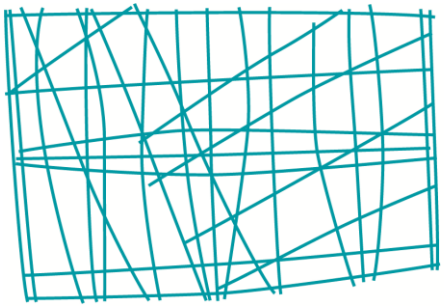


NEREUS

Núcleo de Economia Regional e Urbana
da Universidade de São Paulo

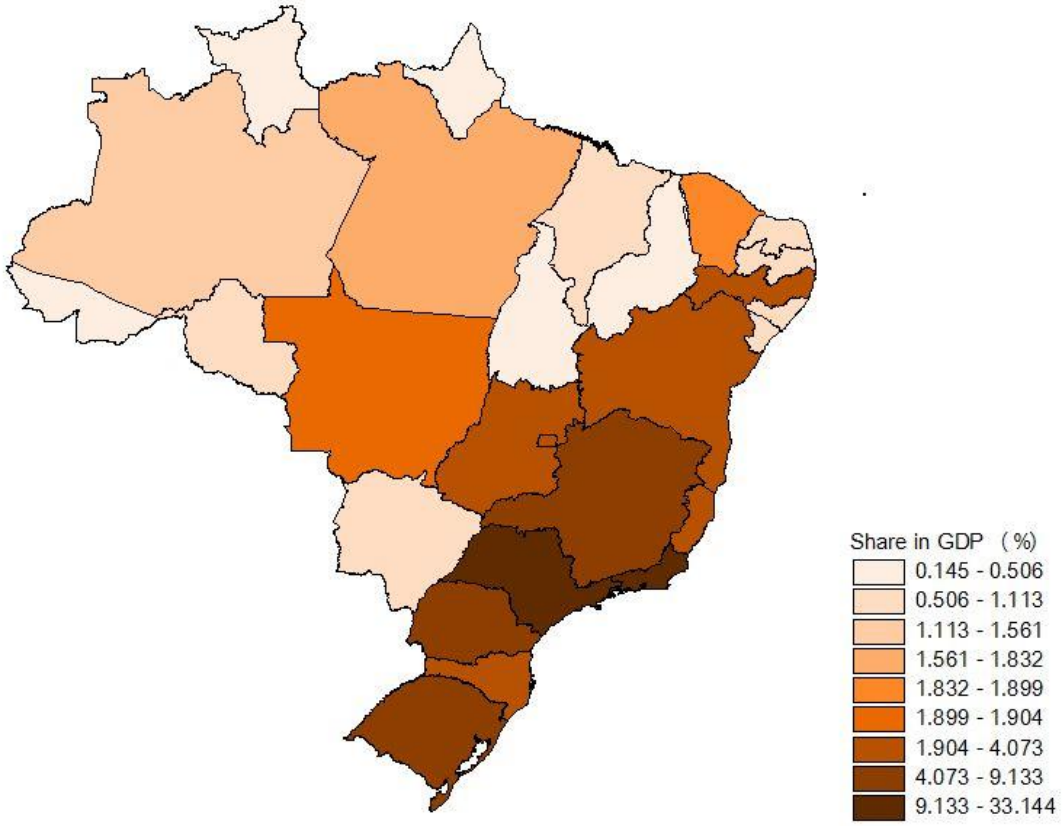
The University of São Paulo
Regional and Urban Economics Lab

Lecture 15: Intergovernmental Transfers

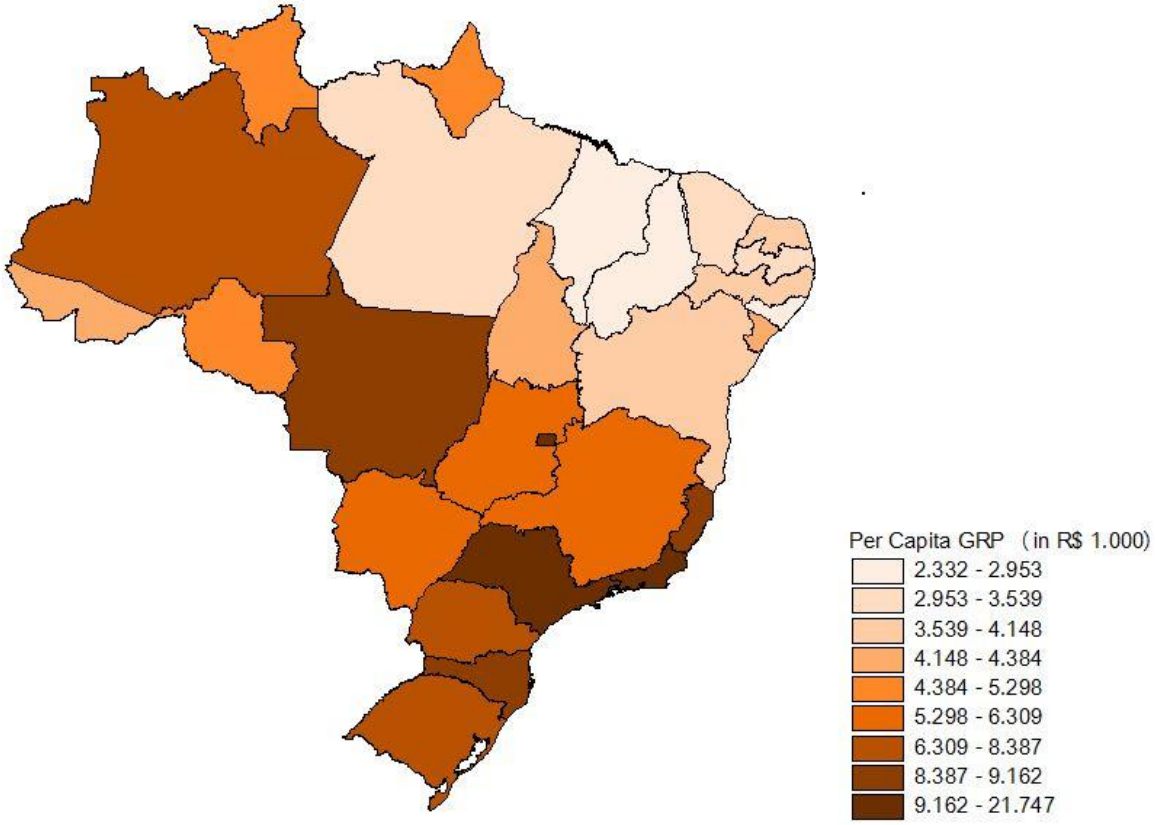
Prof. Eduardo A. Haddad

Brazil: what role does the production structure play?

