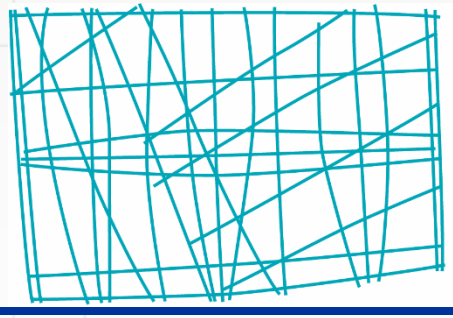


NEREUS

Núcleo de Economia Regional e Urbana da Universidade de São Paulo

The University of São Paulo Regional and Urban Economics Lab

BANCO DE LA REPÚBLICA

CENTRO DE ESTUDIOS ECONÓMICOS REGIONALES (CEER) - CARTAGENA

Impact Assessment of Scenarios of Interregional Transfers in Colombia

VII Jornada Iberoamericana de Financiación Local
Cartagena, Colombia, September 5-6, 2018

Eduardo Haddad Luis Galvis Inácio Araújo-Júnior Vinicius Vale

Regional disparities in Colombia

- Inequalities in Colombia have been documented to be persistent over time (Bonet and Meisel, 2001; Galvis and Meisel, 2010).

- For instance, Galvis et al. (2017) have found a high correlation between the literacy rates in 1912 compared to the ones in other years for which there is a Census available.

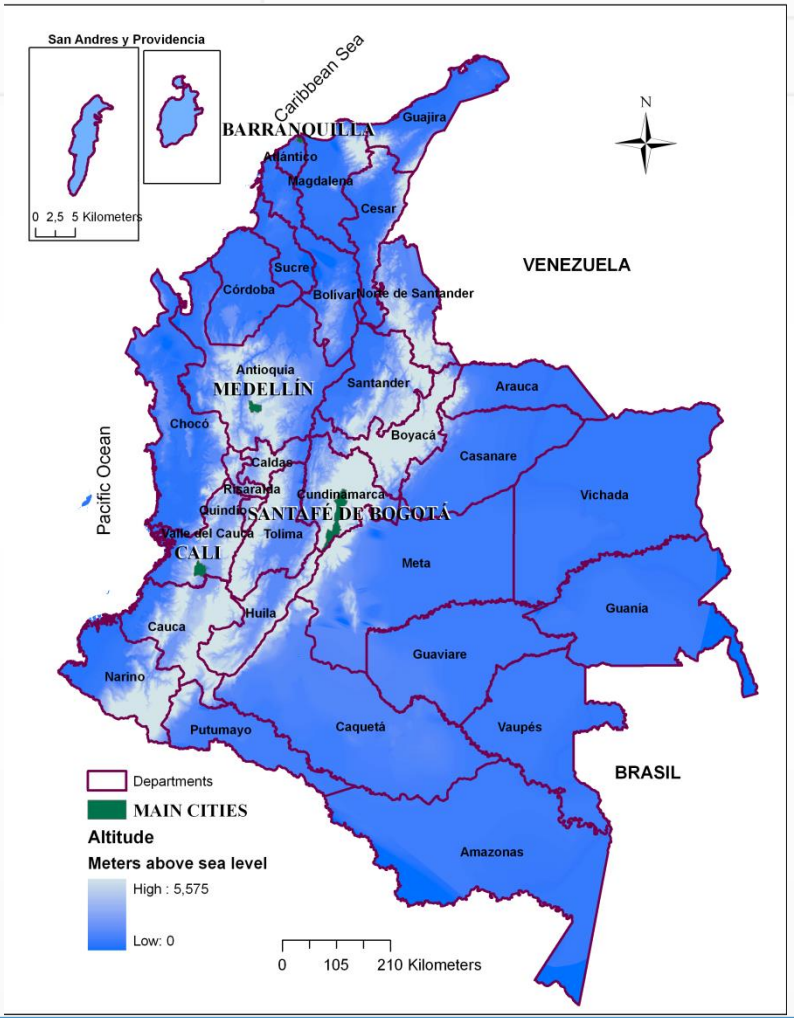
- Strong evidence of the persistence of poor conditions in the population since various decades in the past.

- There is also evidence of **regional disparities** in those characteristics.

- For instance, the Pacific region shows consistently lower living standards than the rest of the country.

In terms of poverty rates there are notable differences

- Bogota: Poverty rate is 9.1%
- “Golden Triangle” Bogota-Cali-Medellin: 15%
- Caribbean Coast: 45.4%
- Pacific Coast: 47.9%



Instruments to reduce spatial economic disparities

- One of the available instruments to reduce spatial economic disparities is **fiscal equalization policies** (Albouy, 2012; Rodriguez-Pose, 2018).

- Goal: redistribute tax revenues from areas with high financial capacity to poorer regions, and thus allowing lagging regions to offer more public goods (Henkel et al., 2018).

- Fiscal equalization strategies are **used in different countries**, both in the developed and developing worlds: Germany (Juben, 2006; Buettner, 2009; Baskaran et al.; 2017), USA (Buchnan, 1950; Kline and Moretti, 2014; Austin et al., 2018), Australia (Groenewold et al., 2003; Groenewold and Hagger, 2007), Japan (Otsuka et al., 2010), OECD countries (Kyriacou et al., 2015 and 2016), and Brazil (Haddad et al., 2013).

Colombia

- The structure of government in Colombia is comprised by three tiers: the central government, the departments (32 units plus Bogota) and the municipalities (1,122 units).

- In Colombia, transfers from the Central National Government (CNG) are targeted to alleviate the problems of the lack of resources in the periphery.

