%** in 2018 (Colombia, 57.8%)

Services also present a **large and increasing share of value-added in global and regional value chains**, with an overall contribution to the value of global manufacturing exports above 60% (Miroudot and Cadestin, 2017)

There is substantial **value-added of services incorporated in goods exports**, from intermediate services and from services bundled with goods

Services' value-added play a key role in development, given their direct and indirect contributions to production, trade and employment, providing the **linkages between services and goods competitiveness**

Knowledge-Intensive-Business-Services (KIBS)

Rely heavily upon professional knowledge

Primary sources of information and knowledge (e.g. reports, training consultancy etc.)

Apply knowledge to produce intermediary services for their clients' production processes (e.g. communication and computer services)

Supply primarily to other businesses

Heterogeneity: traditional professional services *versus* new-technology-based services

Location patterns tend to be dominated by agglomeration economies

KIBS in Colombia (16% of GDP)

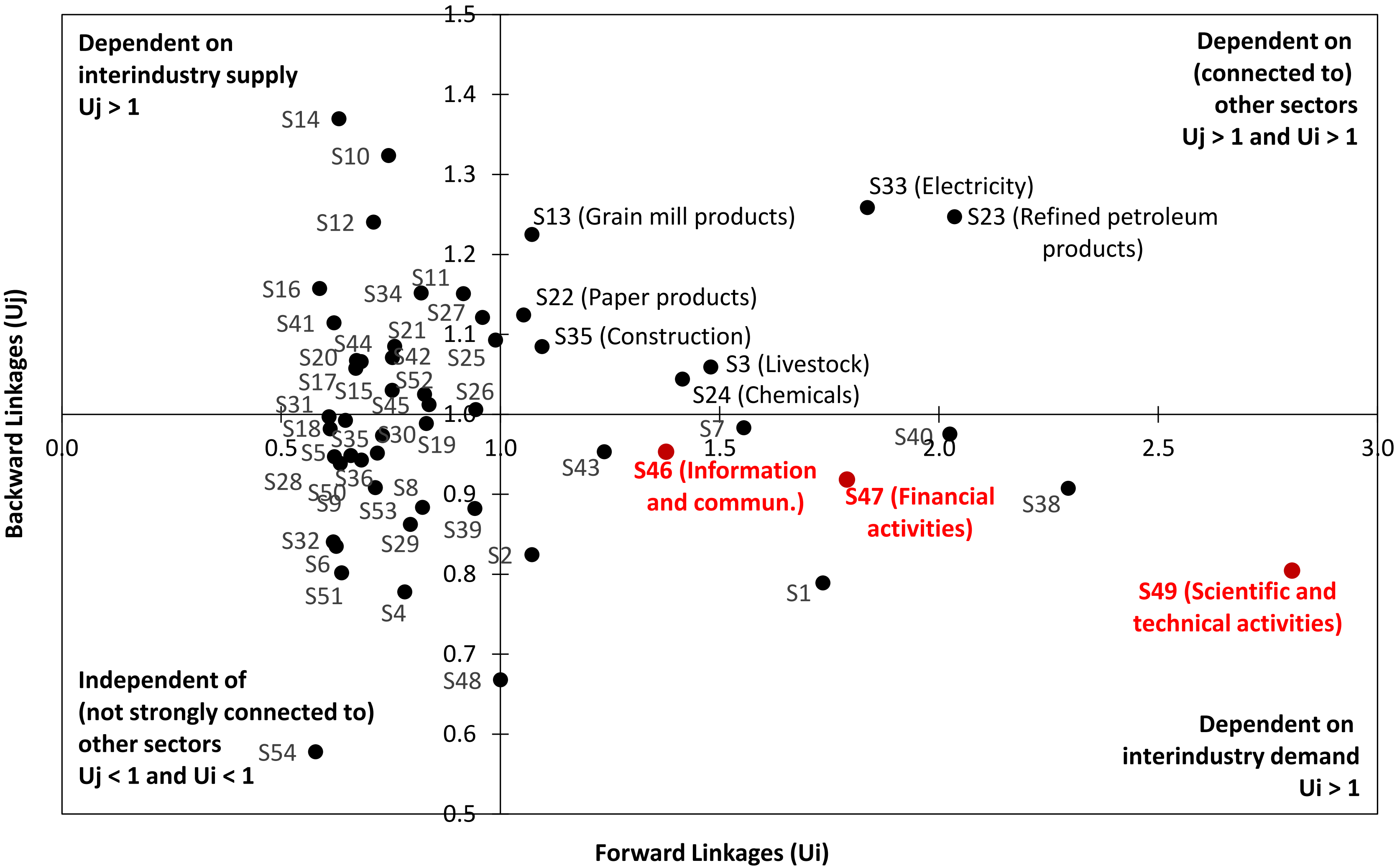
Information and Communication – **S46** (3% of GDP)

Financial activities and Insurance – **S47** (5% of GDP)

Professional, scientific and technical activities; Administrative and support services activities – **S49** (8% of GDP)

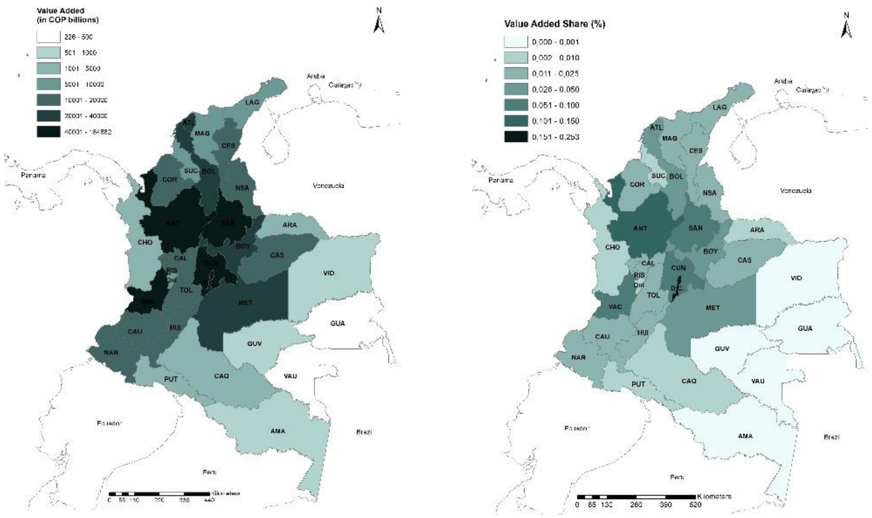
Sectors	Capital requirements	Labor requirements
S46	0.30	0.17
S47	0.32	0.23
S49	0.27	0.42
Average	0.29	0.16

R-H backward and forward linkages

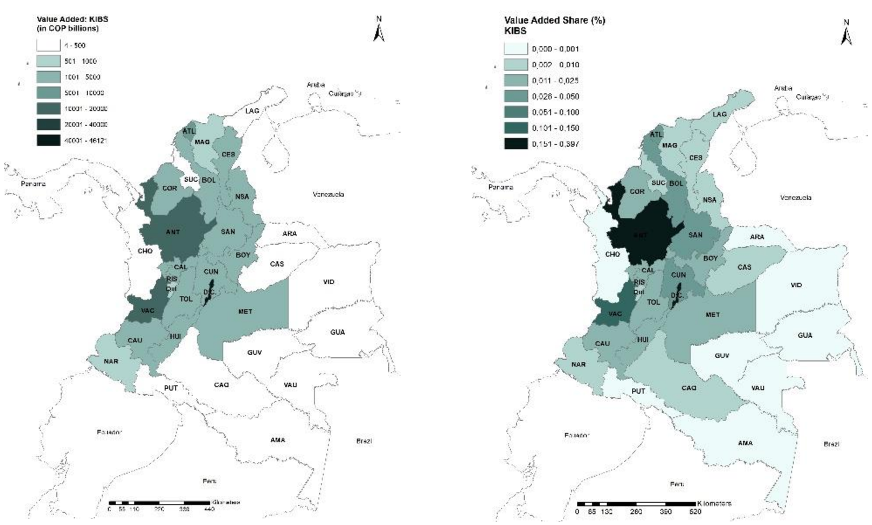


Spatial patterns of services activities in Colombia

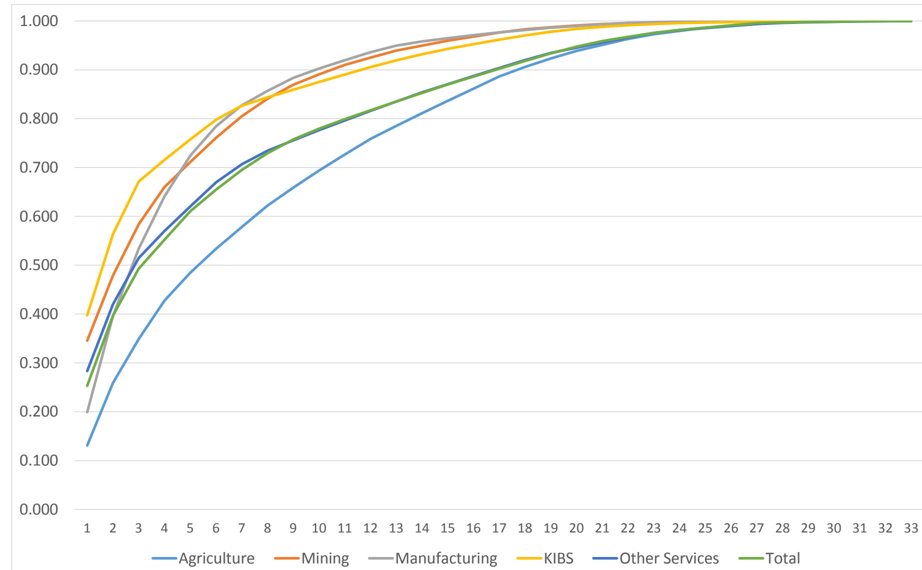
GDP



KIBS



Location Curves



Department	GDP	Services	KIBS
Bogotá D.C.	25%	28%	40%
Antioquia	14%	14%	17%
Valle del Cauca	10%	10%	11%
TOTAL	49%	52%	68%

How much services value-added is in exports and how does it compare to direct services exports?