Regional shares in GDP



Per Capita GRP



Constitutional transfers in Brazil

1988 Constitution changed the criteria for regional transfers:

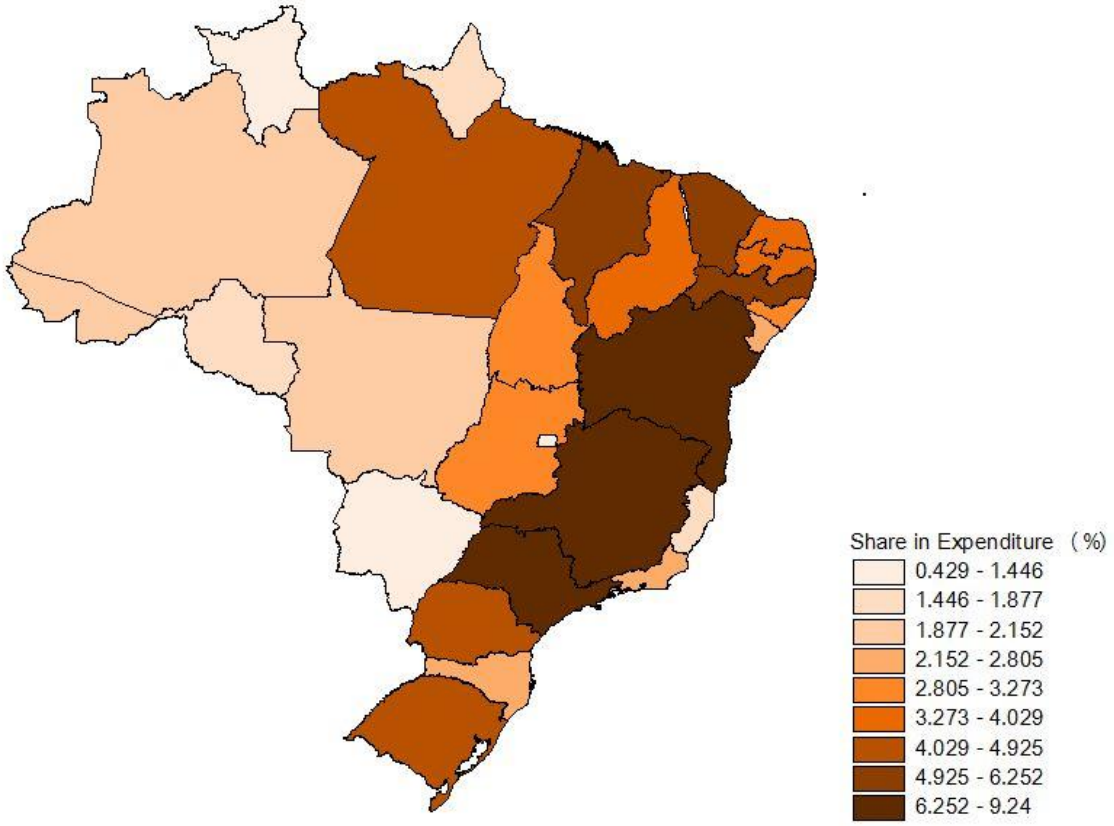
- FPE (state) and FPM (municipalities)
- Per capita GDP and population
- Source of funds: manufacturing tax (44% of total revenue) and income tax (44% of total revenue)
- 2006: BRL 73 billions (19% of Federal Govt. tax revenue; approx. 3.1% of GDP)
- Complaints from more developed regions (e.g. SP)

Regional shares in Federal government tax revenue* and expenditures**

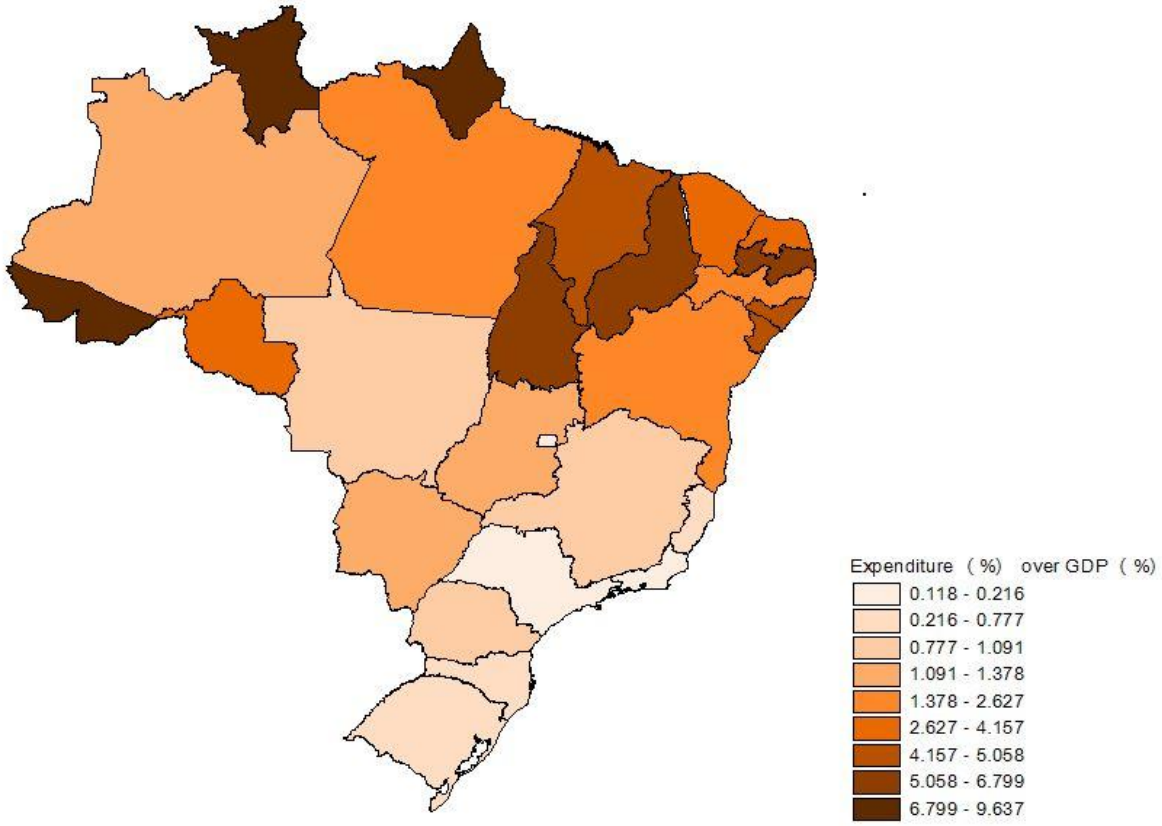
	Regional Revenues (A)	*Regional Expenditures (B)*	*(A) - (B)*
North	***1,70***	***16,88***	***-15,18***
RO	0,13	1,84	-1,71
AC	0,04	1,96	-1,91
AM	0,86	2,15	-1,29
RR	0,04	1,38	-1,34
PA	0,48	4,81	-4,33
AP	0,05	1,88	-1,82
TO	0,09	2,86	-2,77
Northeast	***5,34***	***43,88***	***-38,54***
MA	0,25	5,63	-5,38
PI	0,14	3,44	-3,30
CE	0,82	6,25	-5,43
RN	0,24	3,34	-3,10
PB	0,26	4,03	-3,77
PE	1,27	5,88	-4,62
AL	0,20	3,27	-3,07
SE	0,20	2,80	-2,61
BA	1,98	9,24	-7,26
Southeast	***70,90***	***19,85***	***51,05***
MG	6,24	8,94	-2,70
ES	1,43	1,61	-0,18
RJ	19,64	2,16	17,48
SP	43,59	7,15	36,45
South	***10,64***	***12,18***	***-1,54***
PR	4,12	4,92	-0,81
SC	2,14	2,62	-0,48
RS	4,38	4,63	-0,25
Center-west	***11,42***	***7,21***	***4,21***
MS	0,27	1,45	-1,18
MT	0,32	2,08	-1,75
GO	0,83	3,26	-2,43
DF	10,00	0,43	9,57

** Manufacturing tax (44.0%) and income tax (44.0%)* *** Constitutional transfers*

Regional shares in transfers expenditures



Regional transfers (%) over GDP (%)



Research issues

Data compilation

- Information on various sources

Interstate I-O model

- Application of **closed model** for Brazil

Research question:

Does the production structure act in favor of more developed regions countervailing the redistributional effects of regional transfers through the operation of indirect and induced multiplier effects?