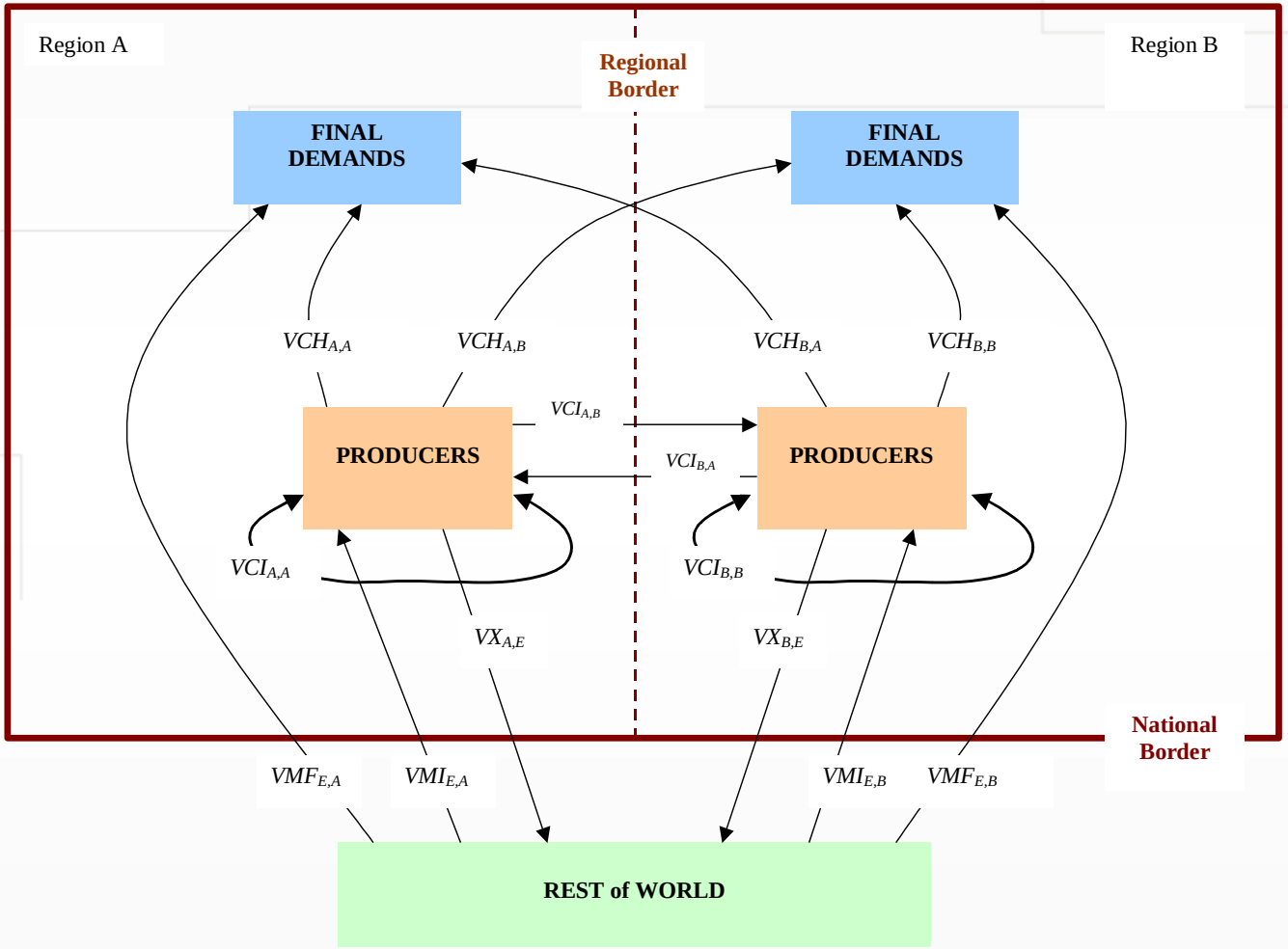
- We do not have enough evidences about the implications of fiscal transfers for the Colombian economy.

- Thus, in order to address this issue, we calibrate an interregional general equilibrium model for Colombia (CEER model) and simulate different counterfactual scenarios related to the distribution of interregional transfers.

CEER, a bottom-up spatial CGE model of Colombia

- A multi-sectoral, multi-regional bottom-up CGE model of Colombia's 32 Departments and the capital city, Bogotá
  - each region is modeled as an economy in its own right
  - region-specific prices
  - region-specific industries
  - region-specific consumers
- Based on the comparative-static B-MARIA and MMRF models
- Database makes allowance for interregional, intra-regional and international trade
  - explicit representations of regional and Central government financial accounts

Stylized flows



Simulation design

1. Benchmark values

i. Regionalized government expenditures in the database

ii. Intergovernmental transfers informed by the CEER team

2. Reallocate estimated transfers for each department according to different parameters

   i. Scenario 1: Regional share in national population

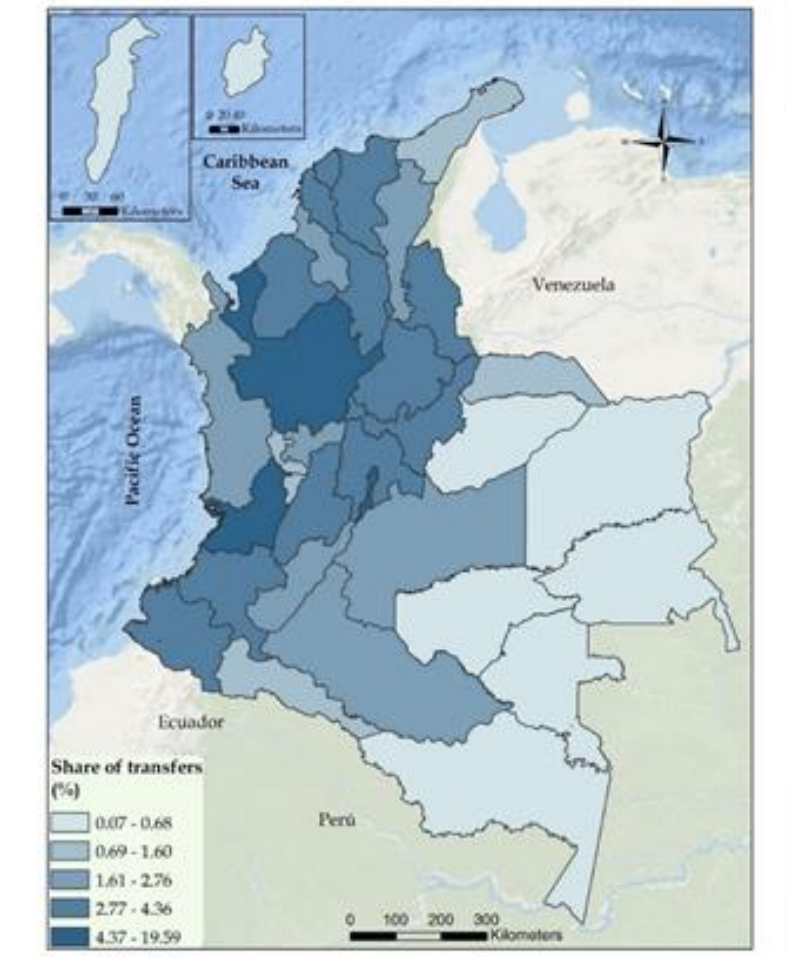
   ii. Scenario 2: “Extreme poverty”