Gross Exports

Sectors	Gross Exports (CLP Billions)	Share in VA of Exports
Goods	**103,683**	**87%**
Services	**15,314**	**13%**
KIBS	3,753	3%
Others	11,561	10%
Total	**118,997**	**100%**

VA Embodied in Exports

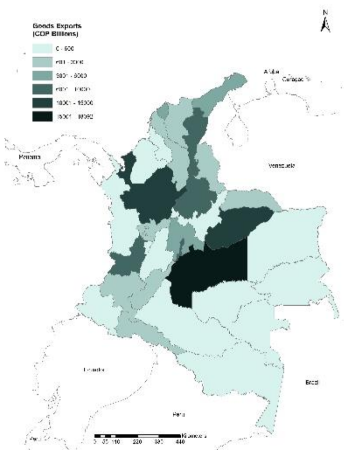
Sectors	VA in Exports (CLP Billions)	Share in VA of Exports
Goods	**66,218**	**68%**
Services	**31,429**	**32%**
KIBS	10,803	11%
Others	20,626	21%
Total	**97,647**	**100%**

Where is services value-added of exports more concentrated?

What types of services are associated with more concentrated patterns of value-added embodied in exports?

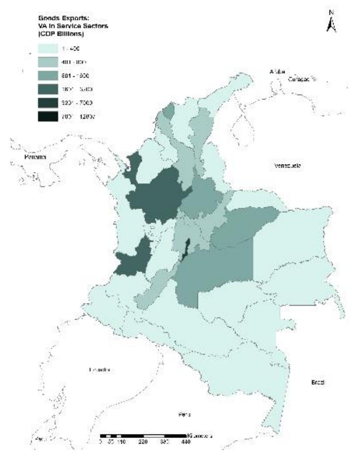
What are the main regions contributing to services value-added in the exports local value chains?

Exports of Goods



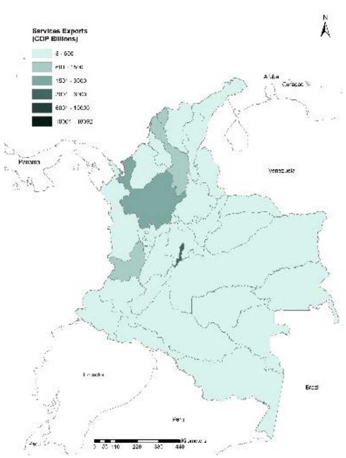
Bogotá = 7.9%

Embodied Services VA



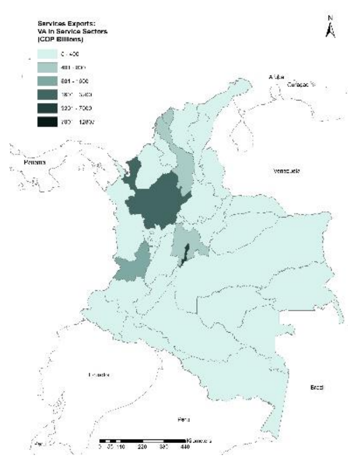
Bogotá = 22.3%

Exports of Services



Bogotá =32.7%

Embodied Services VA



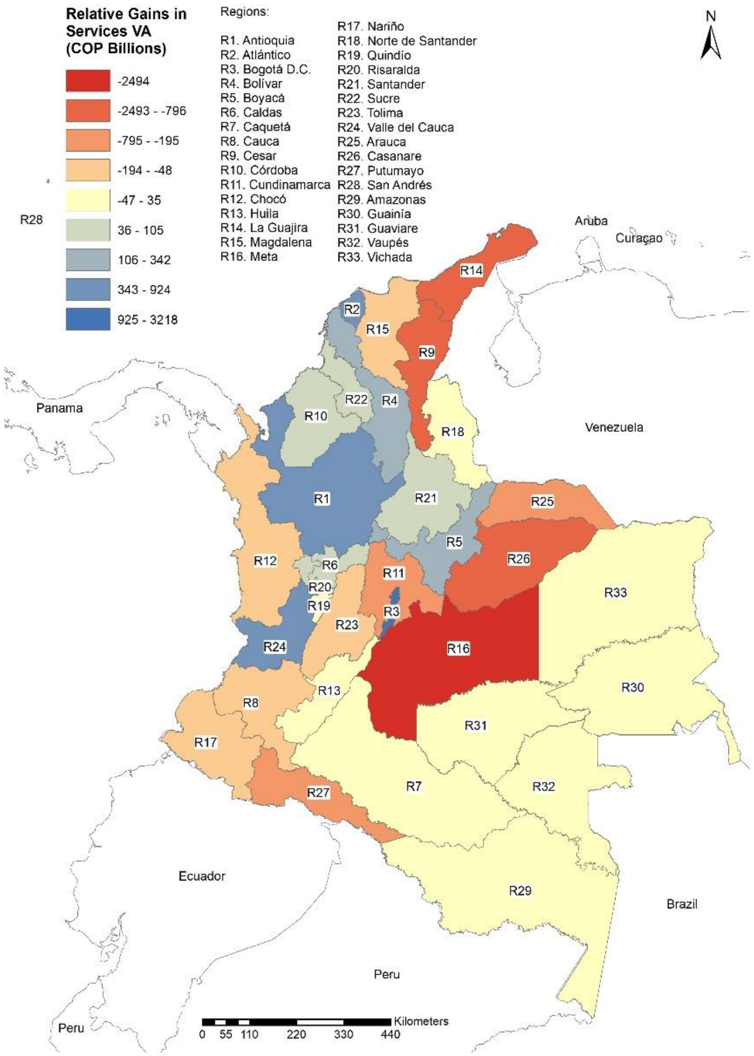
Bogotá =33.5%

Share of Primate Region in Services VA of Exports of Goods and Services

	Goods	*Services*
Business services	23.4%	33.3%
Construction services	13.7%	22.6%
Distribution services	29.9%	37.7%
Transport services	11.2%	40.4%
Communication services	34.1%	42.0%
Financial services	42.5%	51.7%
Other services activities	18.9%	20.1%

Policies linked to services content shares and services trade facilitation, may lead to the removal of important trade frictions, helping increasing competitiveness, productivity and well-being

What regions would have lost (gained) most, had the spatial distribution of exports of goods prevailed in the local generation of services value-added?



Relevance for policy

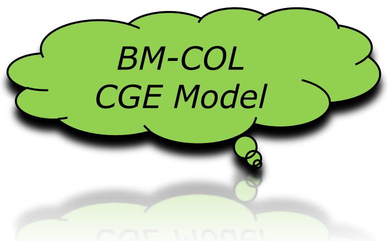
“Servicification” has potential asymmetric locational impacts, benefiting developed economies, at a global scale, and primate cities, at the national level

Global: more sophisticated services sectors exports are largely and increasingly dominated by developed economies

Local: tend to benefit larger urban agglomerations in the more developed regions, reinforcing regional inequality

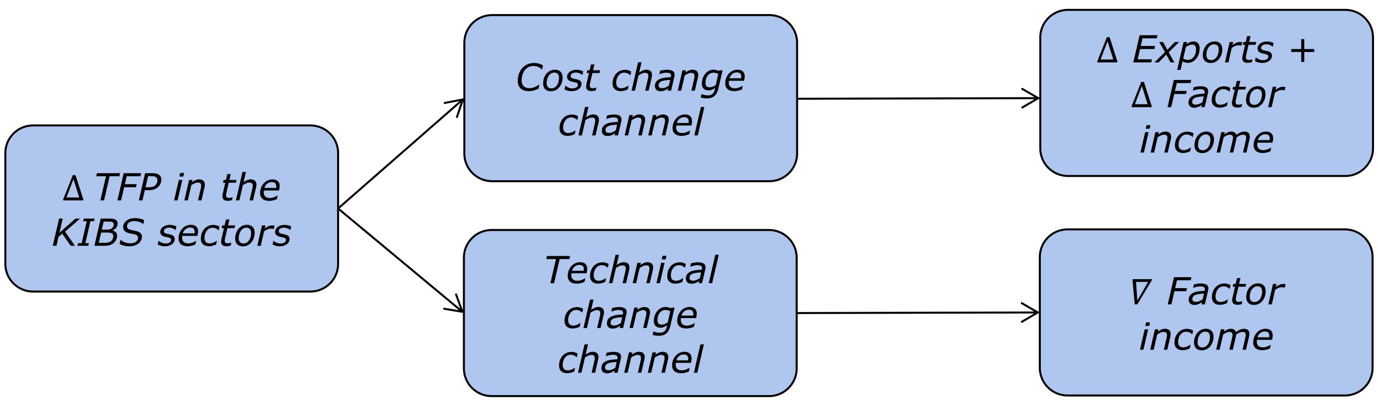
In the quest for increasing and sustaining its competitiveness in GVCs, Colombia still requires policies, capabilities and infrastructure to promote intermediate services

How do sectoral TFP changes in the KIBS sectors propagates to the whole economy?