Simulations

Interstate input-output model

- 27 regions
- 55 sectors, 110 products

Benchmark: impacts of current regional expenditure structure on regional VA

Focus: value added (tax base)

Counterfactual: structure of interregional government transfers would follow exactly the regional structure of Federal government's tax revenue

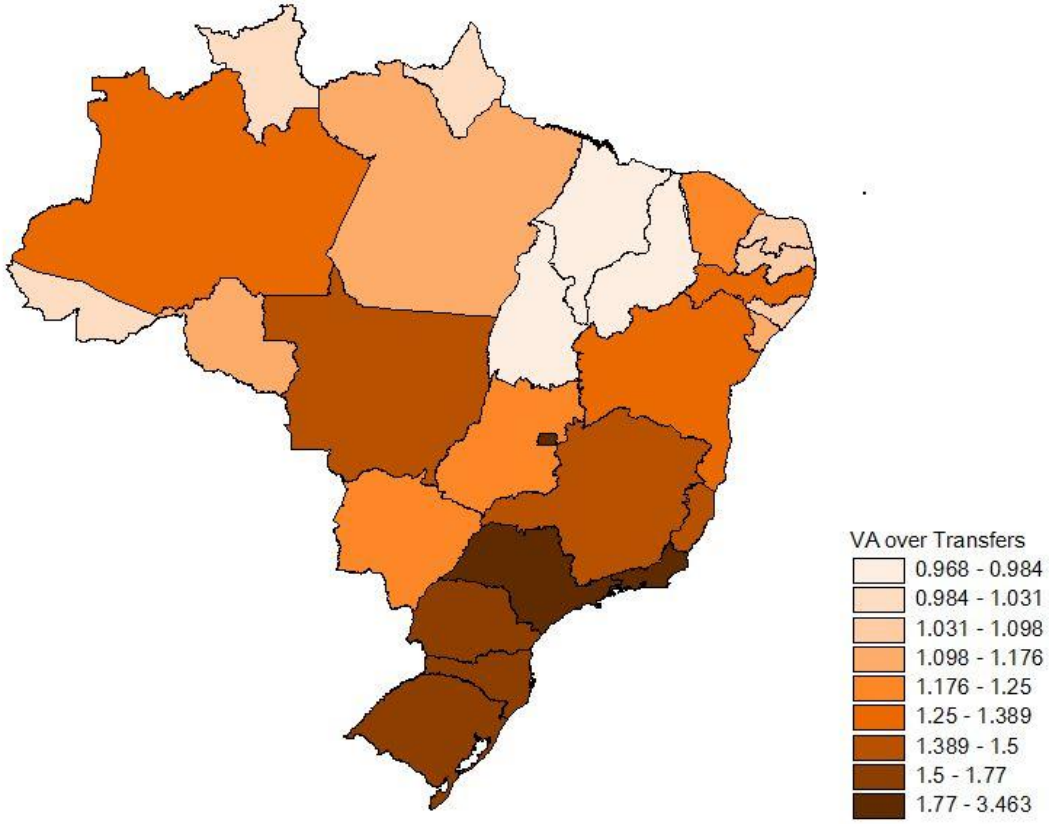
Regional effects of interregional transfers in Brazil: Benchmark simulation

	Regional Share in GRP (A)	*Regional Share in Expenditures (B)*	*Regional Share in Total VA Impact (C)*	*(C) - (B)*
North	***4,95***	***16,88***	***12,86***	***-4,02***
RO	0,58	1,84	1,44	-0,41
AC	0,20	1,96	1,38	-0,58
AM	1,56	2,15	2,04	-0,11
RR	0,14	1,38	0,96	-0,42
PA	1,83	4,81	3,80	-1,01
AP	0,20	1,88	1,32	-0,56
TO	0,43	2,86	1,92	-0,94
Northeast	***12,72***	***43,88***	***34,63***	***-9,25***
MA	1,11	5,63	3,73	-1,90
PI	0,51	3,44	2,31	-1,13
CE	1,90	6,25	5,35	-0,91
RN	0,80	3,34	2,49	-0,85
PB	0,77	4,03	2,91	-1,12
PE	2,27	5,88	5,22	-0,66
AL	0,66	3,27	2,46	-0,82
SE	0,63	2,80	2,26	-0,55
BA	4,07	9,24	7,91	-1,33
Southeast	***55,83***	***19,85***	***32,21***	***12,36***
MG	9,13	8,94	8,78	-0,15
ES	2,07	1,61	1,65	0,04
RJ	11,48	2,16	4,85	2,69
SP	33,14	7,15	16,92	9,78
South	***17,39***	***12,18***	***13,48***	***1,30***
PR	6,31	4,92	5,15	0,23
SC	3,99	2,62	3,17	0,55
RS	7,10	4,63	5,15	0,52
Center-west	***9,11***	***7,21***	***6,82***	***-0,39***
MS	1,09	1,45	1,17	-0,27
MT	1,90	2,08	2,05	-0,03
GO	2,47	3,26	2,74	-0,52
DF	3,64	0,43	0,86	0,43

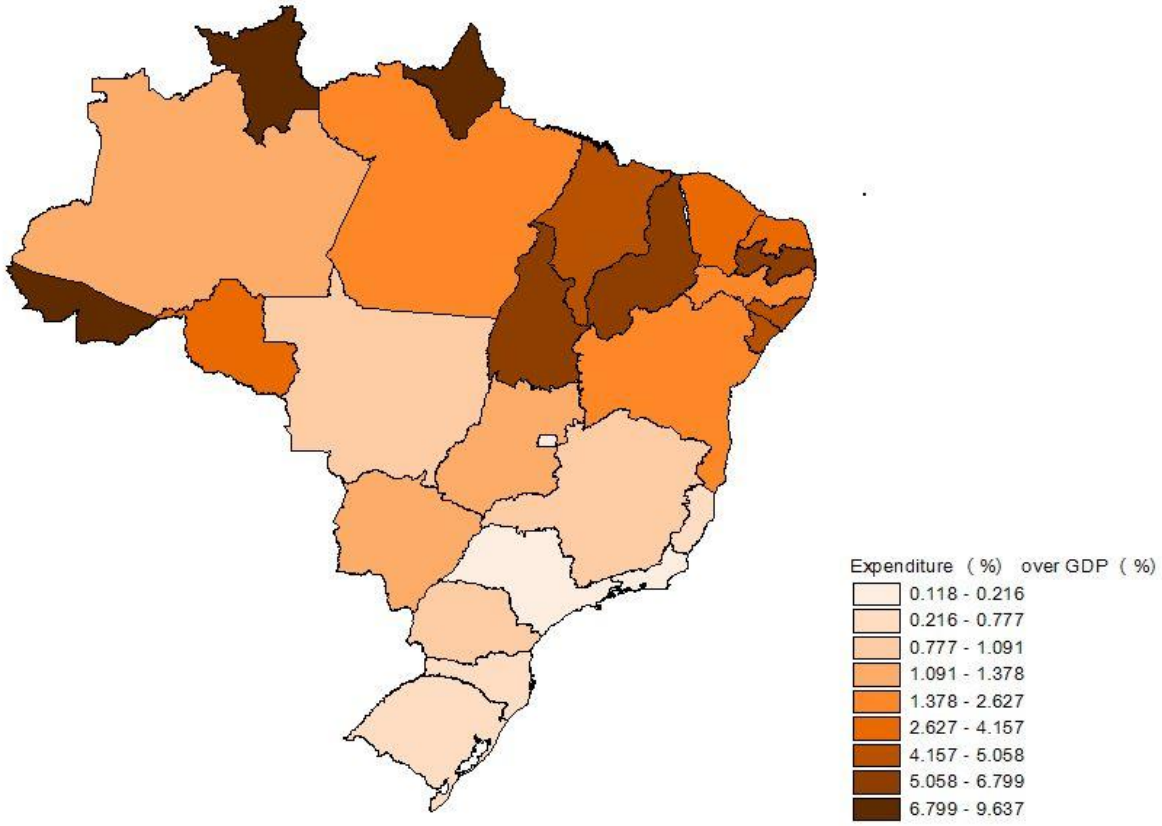
Regional effects of interregional transfers in Brazil: Benchmark simulation