   iii. Scenario 3: “Fiscal gap”

3. Calculate the size of the “shock” in the variable *f5gen* according to each redistribution schemes

4. Use two closures: short run and **long run**

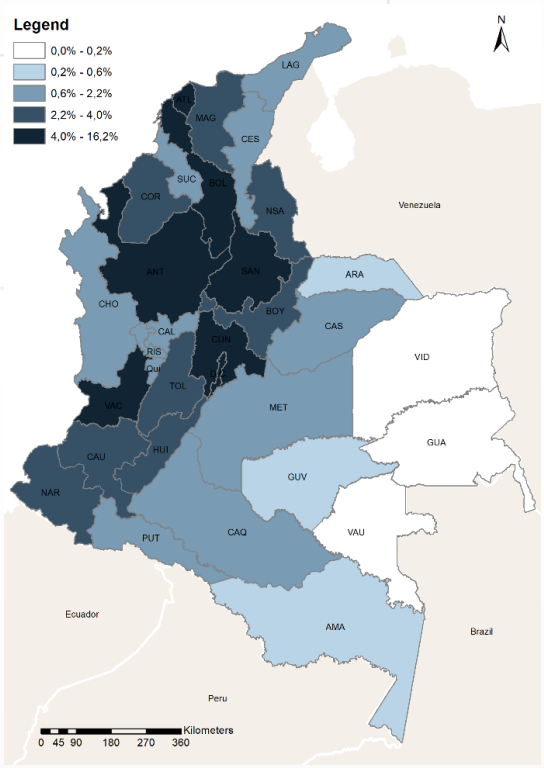
Benchmark shares of transfers from the Central Government



Simulated shares of transfers from the Central Government

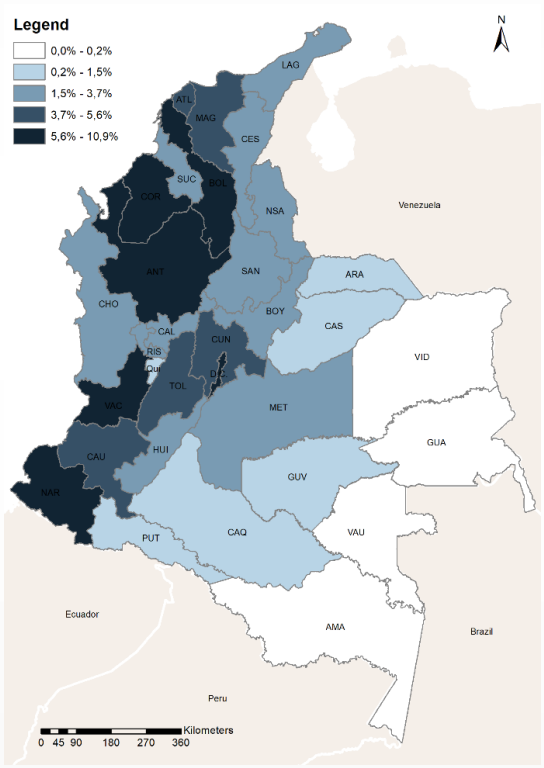
(a)

Population share



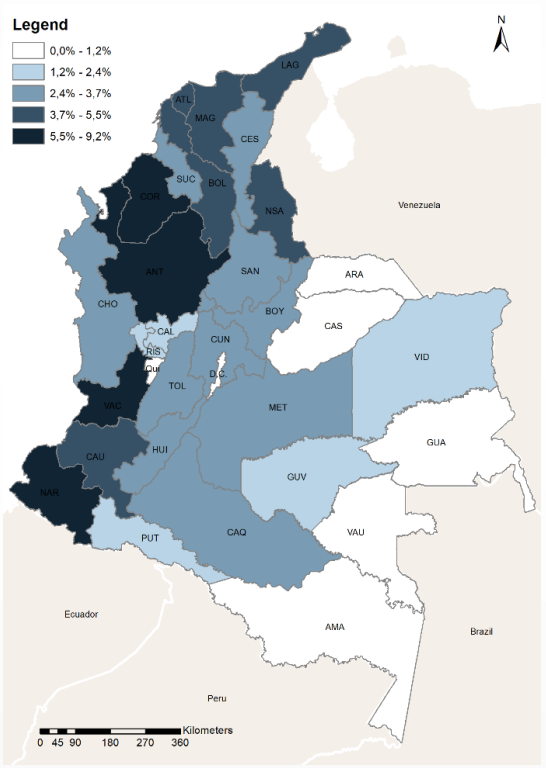
(b)

Extreme poverty share



(c)