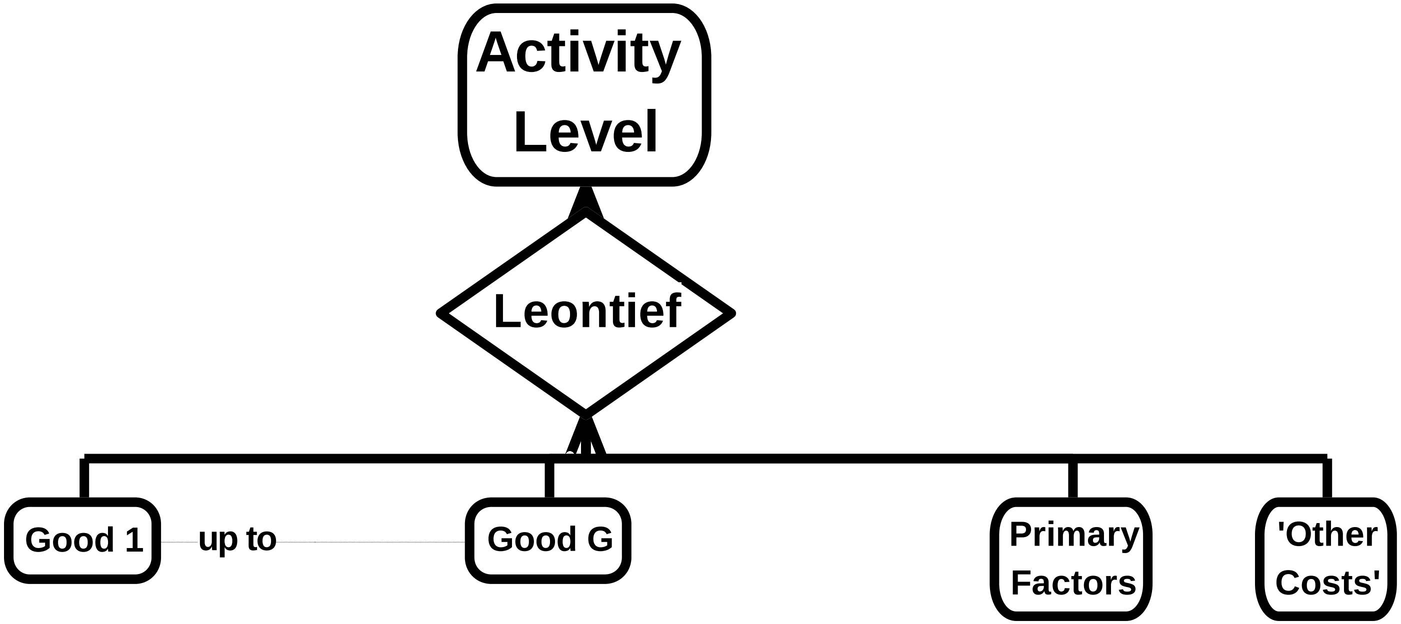


Exports effect relevant, provided relatively large share of sales to exports and/or to export sectors with sufficiently elastic export demand

Our approach:



Top nest of industry inputs



X1TOT(i) =
MIN(All,c,COM: X1_S(c,i)/[A1_S(c,s,i)*A1TOT(i)],
X1PRIM(i)/[A1PRIM(i)*A1TOT(i)],
X1OCT(i)/[A1OCT(i)*A1TOT(i)])

What if TFP in KIBS increased by 1% across the country?

How do we implement KIBS TFP increase?