	Regional Transfers in BRL millions (A)	*Regional VA in BRL millions (B)*	*(B)/(A)*
North	***12296,66***	***13703,88***	***1,11***
RO	1343,92	1532,68	1,14
AC	1425,02	1469,50	1,03
AM	1567,57	2177,22	1,39
RR	1004,46	1023,34	1,02
PA	3505,69	4052,11	1,16
AP	1367,28	1405,50	1,03
TO	2082,72	2043,53	0,98
Northeast	***31968,35***	***36889,68***	***1,15***
MA	4099,90	3969,83	0,97
PI	2504,30	2463,41	0,98
CE	4554,73	5694,64	1,25
RN	2430,27	2652,47	1,09
PB	2934,73	3103,27	1,06
PE	4285,98	5562,40	1,30
AL	2384,13	2616,60	1,10
SE	2043,17	2402,52	1,18
BA	6731,13	8424,54	1,25
Southeast	***14460,25***	***34307,60***	***2,37***
MG	6509,35	9353,89	1,44
ES	1173,14	1759,28	1,50
RJ	1572,03	5167,66	3,29
SP	5205,73	18026,76	3,46
South	***8869,58***	***14357,08***	***1,62***
PR	3587,49	5490,96	1,53
SC	1907,48	3376,25	1,77
RS	3374,61	5489,87	1,63
Center-west	***5252,89***	***7263,82***	***1,38***
MS	1053,64	1248,47	1,18
MT	1512,47	2183,32	1,44
GO	2374,61	2919,15	1,23
DF	312,17	912,87	2,92
BRAZIL	***72847,73***	***106522,06***	***1,46***

Value added over transfers (“multiplier”)



Regional transfers (%) over GDP (%)



Regional effects of interregional transfers in Brazil: Benchmark simulation

	Regional Transfers in BRL millions (A)	*Regional Gross Output in BRL millions (B)*	*(B)/(A)*
North	***12296,66***	***21139,75***	***1,72***
RO	1343,92	2242,44	1,67
AC	1425,02	2008,04	1,41
AM	1567,57	4459,04	2,84
RR	1004,46	1432,22	1,43
PA	3505,69	6081,84	1,73
AP	1367,28	1885,61	1,38
TO	2082,72	3030,57	1,46
Northeast	***31968,35***	***60583,94***	***1,90***
MA	4099,90	6401,13	1,56
PI	2504,30	3790,98	1,51
CE	4554,73	9368,72	2,06
RN	2430,27	4205,55	1,73
PB	2934,73	4533,62	1,54
PE	4285,98	9363,88	2,18
AL	2384,13	4065,56	1,71
SE	2043,17	3571,92	1,75
BA	6731,13	15282,58	2,27
Southeast	***14460,25***	***66430,91***	***4,59***
MG	6509,35	16039,84	2,46
ES	1173,14	2887,30	2,46
RJ	1572,03	9859,47	6,27
SP	5205,73	37644,30	7,23
South	***8869,58***	***28506,28***	***3,21***
PR	3587,49	10712,93	2,99
SC	1907,48	6482,69	3,40
RS	3374,61	11310,66	3,35
Center-west	***5252,89***	***13048,16***	***2,48***
MS	1053,64	2261,70	2,15
MT	1512,47	3932,77	2,60
GO	2374,61	5177,63	2,18
DF	312,17	1676,05	5,37
BRAZIL	***72847,73***	***189709,05***	***2,60***

Final remarks

Spatial focus – "poorer regions get more"

Relevant leakages from lagging regions

Benefits tend to go to Southeast/South, especially SP

"Spatial trap" – persistent dualism

Methodological issues: CGE approach

- Optimal allocation for a given policy target

Regional effects of interregional transfers in Brazil: Counterfactual simulation

	Regional Share in GRP (A)	*Regional Share in Expenditures (B)*	*Regional Share in Total VA Impact (C)*	*(C) - (B)*
North	***4,95***	***1,70***	***1,94***	***0,25***
RO	0,58	0,13	0,21	0,07
AC	0,20	0,04	0,06	0,02
AM	1,56	0,86	0,85	-0,01
RR	0,14	0,04	0,04	0,00
PA	1,83	0,48	0,59	0,11
AP	0,20	0,05	0,05	-0,01
TO	0,43	0,09	0,15	0,06
Northeast	***12,72***	***5,34***	***5,55***	***0,20***
MA	1,11	0,25	0,30	0,05
PI	0,51	0,14	0,14	0,00
CE	1,90	0,82	0,82	0,00
RN	0,80	0,24	0,26	0,02
PB	0,77	0,26	0,27	0,01
PE	2,27	1,27	1,13	-0,14
AL	0,66	0,20	0,25	0,05
SE	0,63	0,20	0,25	0,05
BA	4,07	1,98	2,13	0,15
Southeast	***55,83***	***70,90***	***70,67***	***-0,23***
MG	9,13	6,24	7,22	0,98
ES	2,07	1,43	1,52	0,10
RJ	11,48	19,64	17,30	-2,34
SP	33,14	43,59	44,62	1,03
South	***17,39***	***10,64***	***12,59***	***1,95***
PR	6,31	4,12	4,80	0,69
SC	3,99	2,14	2,86	0,72
RS	7,10	4,38	4,93	0,55
Center-west	***9,11***	***11,42***	***9,25***	***-2,17***
MS	1,09	0,27	0,47	0,20
MT	1,90	0,32	0,83	0,50
GO	2,47	0,83	1,60	0,77
DF	3,64	10,00	6,36	-3,64

Colombia: efficiency-equity trade-off

Simulation design

1. Benchmark values

i. Regionalized government expenditures in the database (BAS5)
ii. Intergovernmental transfers informed by the CEER team (TRF)

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

Exercise 1 (population)

Region	Department	BAS5	Transfers to be redistributed	Transfer redistribution based on the population share	Net transfer redistribution based on the population share	Shock (f5gen)
		(A)	(B)	(C)	(C)-(B)=(D)	(D)/(A)*100
1 D_1	Antioquia	6997.49	2438.30	3766.56	1328.26	18.98
2 D_2	Atlántico	2066.11	984.82	1436.90	452.08	21.88
3 D_3	Bogotá, D.C.	20615.79	5525.26	4583.54	-941.72	-4.57
4 D_4	Bolívar	1877.53	1199.59	1226.24	26.65	1.42
5 D_5	Boyacá	1507.04	898.49	769.52	-128.97	-8.56
6 D_6	Caldas	901.54	507.88	594.61	86.73	9.62
7 D_7	Caquetá	767.40	639.59	278.18	-361.41	-47.10
8 D_8	Cauca	1162.87	885.93	812.81	-73.11	-6.29
9 D_9	Cesar	1007.47	608.89	600.29	-8.61	-0.85
10 D_10	Chocó	712.56	566.90	293.94	-272.96	-38.31
11 D_11	Córdoba	1408.01	958.15	988.37	30.22	2.15
12 D_12	Cundinamarca	2911.02	1229.62	1548.33	318.72	10.95
13 D_13	La Guajira	598.99	400.87	529.42	128.55	21.46
14 D_14	Huila	891.54	575.82	673.15	97.33	10.92
15 D_15	Magdalena	1062.14	820.23	740.91	-79.32	-7.47
16 D_16	Meta	1952.73	606.28	548.96	-57.32	-2.94
17 D_17	Nariño	1557.35	1135.00	1017.52	-117.48	-7.54
18 D_18	Norte de Santander	1270.88	837.35	799.57	-37.78	-2.97
19 D_19	Quindío	537.52	311.64	336.49	24.85	4.62
20 D_20	Risaralda	841.32	450.87	566.58	115.71	13.75
21 D_21	Santander	2068.39	995.15	1229.39	234.24	11.32
22 D_22	Sucre	1139.40	778.48	500.52	-277.97	-24.40
23 D_23	Tolima	1810.21	1110.84	845.13	-265.70	-14.68
24 D_24	Valle del Cauca	4913.10	2493.09	2708.69	215.61	4.39
25 D_25	Amazonas	122.32	82.30	44.62	-37.69	-30.81
26 D_26	Arauca	557.54	273.15	153.50	-119.64	-21.46
27 D_27	Casanare	766.96	192.68	204.55	11.87	1.55
28 D_28	Guainía	61.71	41.30	23.96	-17.35	-28.11
29 D_29	Guaviare	211.33	141.51	64.40	-77.10	-36.48
30 D_30	Putumayo	523.59	354.41	201.74	-152.67	-29.16
31 D_31	Archipiélago de San André	141.93	37.23	45.13	7.89	5.56
32 D_32	Vaupés	49.74	19.31	25.66	6.35	12.77
33 D_33	Vichada	176.30	98.78	40.51	-58.27	-33.05
Total		63189.83	28199.71	28199.71	0.00	