Fiscal gap share



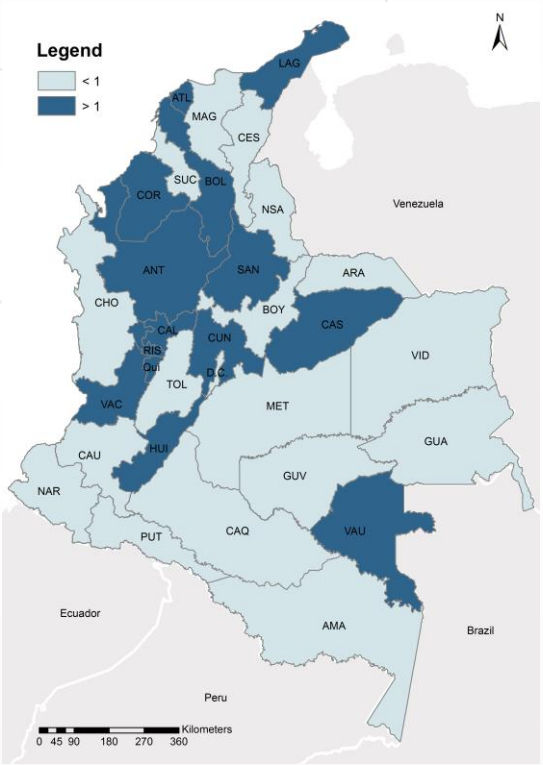
Simulated shares of transfers from the Central Government

Region	Department	%Transfer	%Pop	%Poverty	%Fiscal Gap
D1	Antioquia	8.647	13.357	10.941	9.198
D2	Atlántico	3.492	5.095	5.289	4.538
D3	Bogotá, D.C.	19.593	16.254	5.770	0.000
D4	Bolívar	4.254	4.348	5.880	5.102
D5	Boyacá	3.186	2.729	2.971	3.042
D6	Caldas	1.801	2.109	2.280	2.080
D7	Caquetá	2.268	0.986	1.269	3.336
D8	Cauca	3.142	2.882	5.470	5.102
D9	Cesar	2.159	2.129	3.049	3.434
D10	Chocó	2.010	1.042	2.166	3.017
D11	Córdoba	3.398	3.505	6.457	5.740
D12	Cundinamarca	4.360	5.491	3.915	2.845
D13	La Guajira	1.422	1.877	3.351	3.949
D14	Huila	2.042	2.387	3.317	3.189
D15	Magdalena	2.909	2.627	4.204	4.391
D16	Meta	2.150	1.947	1.756	3.164
D17	Nariño	4.025	3.608	5.607	6.034
D18	Norte de Santander	2.969	2.835	3.501	3.949
D19	Quindío	1.105	1.193	1.418	1.165
D20	Risaralda	1.599	2.009	1.747	1.791
D21	Santander	3.529	4.360	2.768	2.698
D22	Sucre	2.761	1.775	2.794	3.360
D23	Tolima	3.939	2.997	3.876	3.262
D24	Valle del Cauca	8.841	9.605	7.894	5.617
D25	Amazonas	0.292	0.158	0.128	0.952
D26	Arauca	0.969	0.544	0.441	1.030
D27	Casanare	0.683	0.725	0.587	1.060
D28	Guainía	0.146	0.085	0.069	0.760
D29	Guaviare	0.502	0.228	0.185	1.381
D30	Putumayo	1.257	0.715	0.579	1.678
D31	Archipiélago de San Andrés	0.132	0.160	0.130	0.000
D32	Vaupés	0.068	0.091	0.074	0.780
D33	Vichada	0.350	0.144	0.116	2.355

Net transfers gainers (>1) and losers (<1)

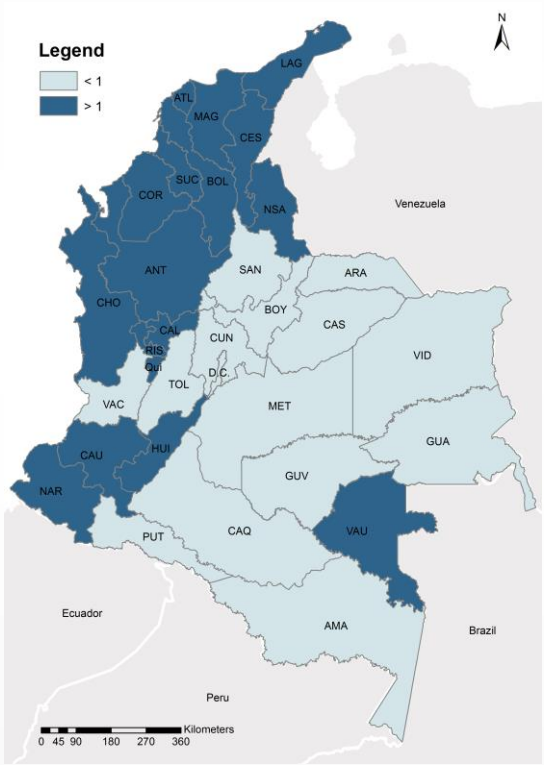
(a)

Scenario 1: population share



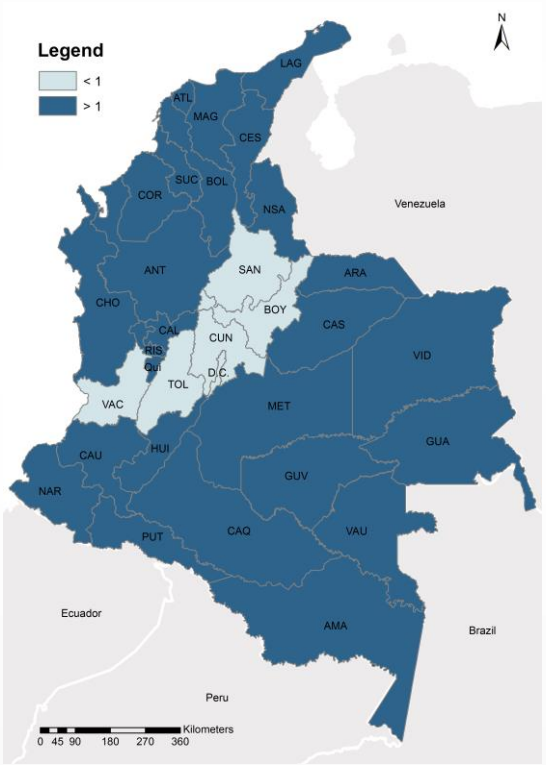
(b)