Which industries affected?

```
Shock a1prim("S46",REGDEST) = uniform -1;
Shock a1prim("S47",REGDEST) = uniform -1;
Shock a1prim("S49",REGDEST) = uniform -1;
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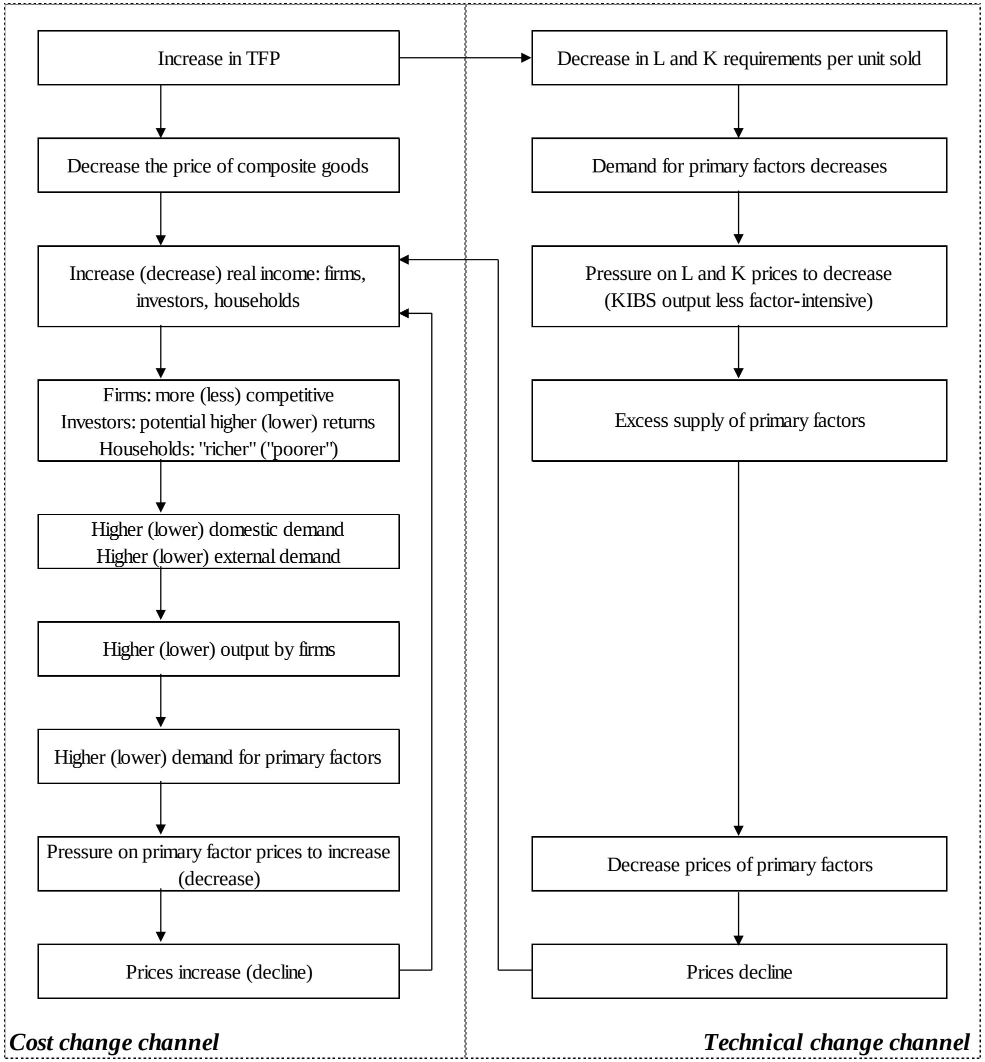
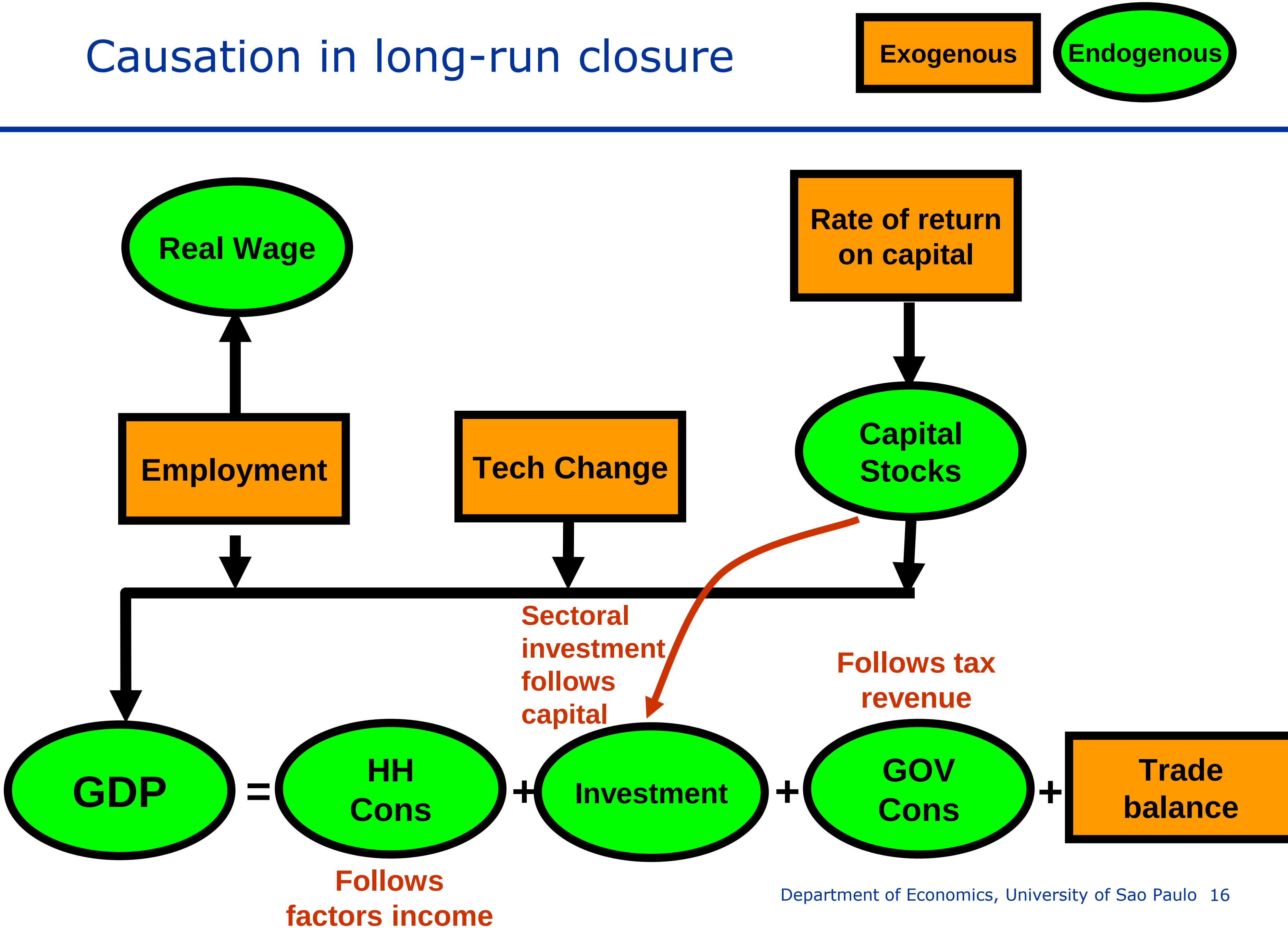
Productivity of primary inputs to production

1% less primary inputs needed to produce same level of output

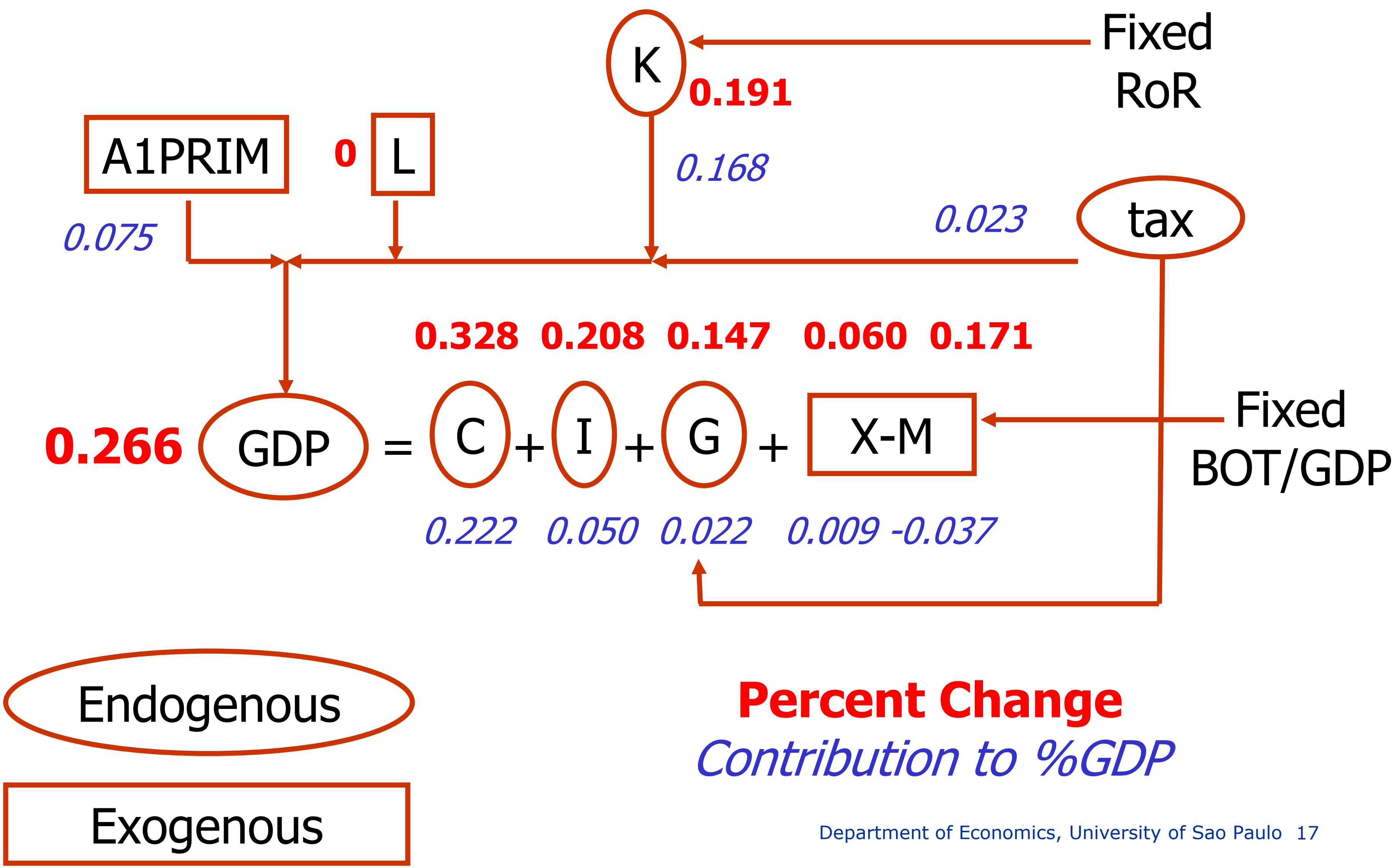
Causal relations underlying the simulation results



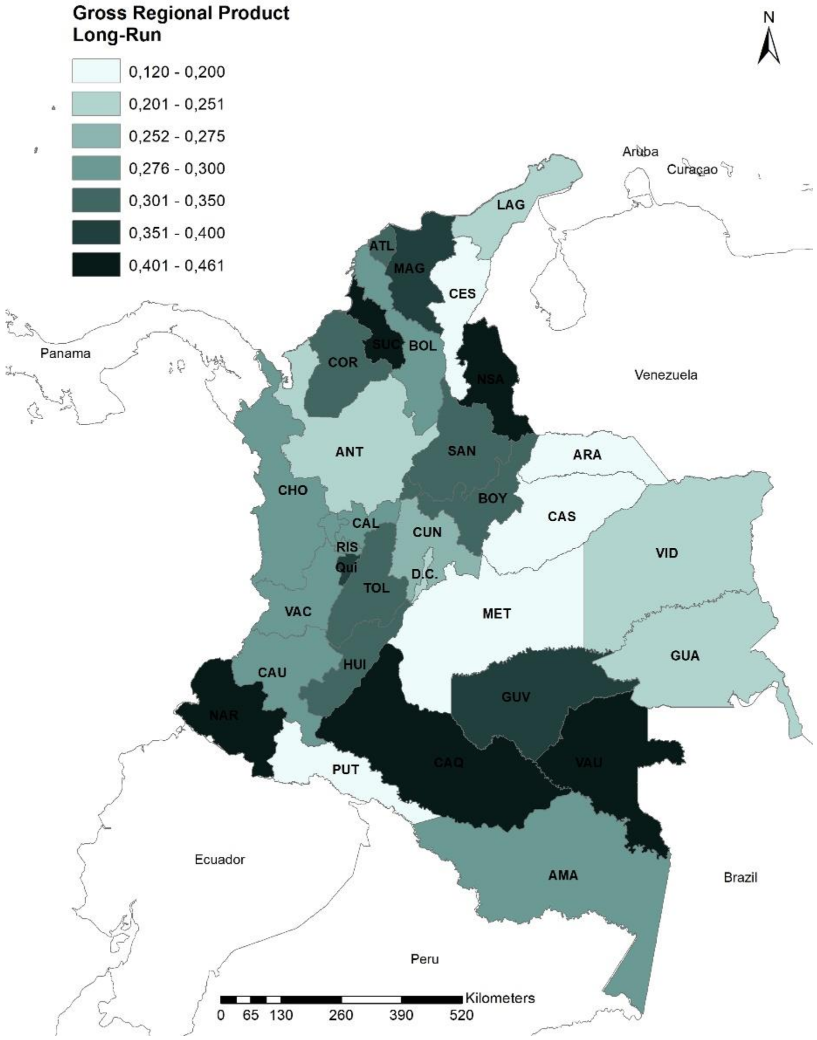
Causation in long-run closure

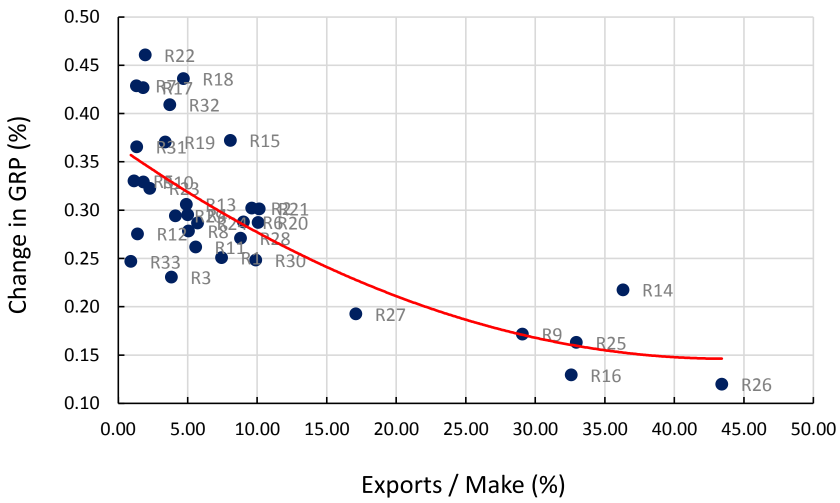


Macroeconomic effects (long-run)



GRP – LR (in percentage change)

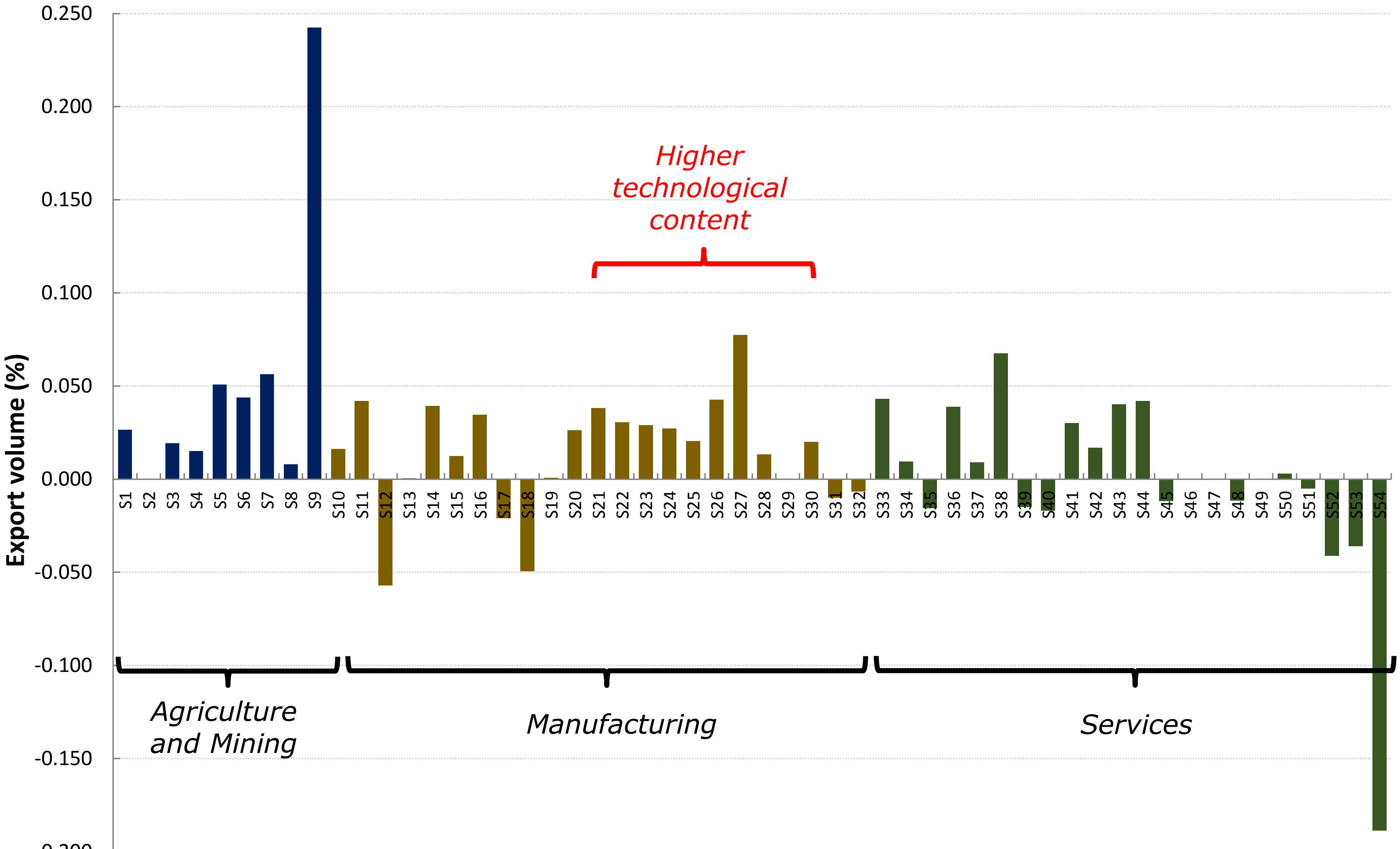




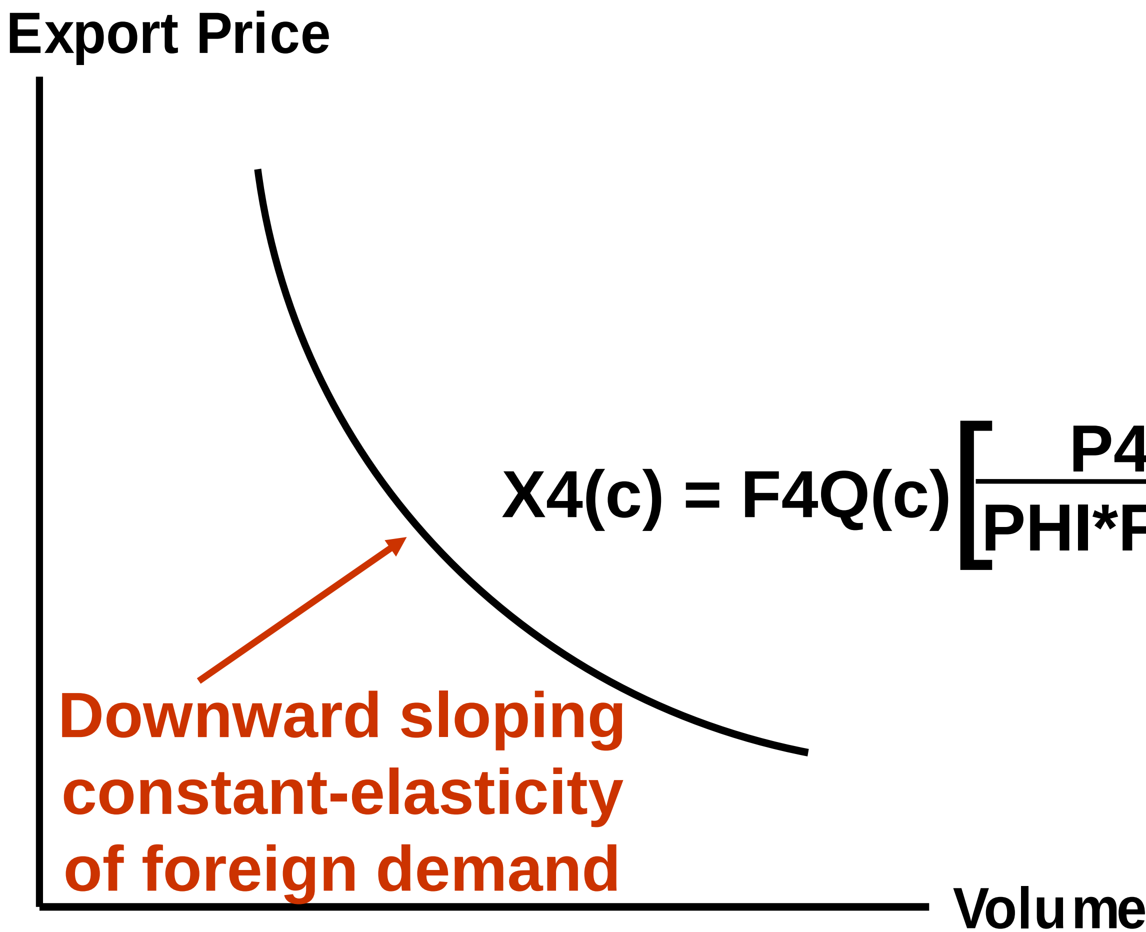
Macro results - LR (in percentage change)

	Total	*Subtotal*		
		S46	*S47*	*S49*
Aggregate primary factor payments	**0.173**	-0.058	0.027	0.204
Aggregate payments to capital	**0.133**	-0.058	0.014	0.177
Aggregate payments to labor	**0.236**	-0.057	0.047	0.245
Real GDP from expenditure side	**0.266**	0.022	0.075	0.169