Exercise 2 (extreme poverty)

Region	Department	BAS5	Transfers to be redistributed	Transfer redistribution based on the extreme poverty share	Net transfer redistribution based on the extreme poverty share	Shock (f5gen)
		(A)	(B)	(C)	(C)-(B)=(D)	(D)/(A)*100
1 D_1	Antioquia	6997.49	2438.30	2933.57	495.27	7.08
2 D_2	Atlántico	2066.11	984.82	649.37	-335.45	-16.24
3 D_3	Bogotá, D.C.	20615.79	5525.26	881.45	-4643.81	-22.53
4 D_4	Bolívar	1877.53	1199.59	1556.38	356.79	19.00
5 D_5	Boyacá	1507.04	898.49	813.91	-84.58	-5.61
6 D_6	Caldas	901.54	507.88	594.61	86.73	9.62
7 D_7	Caquetá	767.40	639.59	272.83	-366.76	-47.79
8 D_8	Cauca	1162.87	885.93	2657.28	1771.35	152.33
9 D_9	Cesar	1007.47	608.89	923.52	314.62	31.23
10 D_10	Chocó	712.56	566.90	1150.32	583.42	81.88
11 D_11	Córdoba	1408.01	958.15	2594.46	1636.31	116.21
12 D_12	Cundinamarca	2911.02	1229.62	937.93	-291.69	-10.02
13 D_13	La Guajira	598.99	400.87	1410.10	1009.23	168.49
14 D_14	Huila	891.54	575.82	1074.45	498.63	55.93
15 D_15	Magdalena	1062.14	820.23	1239.60	419.37	39.48
16 D_16	Meta	1952.73	606.28	485.62	-120.66	-6.18
17 D_17	Nariño	1557.35	1135.00	1682.82	547.82	35.18
18 D_18	Norte de Santander	1270.88	837.35	822.64	-14.72	-1.16
19 D_19	Quindío	537.52	311.64	391.50	79.86	14.86
20 D_20	Risaralda	841.32	450.87	348.67	-102.21	-12.15
21 D_21	Santander	2068.39	995.15	543.77	-451.38	-21.82
22 D_22	Sucre	1139.40	778.48	611.21	-167.28	-14.68
23 D_23	Tolima	1810.21	1110.84	1243.32	132.49	7.32
24 D_24	Valle del Cauca	4913.10	2493.09	1927.34	-565.75	-11.52
25 D_25	Amazonas	122.32	82.30	25.14	-57.16	-46.73
26 D_26	Arauca	557.54	273.15	86.49	-186.66	-33.48
27 D_27	Casanare	766.96	192.68	115.25	-77.43	-10.10
28 D_28	Guainía	61.71	41.30	13.50	-27.80	-45.06
29 D_29	Guaviare	211.33	141.51	36.29	-105.22	-49.79
30 D_30	Putumayo	523.59	354.41	113.67	-240.74	-45.98
31 D_31	Archipiélago de San André	141.93	37.23	25.43	-11.81	-8.32
32 D_32	Vaupés	49.74	19.31	14.46	-4.85	-9.75
33 D_33	Vichada	176.30	98.78	22.83	-75.96	-43.08
Total		63189.83	28199.71	28199.71	0.00	

Exercise 3 (fiscal gap)

Region	Department	BAS5	Transfers to be redistributed	Transfer redistribution based on the fiscal gap share	Net transfer redistribution based on the fiscal gap share	Shock (f5gen)
		(A)	(B)	(C)	(C)-(B)=(D)	(D)/(A)*100
1 D_1	Antioquia	6997.49	2438.30	2593.92	155.62	2.22
2 D_2	Atlántico	2066.11	984.82	1279.67	294.85	14.27
3 D_3	Bogotá, D.C.	20615.79	5525.26	0.00	-5525.26	-26.80
4 D_4	Bolívar	1877.53	1199.59	1438.76	239.17	12.74
5 D_5	Boyacá	1507.04	898.49	857.72	-40.77	-2.71
6 D_6	Caldas	901.54	507.88	586.57	78.69	8.73
7 D_7	Caquetá	767.40	639.59	940.73	301.14	39.24
8 D_8	Cauca	1162.87	885.93	1438.76	552.83	47.54
9 D_9	Cesar	1007.47	608.89	968.40	359.50	35.68
10 D_10	Chocó	712.56	566.90	850.81	283.91	39.84
11 D_11	Córdoba	1408.01	958.15	1618.61	660.46	46.91
12 D_12	Cundinamarca	2911.02	1229.62	802.39	-427.23	-14.68
13 D_13	La Guajira	598.99	400.87	1113.66	712.79	119.00
14 D_14	Huila	891.54	575.82	899.23	323.40	36.27
15 D_15	Magdalena	1062.14	820.23	1238.16	417.94	39.35
16 D_16	Meta	1952.73	606.28	892.31	286.03	14.65
17 D_17	Nariño	1557.35	1135.00	1701.61	566.61	36.38
18 D_18	Norte de Santander	1270.88	837.35	1113.66	276.30	21.74
19 D_19	Quindío	537.52	311.64	328.56	16.92	3.15
20 D_20	Risaralda	841.32	450.87	504.95	54.08	6.43
21 D_21	Santander	2068.39	995.15	760.88	-234.27	-11.33
22 D_22	Sucre	1139.40	778.48	947.65	169.16	14.85
23 D_23	Tolima	1810.21	1110.84	919.98	-190.86	-10.54
24 D_24	Valle del Cauca	4913.10	2493.09	1584.02	-909.06	-18.50
25 D_25	Amazonas	122.32	82.30	268.38	186.08	152.13
26 D_26	Arauca	557.54	273.15	290.52	17.37	3.12
27 D_27	Casanare	766.96	192.68	298.82	106.14	13.84
28 D_28	Guainía	61.71	41.30	214.43	173.13	280.56
29 D_29	Guaviare	211.33	141.51	389.43	247.93	117.32
30 D_30	Putumayo	523.59	354.41	473.13	118.72	22.67
31 D_31	Archipiélago de San André	141.93	37.23	0.00	-37.23	-26.23
32 D_32	Vaupés	49.74	19.31	219.96	200.66	403.40
33 D_33	Vichada	176.30	98.78	664.04	565.26	320.62
Total		63189.83	28199.71	28199.71	0.00	

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 less 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?