Scenario 2: extreme poverty share



(c)

Scenario 3: fiscal gap share



Interpretation of the results

- Results are in percentage changes from the benchmark values

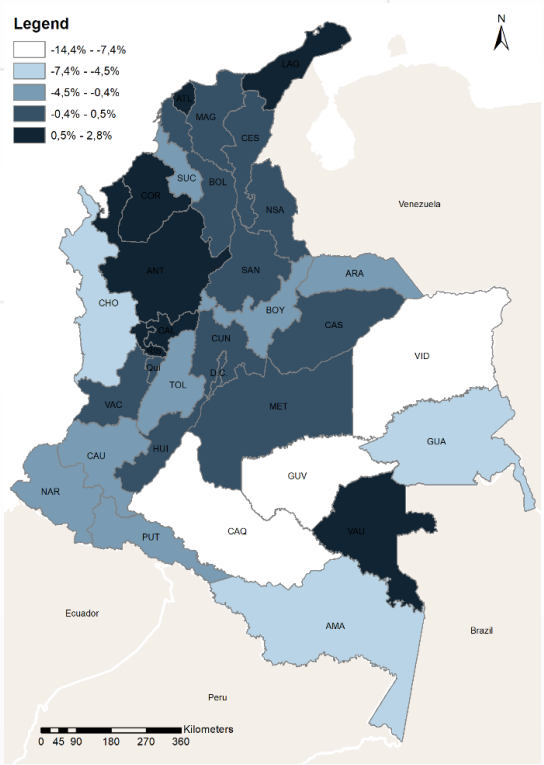
- Attention!
  - Since the benchmark reflects the prevailing intergovernmental transfers scheme, the counterfactuals simulations represent alternative redistributive scenarios (e.g. based on population, poverty or fiscal gap)

- *What if existing transfers (SGP) were redistributed according to regional population, regional poverty or regional fiscal gap?*

Effect on Gross Regional Product – short run

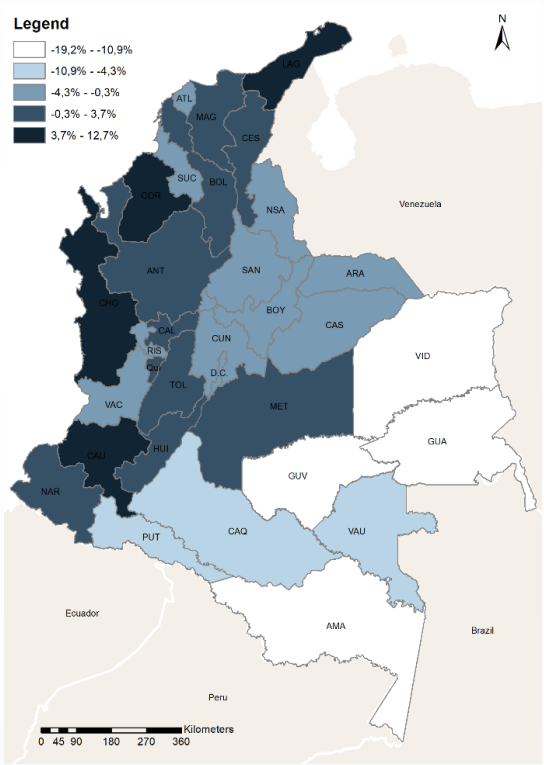
(a)

Scenario 1: population share



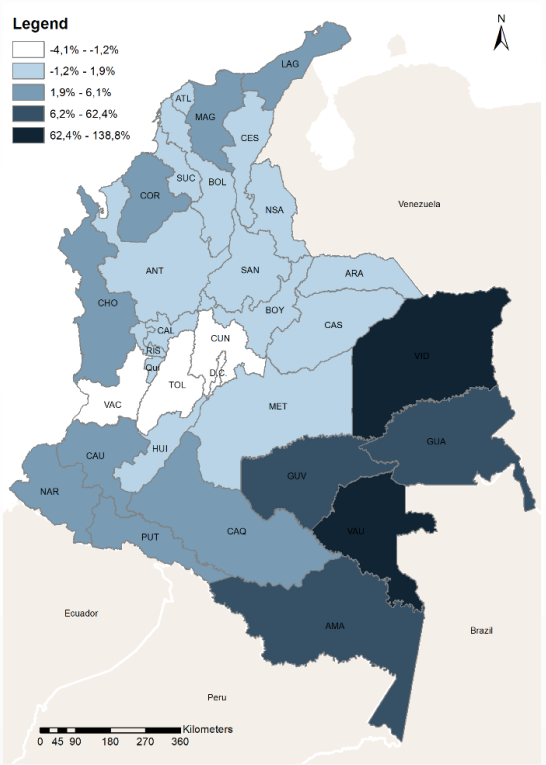
(b)

Scenario 2: extreme poverty share



(c)