Aggregate real investment expendiutre	**0.208**	-0.013	0.054	0.166
Real household consumption	**0.329**	0.018	0.104	0.206
Export volume index	**0.060**	0.030	0.020	0.010
Aggregate real government demands	**0.147**	0.008	-0.023	0.162
Import volume index, CIF weights	**0.171**	-0.035	0.038	0.168
Average real wage	**0.363**	0.024	0.116	0.223
Consumer price index	**-0.088**	-0.075	-0.056	0.043
Exports price index, local currency	**-0.104**	-0.049	-0.034	-0.021
Government price index	**-0.087**	-0.081	-0.010	0.004

Sectoral exports (in percentage change)

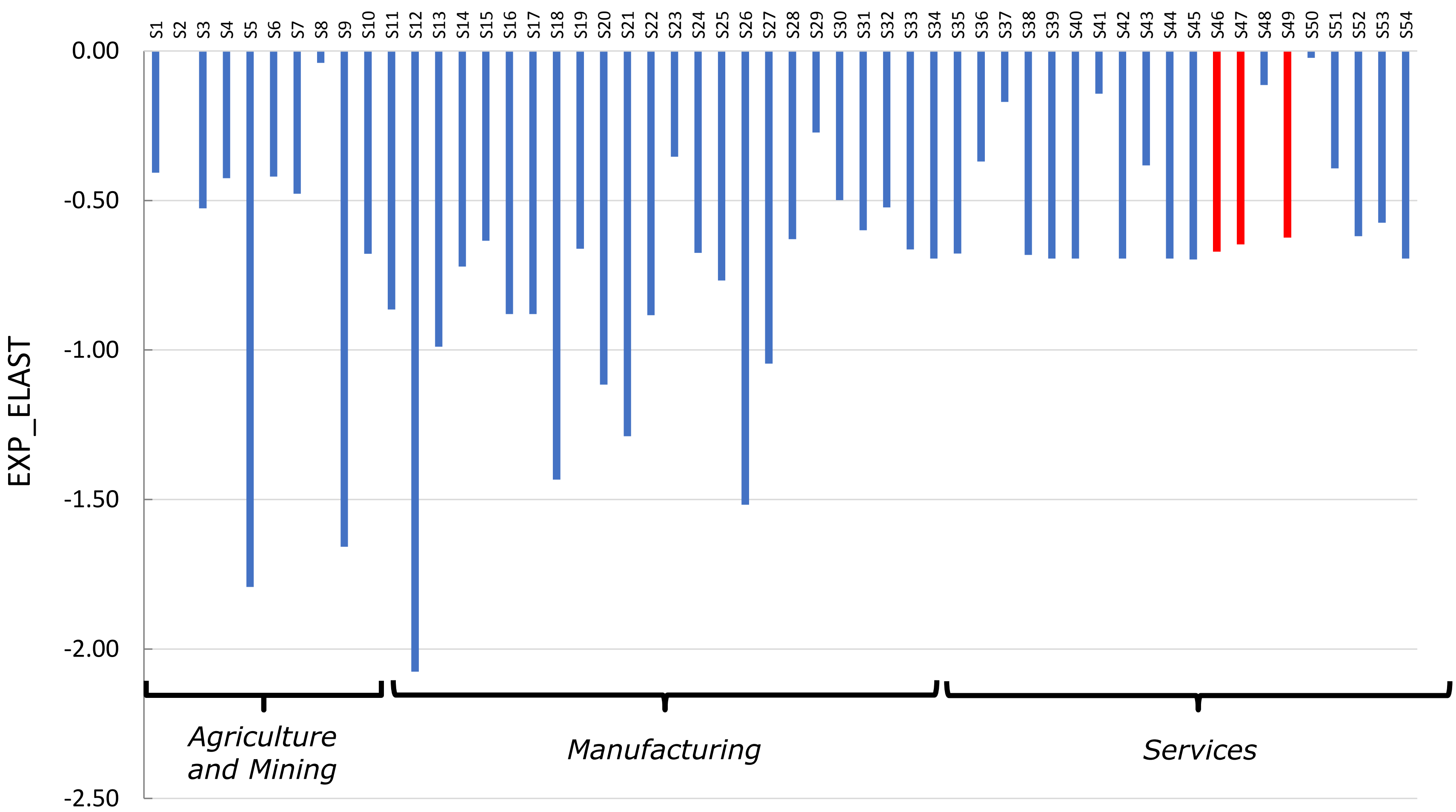


Individual export demand



$$X4(c) = F4Q(c)\left[\frac{P4(c)}{PHI*F4P(c)}\right]^{EXP\_ELAST(c)}$$

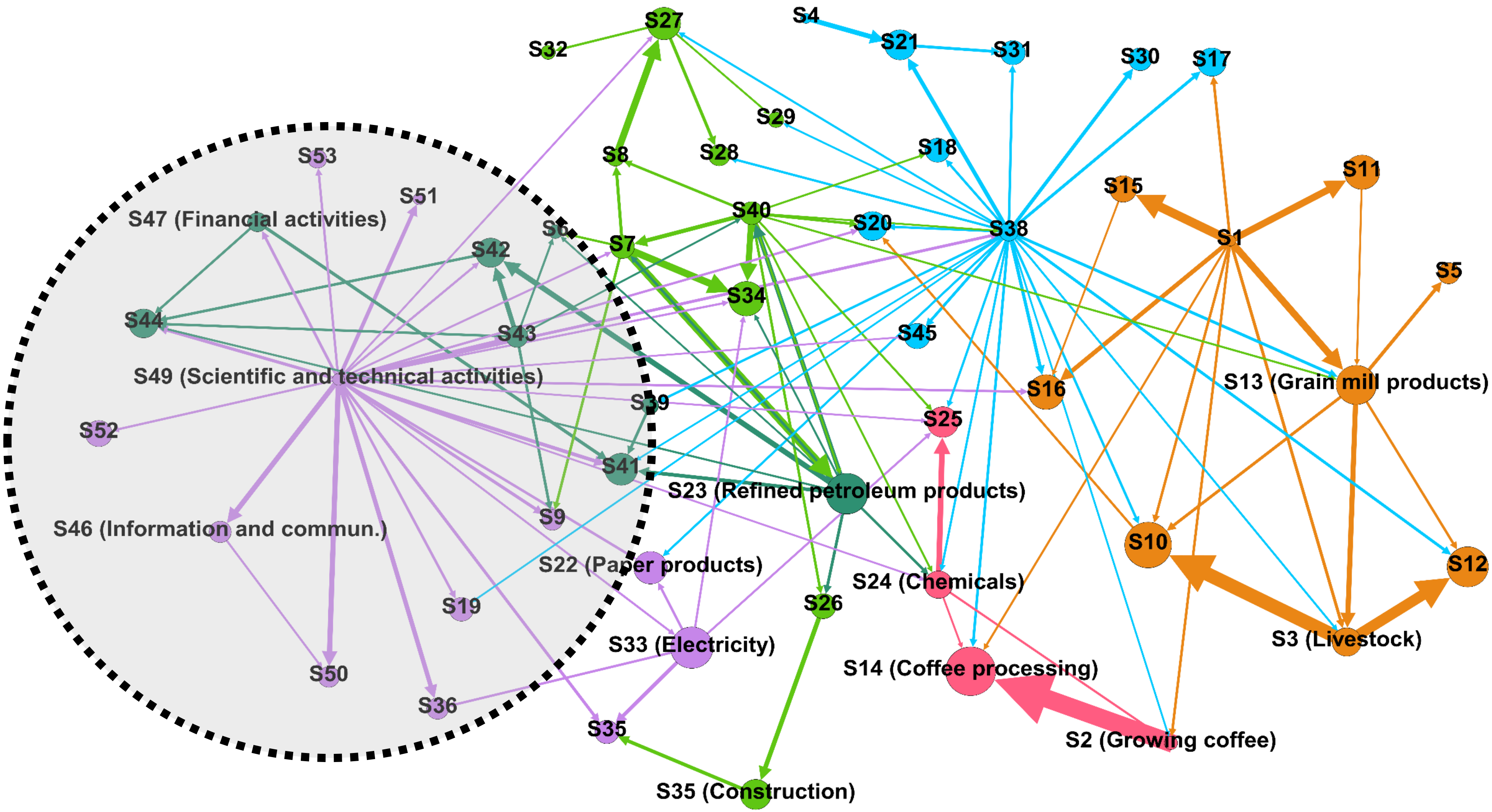
Export demand elasticities – estimates



Aggregate sales pattern of KIBS in Colombia

	Intermediate demand	Investment demand	Household demand	Foreign demand	Government demand
S46	0.565	0.034	0.374	0.025	0.002
S47	0.606	0.003	0.385	0.004	0.003
S49	0.908	0.022	0.042	0.026	0.002
S46+S47+S49	0.722	0.019	0.239	0.018	0.002