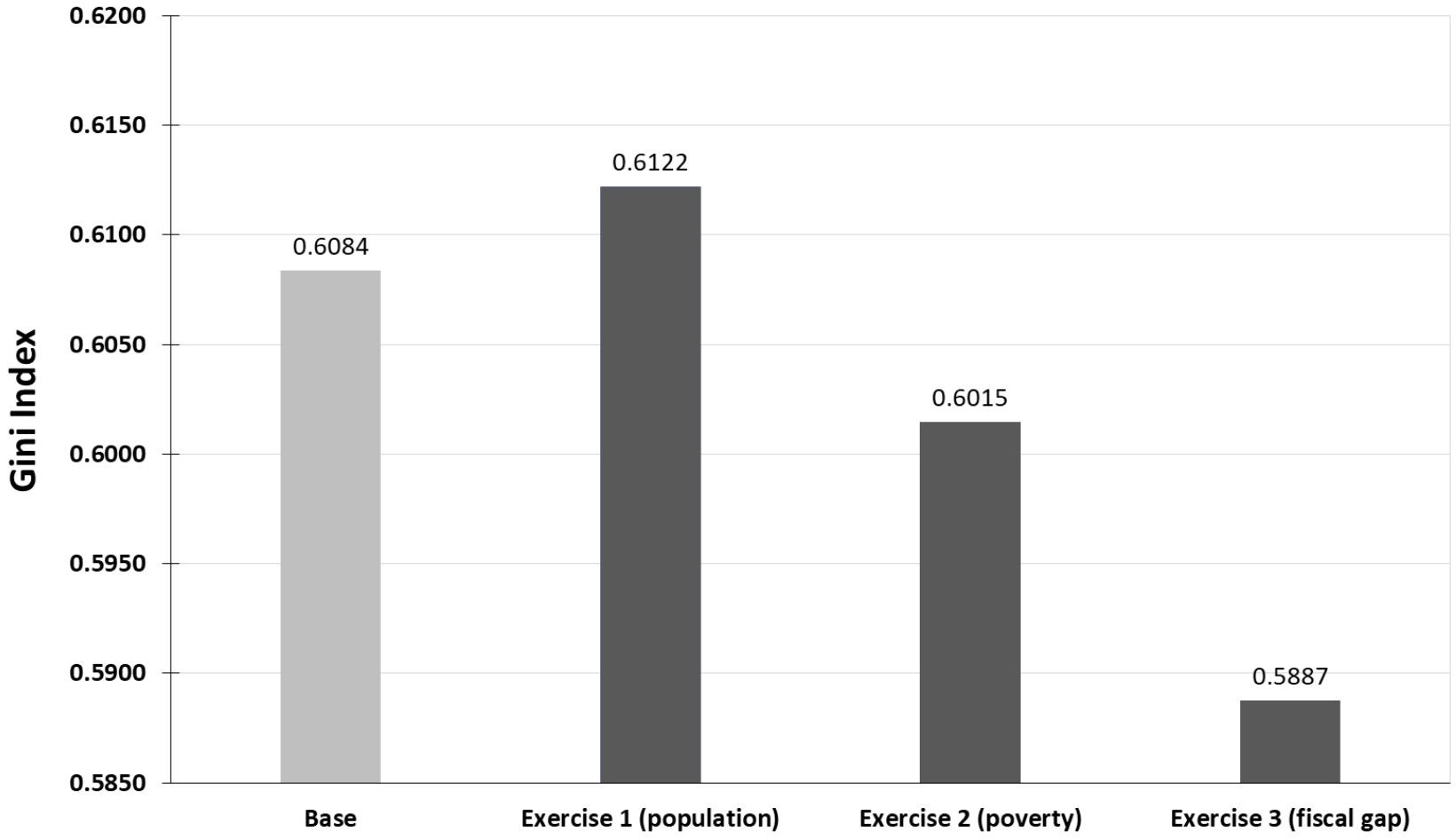
Estimation of transfers shares

1. Expenditures and transfers (SGP) of *Municipios* and *Departamentos* were aggregated for each region (*Departamentos)*
    - Source of data: *Panel CEDE* and *Hacienda*.
2. Participation of transfers in expenditures was calculated for each region
3. These shares were applied to regional government expenditures in the CEER model (BAS5) in order to estimate transfers to be redistributed.

GRP/GDP effects

Region	Department	Effects on Gross Regional Product						Benchmark shares			
		Exercise 1		Exercise 2		Exercise 3					
		Short-run	Long -run	Short-run	Long -run	Short-run	Long -run	%Transfer	%Pop	%Poverty	%Fiscal Gap
D1	Antioquia	1.305	5.508	0.915	5.547	0.345	1.813	8.647	13.357	10.941	9.198
D2	Atlántico	1.197	3.958	-0.453	-1.831	1.195	4.020	3.492	5.095	5.289	4.538
D3	Bogotá D. C.	-0.442	-1.726	-2.189	-9.321	-2.574	-10.110	19.593	16.254	5.770	0.000
D4	Bolívar	0.144	1.933	0.875	-1.568	0.773	1.178	4.254	4.348	5.880	5.102
D5	Boyacá	-0.592	-1.562	-0.860	-8.543	-0.719	-7.298	3.186	2.729	2.971	3.042
D6	Caldas	0.663	1.563	0.378	-2.069	0.298	-2.683	1.801	2.109	2.280	2.080
D7	Caquetá	-7.782	-17.913	-8.036	-19.254	6.172	11.398	2.268	0.986	1.269	3.336
D8	Cauca	-0.731	-3.015	12.764	27.405	3.814	7.006	3.142	2.882	5.470	5.102
D9	Cesar	-0.029	1.123	1.248	-5.136	1.533	-0.779	2.159	2.129	3.049	3.434
D10	Chocó	-5.854	-10.587	11.744	18.370	5.346	6.772	2.010	1.042	2.166	3.017
D11	Córdoba	0.673	4.936	7.905	16.464	3.161	6.106	3.398	3.505	6.457	5.740
D12	Cundinamarca	0.430	-0.123	-1.293	-9.492	-1.647	-10.023	4.360	5.491	3.915	2.845
D13	La Guajira	0.969	3.370	7.552	7.593	5.328	7.498	1.422	1.877	3.351	3.949
D14	Huila	0.317	-0.391	2.219	1.049	1.269	-0.711	2.042	2.387	3.317	3.189
D15	Magdalena	-0.299	1.455	2.700	3.275	2.902	6.734	2.909	2.627	4.204	4.391
D16	Meta	-0.100	1.386	-0.259	-10.595	0.422	-5.086	2.150	1.947	1.756	3.164
D17	Nariño	-1.214	-4.981	3.723	8.719	4.137	10.211	4.025	3.608	5.607	6.034
D18	Norte Santander	-0.259	-0.298	-0.368	-6.101	1.500	0.712	2.969	2.835	3.501	3.949
D19	Quindío	0.268	0.111	0.778	-1.029	-0.062	-4.016	1.105	1.193	1.418	1.165
D20	Risaralda	0.857	1.682	-0.788	-3.811	0.200	-2.943	1.599	2.009	1.747	1.791
D21	Santander	0.447	1.297	-1.001	-5.599	-0.511	-2.935	3.529	4.360	2.768	2.698
D22	Sucre	-3.473	-6.450	-2.291	-6.489	1.981	4.023	2.761	1.775	2.794	3.360
D23	Tolima	-1.241	-3.062	0.114	-5.078	-1.395	-8.118	3.939	2.997	3.876	3.262
D24	Valle	0.151	-0.663	-0.591	-2.504	-1.211	-5.162	8.841	9.605	7.894	5.617
D25	Amazonas	-7.304	-16.537	-11.530	-29.889	35.953	79.921	0.292	0.158	0.128	0.952
D26	Arauca	-1.345	1.412	-2.178	-8.713	0.160	-4.595	0.969	0.544	0.441	1.030
D27	Casanare	0.022	1.595	-0.402	-11.171	0.382	-5.647	0.683	0.725	0.587	1.060
D28	Guainía	-6.434	-13.933	-10.952	-27.854	62.419	135.093	0.146	0.085	0.069	0.760
D29	Guaviare	-10.077	-24.830	-14.200	-38.329	31.603	74.454	0.502	0.228	0.185	1.381
D30	Putumayo	-3.244	-4.547	-4.589	-12.899	2.590	1.424	1.257	0.715	0.579	1.678
D31	San Andrés y Providencia	0.868	2.043	-1.215	-3.478	-4.172	-12.522	0.132	0.160	0.130	0.000
D32	Vaupés	2.879	7.740	-4.335	-15.157	100.989	282.631	0.068	0.091	0.074	0.780
D33	Vichada	-14.408	-35.443	-19.293	-51.795	138.809	350.552	0.350	0.144	0.116	2.355
COLOMBIA		-0.021	0.358	-0.037	-3.339	-0.034	-2.787				