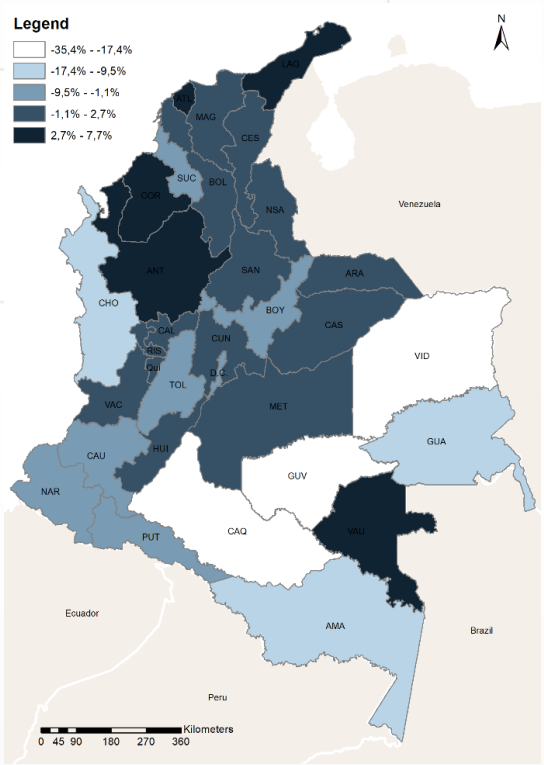
Scenario 3: fiscal gap share



Effect on Gross Regional Product – long run

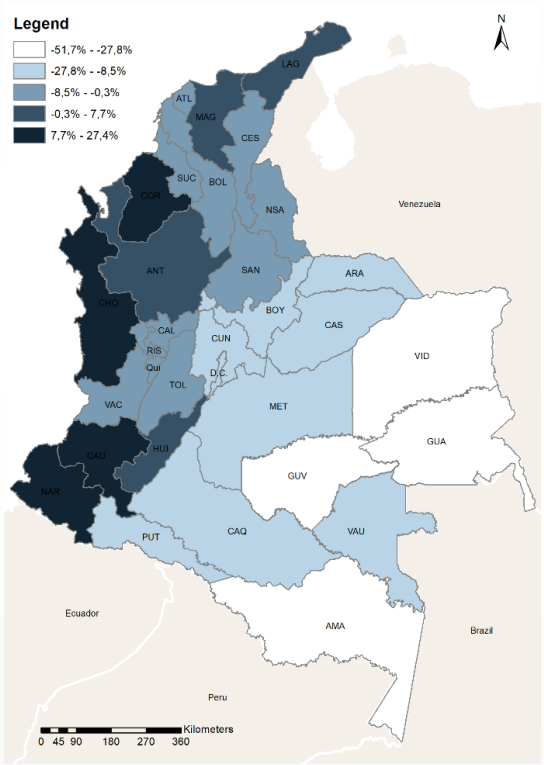
(a)

Scenario 1: population share



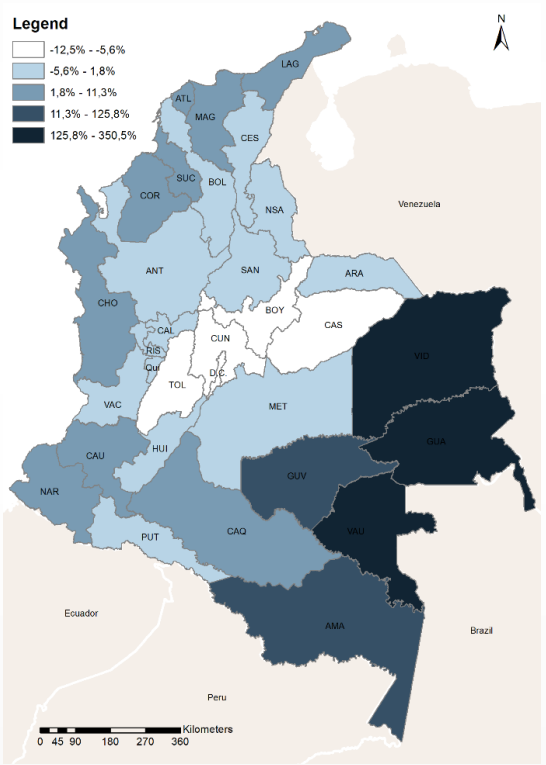
(b)