Total	0.419	0.115	0.317	0.074	0.075

Input-output network in Colombia

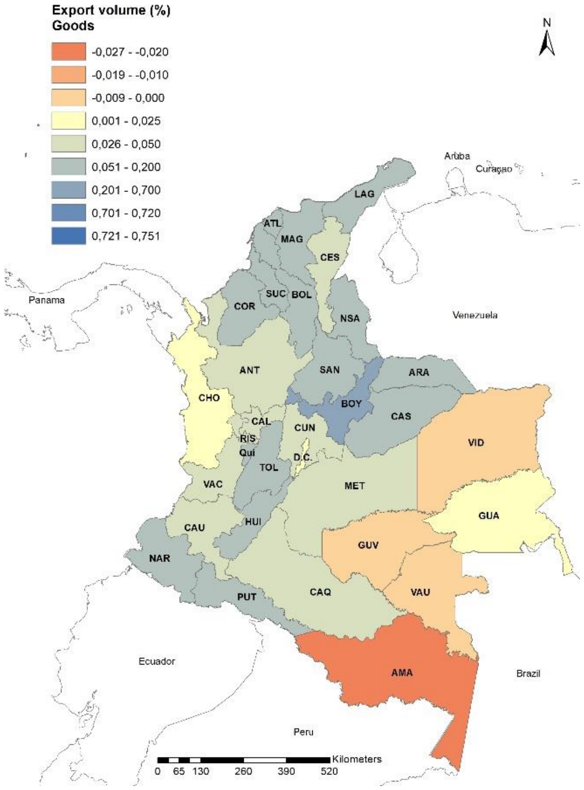


Sectoral exports (in percentage change)

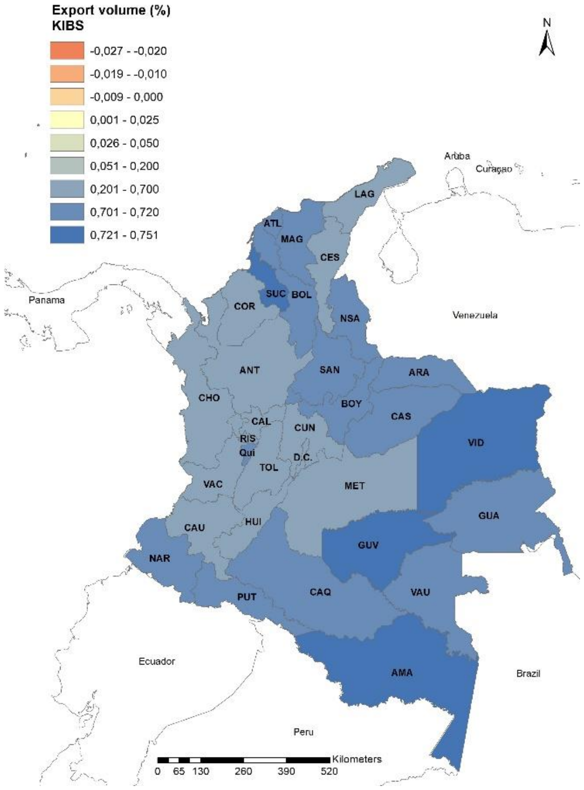
Sector	Total	Subtotal		
		S46	S47	S49
Goods	**0.044**	**0.022**	**0.021**	**0.001**
Services	**0.174**	**0.087**	**0.014**	**0.073**
KIBS	0.685	0.271	0.037	0.377
Others	0.009	0.028	0.007	-0.026
Total	**0.060**	**0.030**	**0.020**	**0.010**

Sectoral exports, by region – LR (in % change)

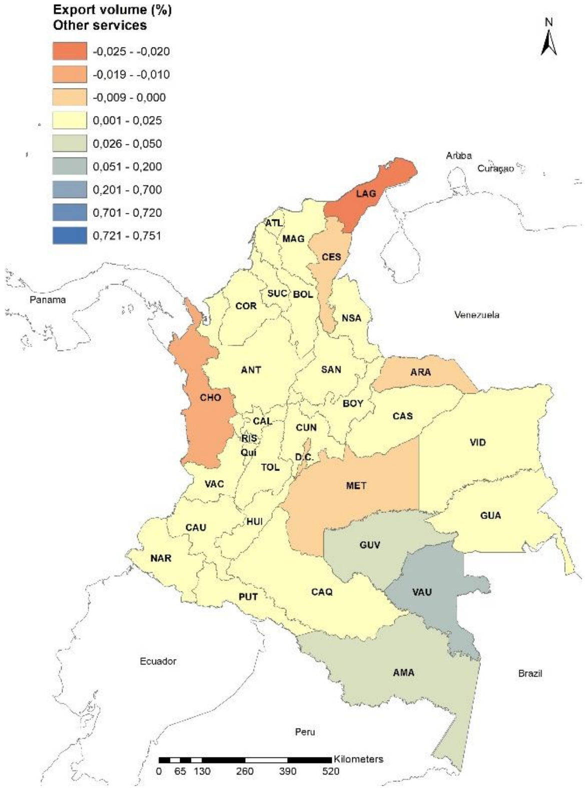
Goods



KIBS

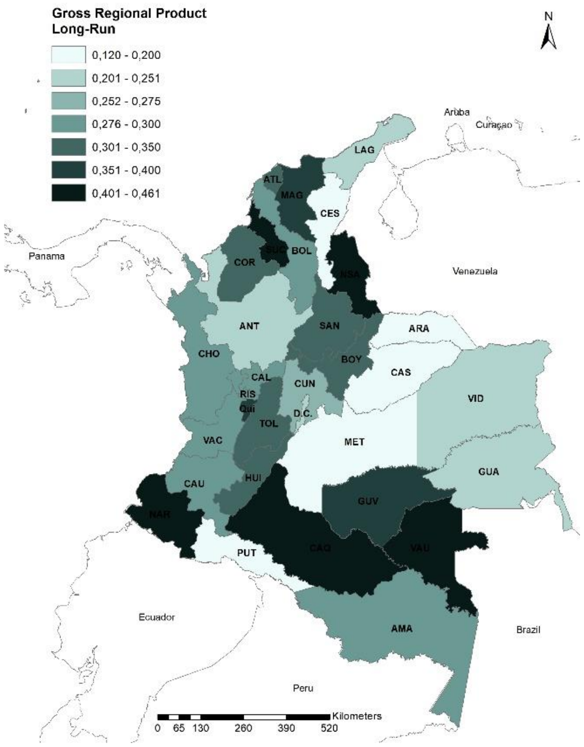


Other services

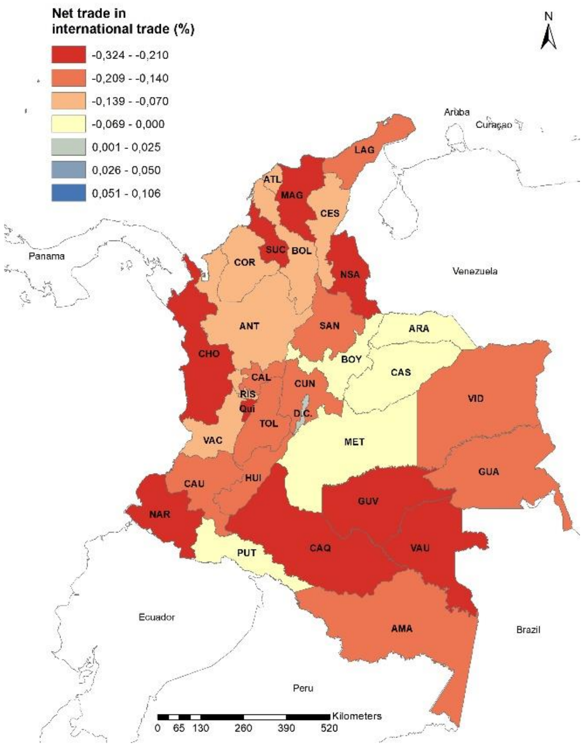


Trade and growth – LR (in % change)

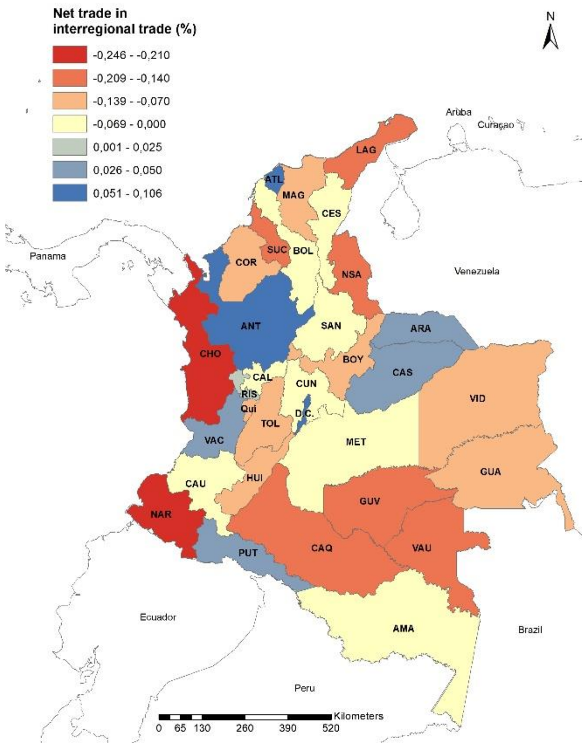
GRP



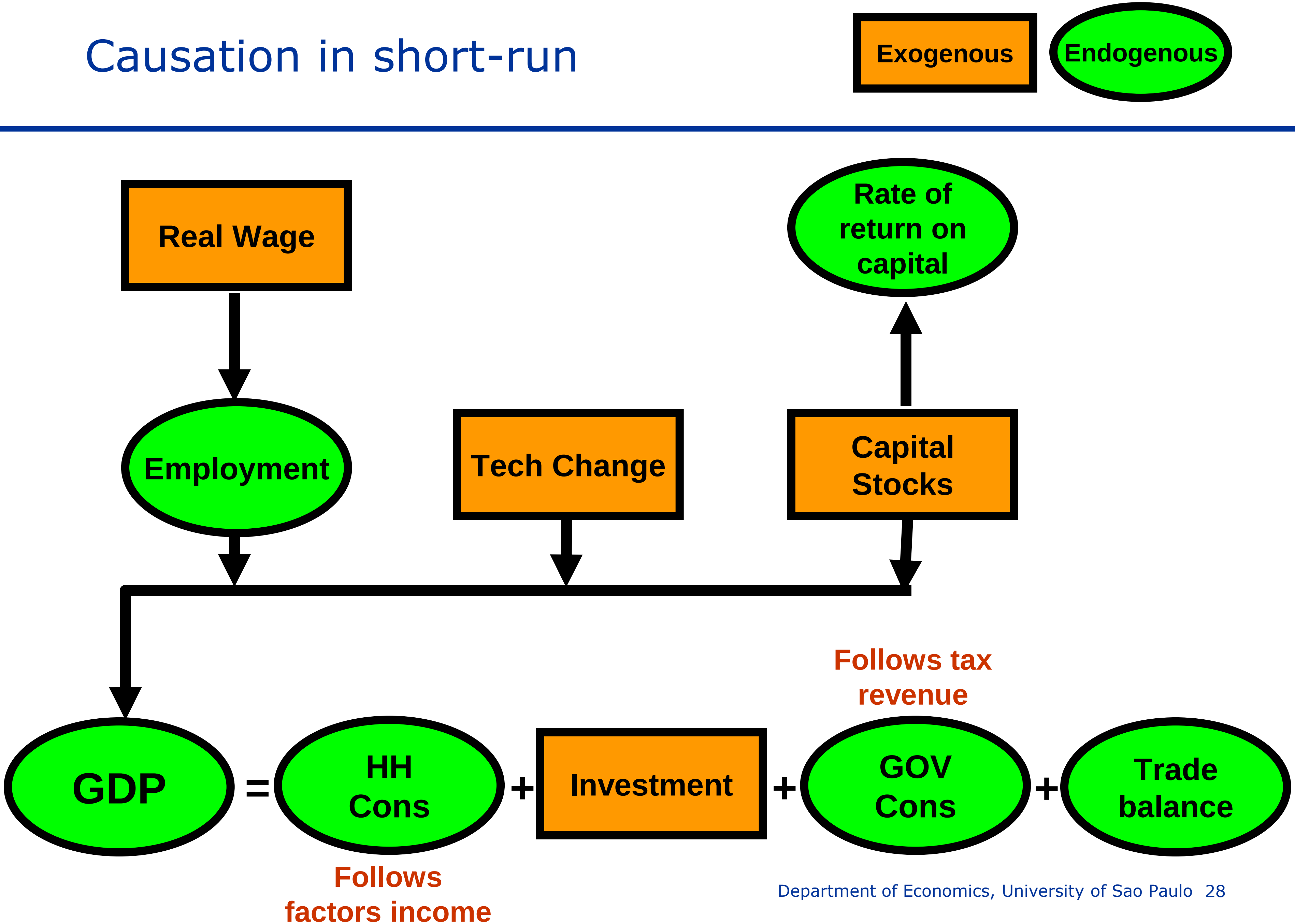
International trade balance



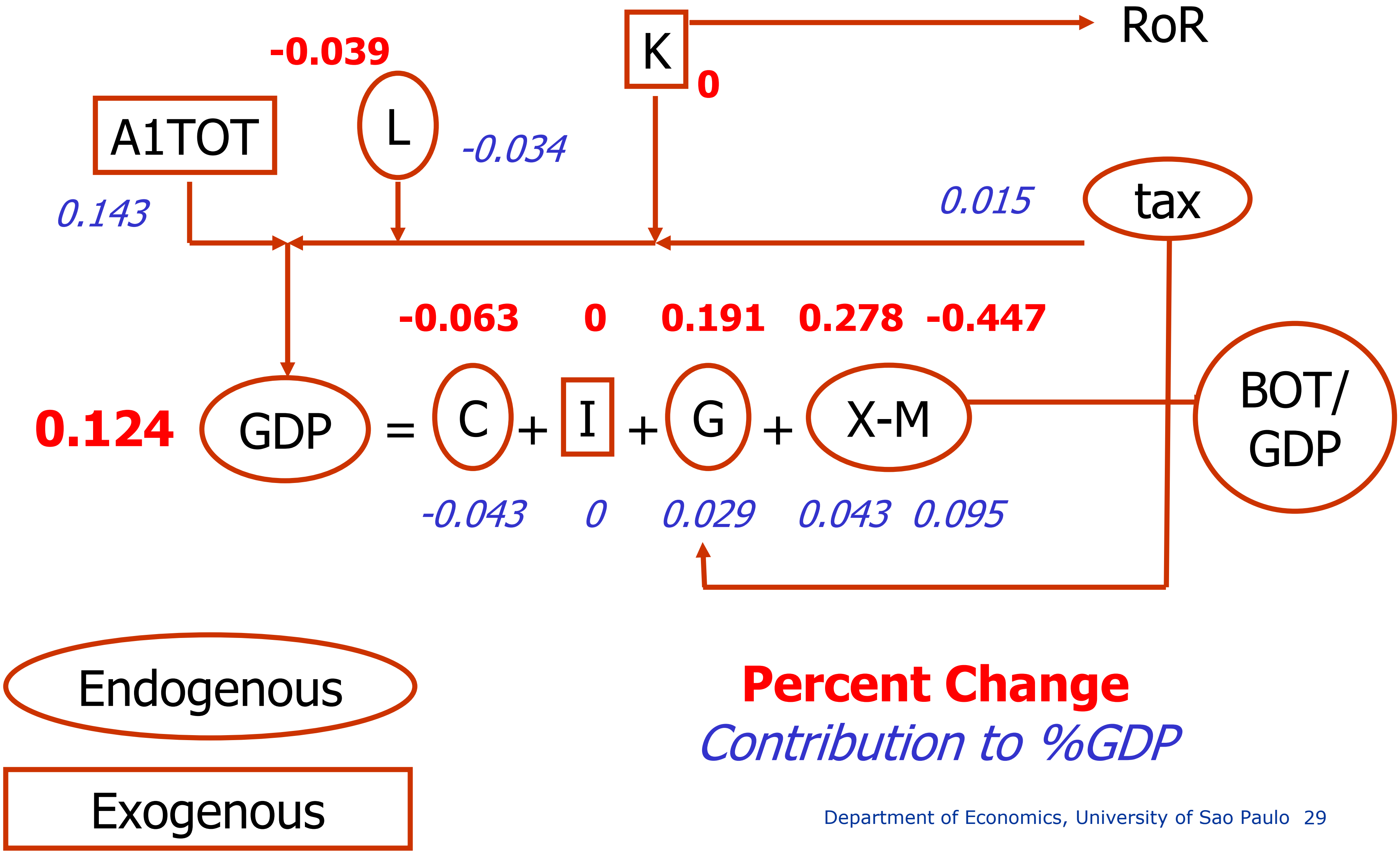
Interregional trade balance



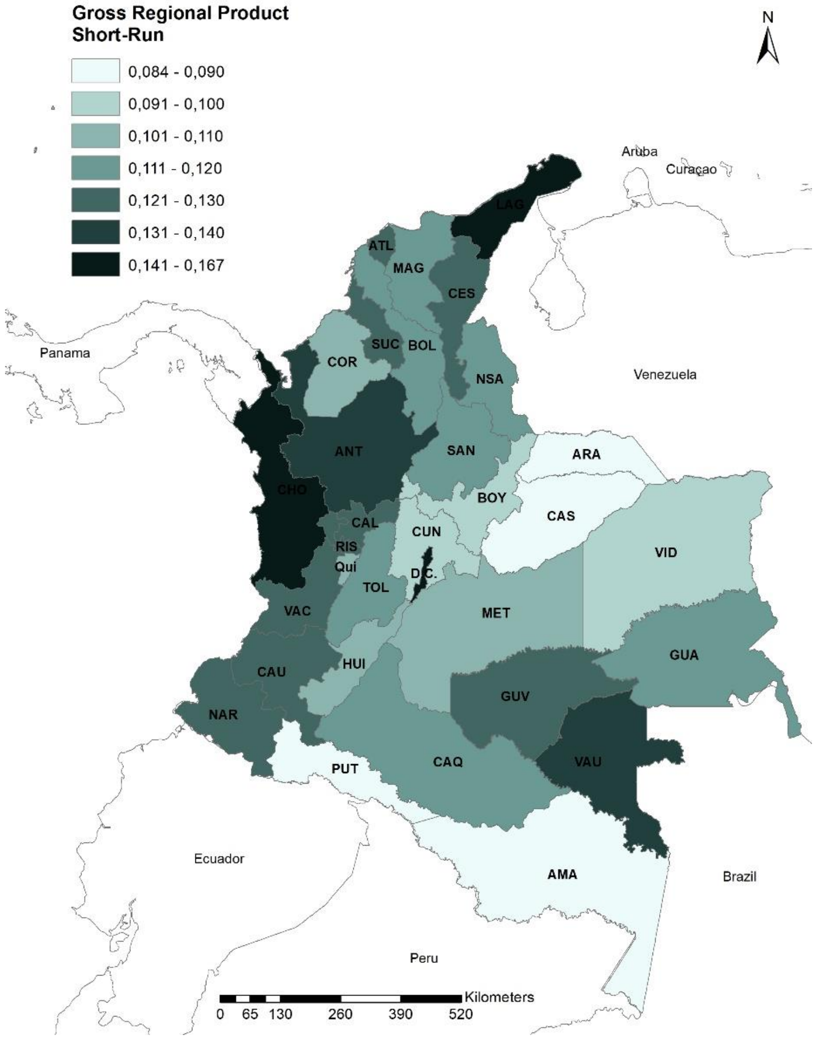
Causation in short-run



Macroeconomic effects (short-run)



GRP – SR (in percentage change)



Macro results - SR (in percentage change)