Gini index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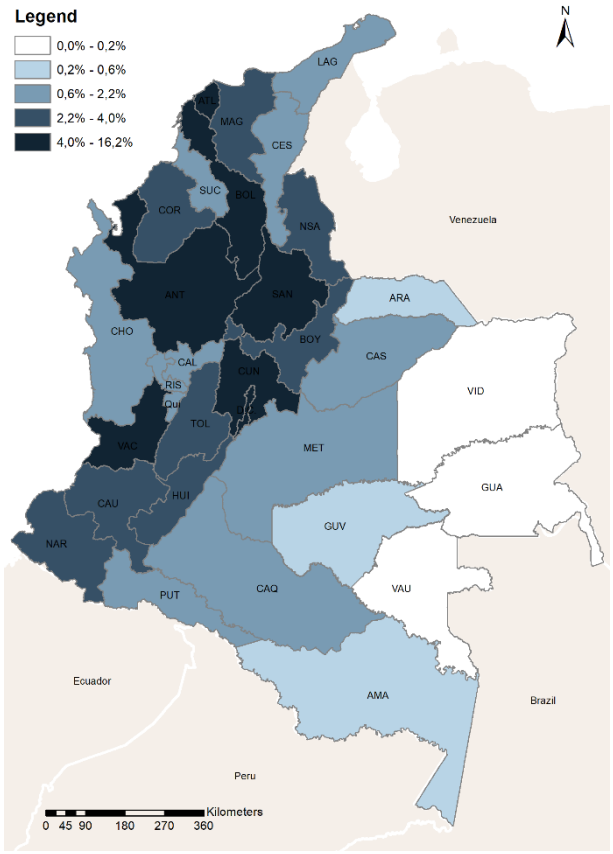
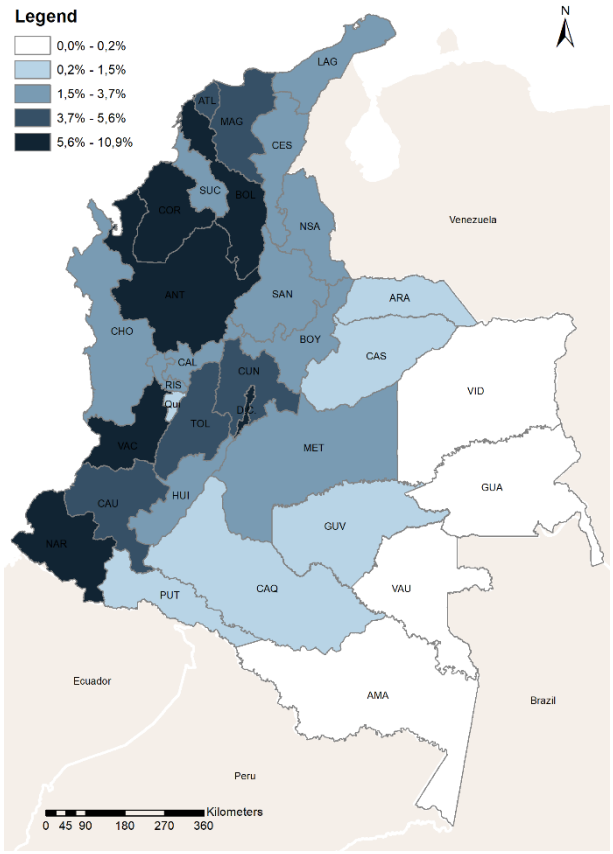
0.5850
Gini Index
0.6084
0.6122
0.6015
0.5887
Base
Exercise 1 (population)
Exercise 2 (poverty)
Exercise 3 (fiscal gap)