Scenario 2: extreme poverty share

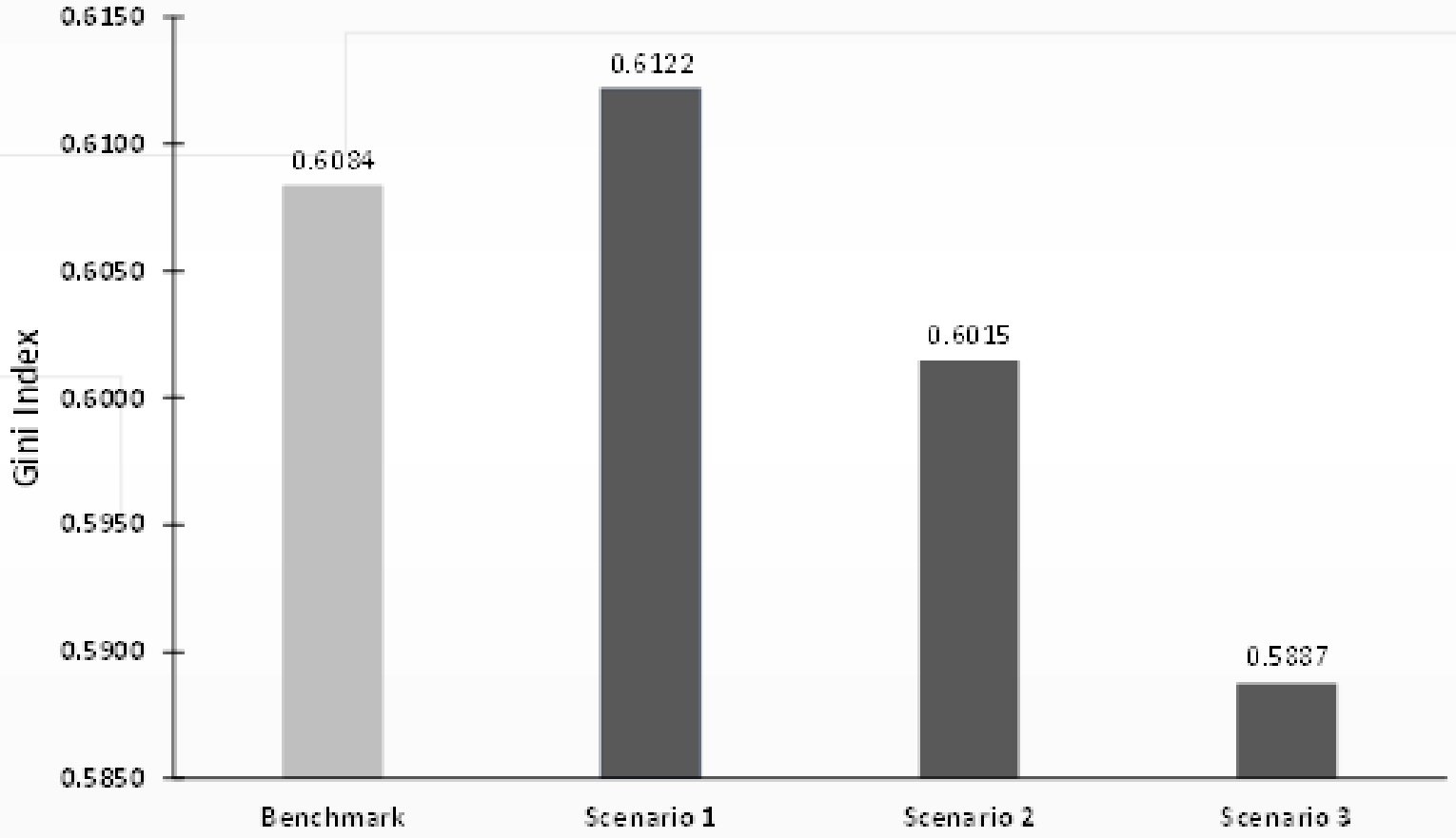


(c)

Scenario 3: fiscal gap share



Locational Gini Index under the alternative scenarios – long run



Long-run effects under the alternative scenarios (in % change)

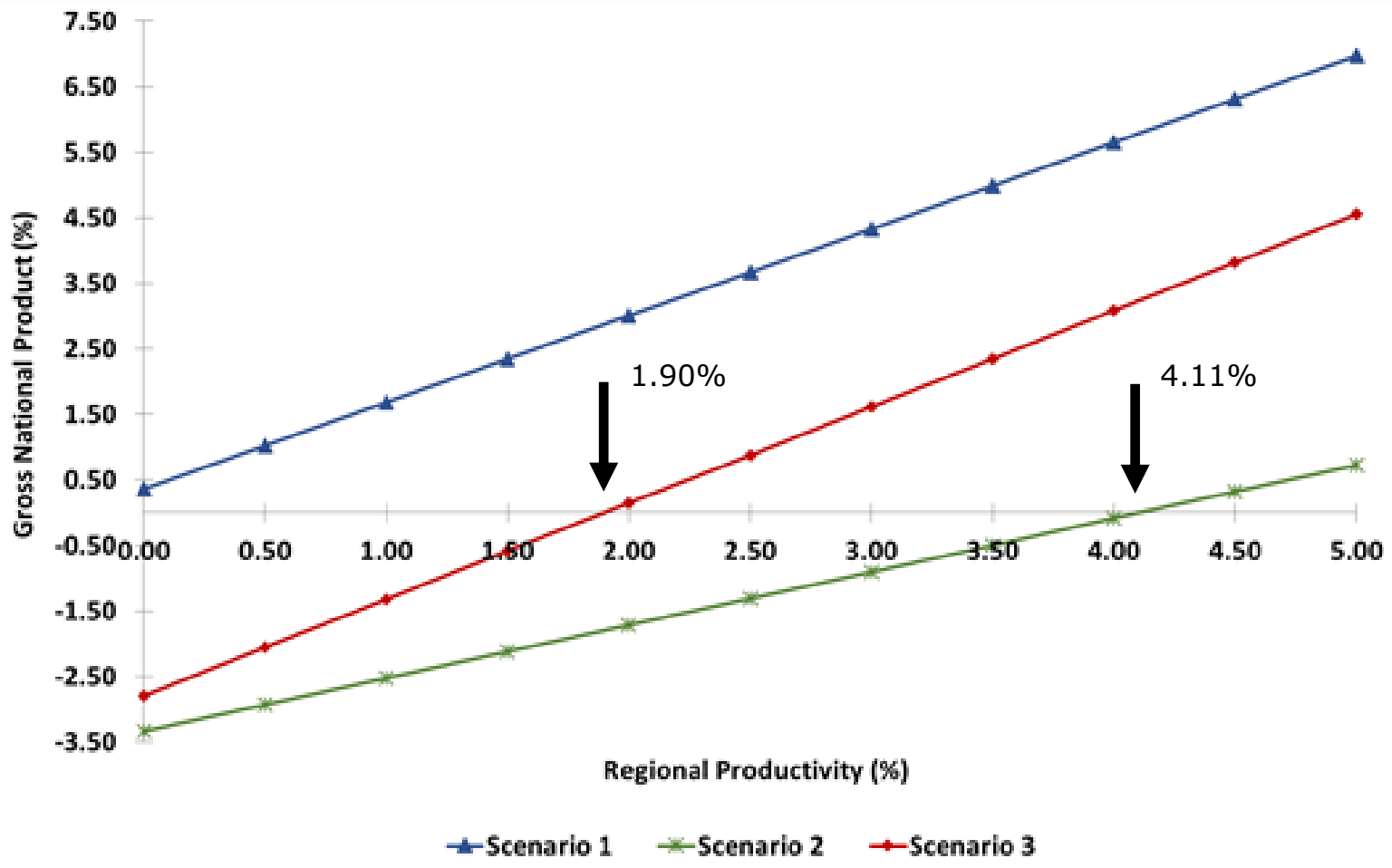
Scenario	Real GDP	Locational Gini Index	Relative Equivalent Variation
(1) Population	0.358	0.625	-0.014
(2) Extreme poverty	-3.339	-1.134	0.100
(3) Fiscal gap	-2.787	-3.238	0.041

Note: Relative equivalent variation is measured by the ratio of the equivalent variation to pre-shock regional household disposable income.