	Total	*Subtotal*		
		S46	*S47*	*S49*
Aggregate primary factor payments	**-0.864**	-0.125	-0.324	-0.415
Aggregate payments to capital	**-0.802**	-0.120	-0.303	-0.378
Aggregate payments to labor	**-0.962**	-0.134	-0.356	-0.472
Real GDP from expenditure side	**0.124**	0.042	0.042	0.040
Aggregate real investment expendiutre	**0.000**	0.000	0.000	0.000
Real houselhold consumption	**-0.063**	0.023	-0.008	-0.078
Export volume index	**0.278**	0.045	0.094	0.139
Aggregate real government demands	**0.191**	0.039	-0.008	0.159
Import volume index, CIF weights	**-0.447**	-0.062	-0.161	-0.223
Average real wage	**0.000**	0.000	0.000	0.000
Consumer price index	**-0.903**	-0.158	-0.350	-0.395
Exports price index, local currency	**-0.437**	-0.070	-0.148	-0.219
Government price index	**-1.098**	-0.179	-0.355	-0.563

Final remarks

Competitiveness of firms in open economies is increasingly determined by access to low-cost and high-quality producer services

Effects of TFP-growth of KIBS on goods exports are more relevant for mining and medium and medium-high technology manufacturing activities in Colombia

Factor income effects are **stronger in the long-run**, generating stronger impacts on domestic absorption *vis-à-vis* foreign exports

- Exports effect less relevant due to relatively small share of KIBS sales to exports (direct effect) and to export sectors with relatively inelastic export demand (indirect effect)

"Servicification" has potential asymmetric locational impacts, benefiting primate cities/regions, at the national level

Next steps (room for collaboration)

Sensitivity analysis with export demand elasticities

Climate change implications of non-service activities on KIBS

- Role of KIBS to promote a “green economy”
- Colombian exports of goods
  - Fossil fuel (changes in the world energy matrix)
  - Agriculture (productivity and geographical shifts)

Assessment of policies linked to services’ content shares and services’ trade facilitation thet may lead to the removal of important trade frictions, helping increasing competitiveness, productivity and well-being

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