What if the additional resources stimulated productivity gains in the receiving regions?

- Impacts on real national GDP
  i. Scenario 1: “Population share” **(+)**
  ii. Scenario 2: “Extreme poverty” **(-)**
  iii. Scenario 3: “Fiscal gap” **(-)**
- Additional financial resources could induce TFP growth in regions that face gains
- Need to associate additional transfer resources to regional TFP growth (additional shocks to *a1prim*)
  - ➢ Uniform shocks in regions that face gains

Threshold for regional TFP growth that offsets national GDP loss



Results

- Weighted (value added weights) aggregate TFP in Colombia:

  i. Scenario 1: **-**

  ii. Scenario 2: **0,67%**

  iii. Scenario 3: **2,13%**

The role of agglomeration economies

- Increasing returns in the manufacturing sector in Bogotá and Cundinamarca, the richest, most industrialized region in Colombia and for which there is evidence that it is the focal point of agglomeration economies in the country (Haddad et al. 2009).

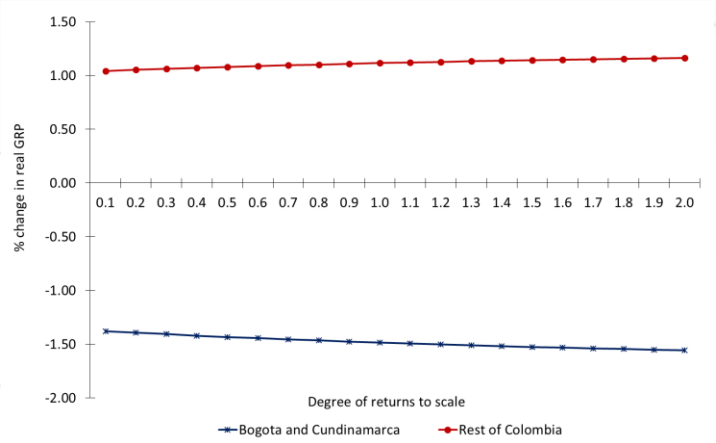
- Test the sensitivity of our results related to the parameter specification

- Hypothetically varied the values for the parameter measuring returns to scale in the Bogotá-Cundinamarca. We assume constant returns in every sector in every region. The only exception is the manufacturing sector in Bogotá and Cundinamarca, for which we consider an interval in the increasing returns to scale (IRTS) curve, ranging from high increasing returns to decreasing returns to scale in the manufacturing sector.

Sensitivity Analysis: effects on gross regional product (GRP) in the long-run

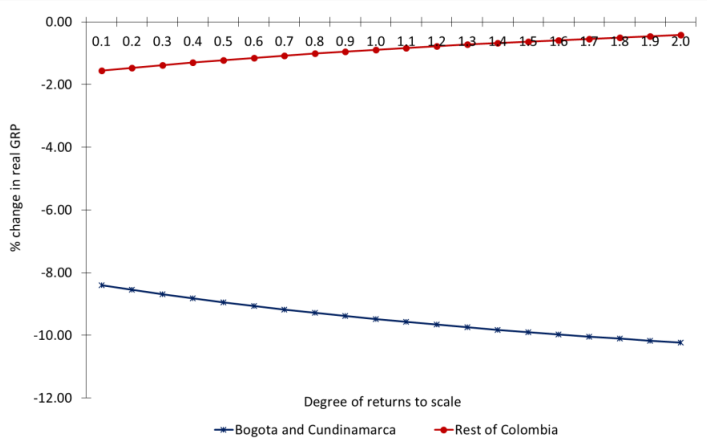
(a)

Scenario 1 (population)



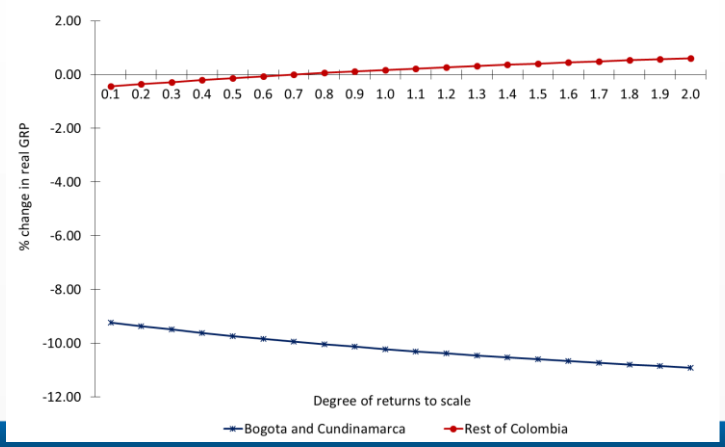
(b)

Scenario 2 (extreme poverty)



(c)

Scenario 3 (fiscal gap)



Final remarks

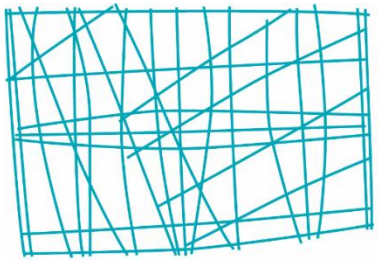
- Equity outcomes:

  Fiscal gap > Extreme poverty > Benchmark > Population share

- Growth outcomes:

  Population share > Benchmark > Fiscal gap > Extreme poverty

- In spite of the improvement in regional cohesion, the more redistributive scenarios may hamper overall growth.
- In order to compensate for the potential overall GDP loss, it would be necessary that additional transfers beyond the benchmark values should be directed to long-run TFP-enhancing expenditures.
- Quality of expenditures?



NEREUS

Núcleo de Economia Regional e Urbana da Universidade de São Paulo

The University of São Paulo Regional and Urban Economics Lab

BANCO DE LA REPÚBLICA

CENTRO DE ESTUDIOS ECONÓMICOS REGIONALES (CEER) - CARTAGENA

Thank you!

Eduardo Haddad Luis Galvis Inácio Araújo-Júnior Vinicius Vale