Benchmark shares

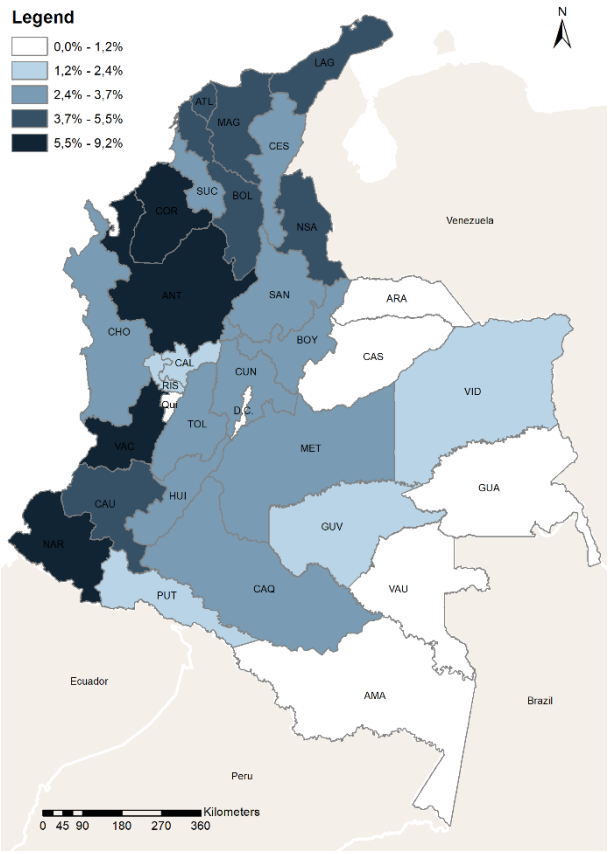
Population Share



Extreme Poverty Share

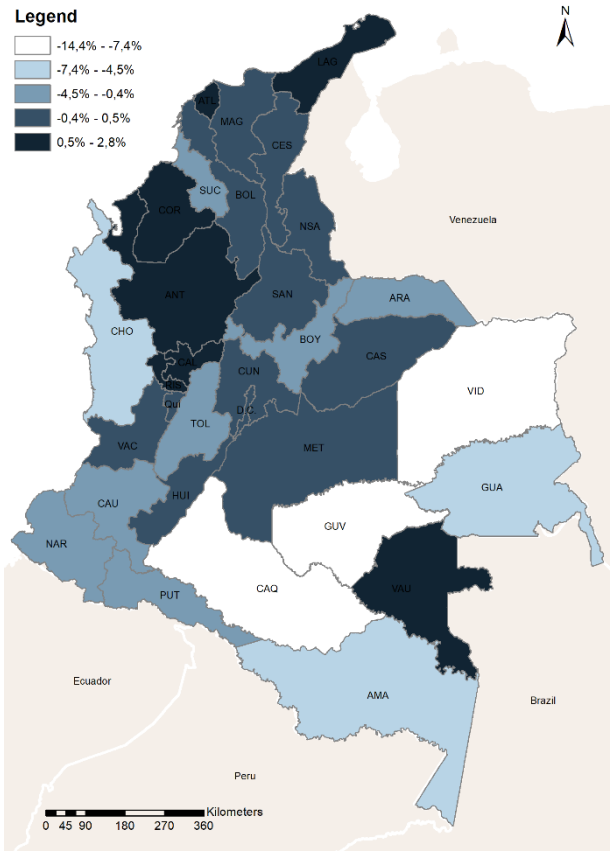


Fiscal Gap Share

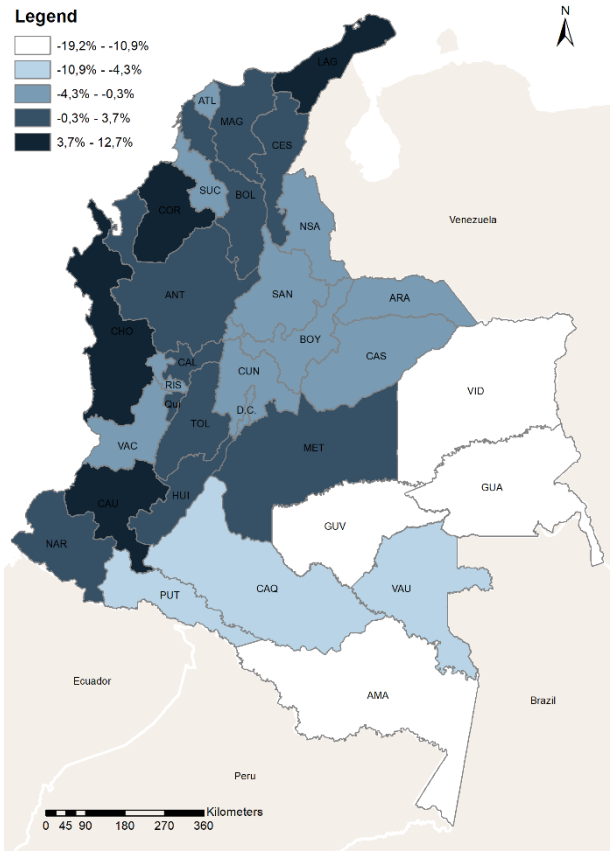


Effects on Gross Regional Product: short-run

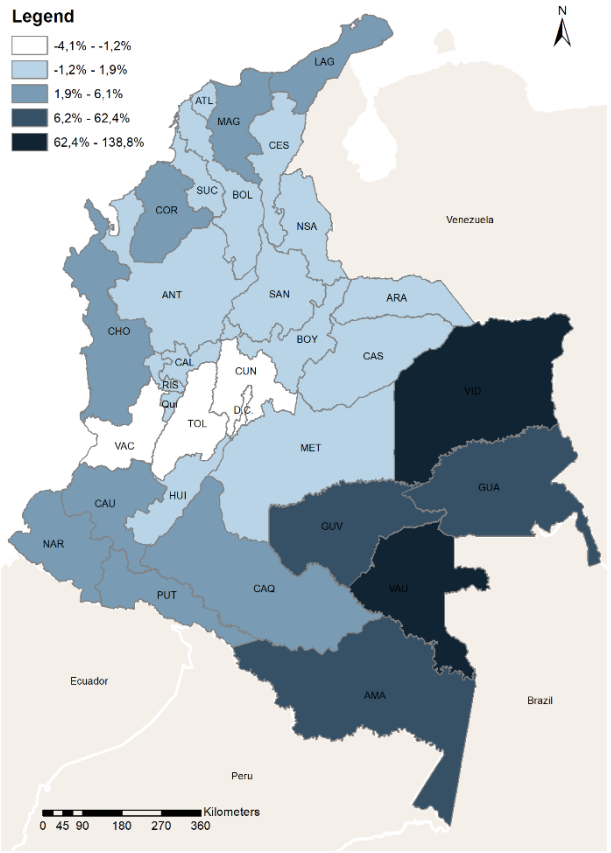
Exercise 1
(population)



Exercise 2
(extreme poverty)

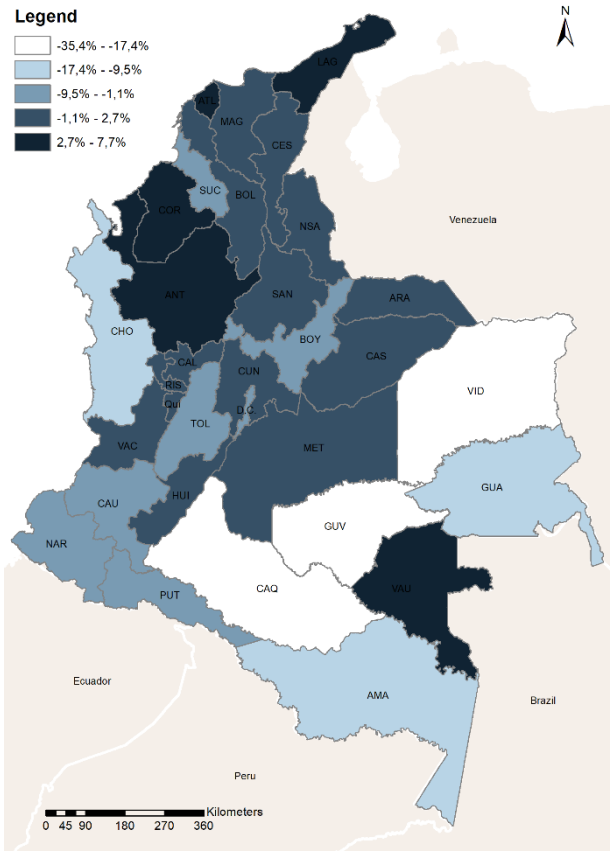


Exercise 3
(fiscal gap)

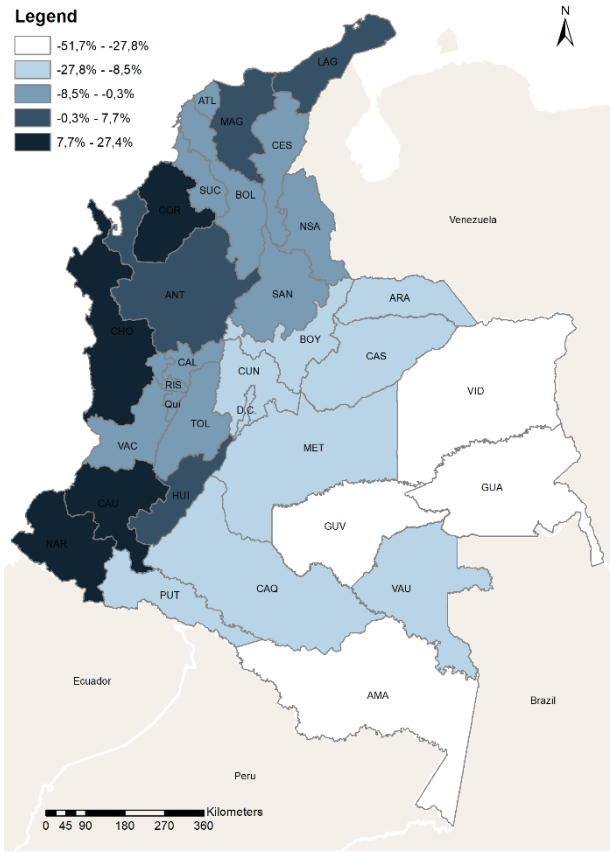


Effects on Gross Regional Product: long-run

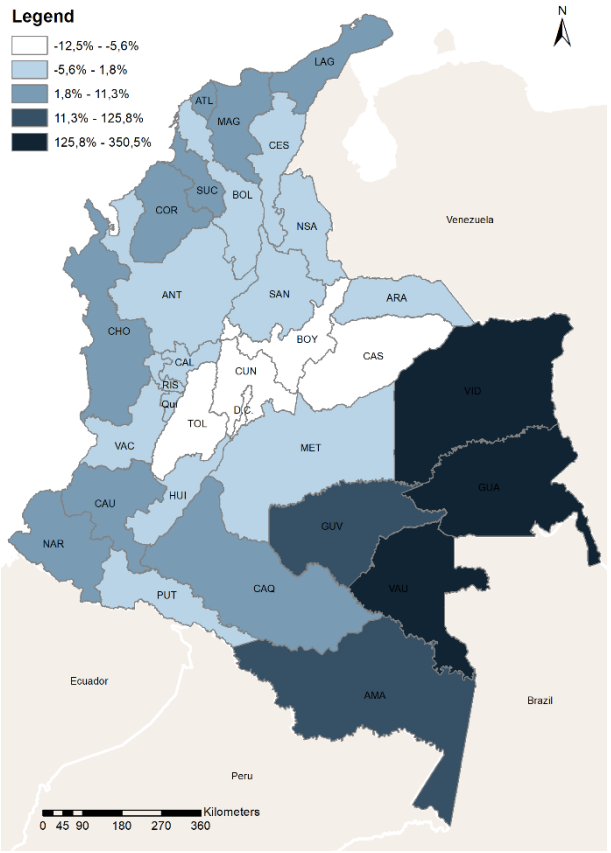
Exercise 1
(population)



Exercise 2
(extreme poverty)



Exercise 3
(fiscal gap)



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

Impacts on real national GDP

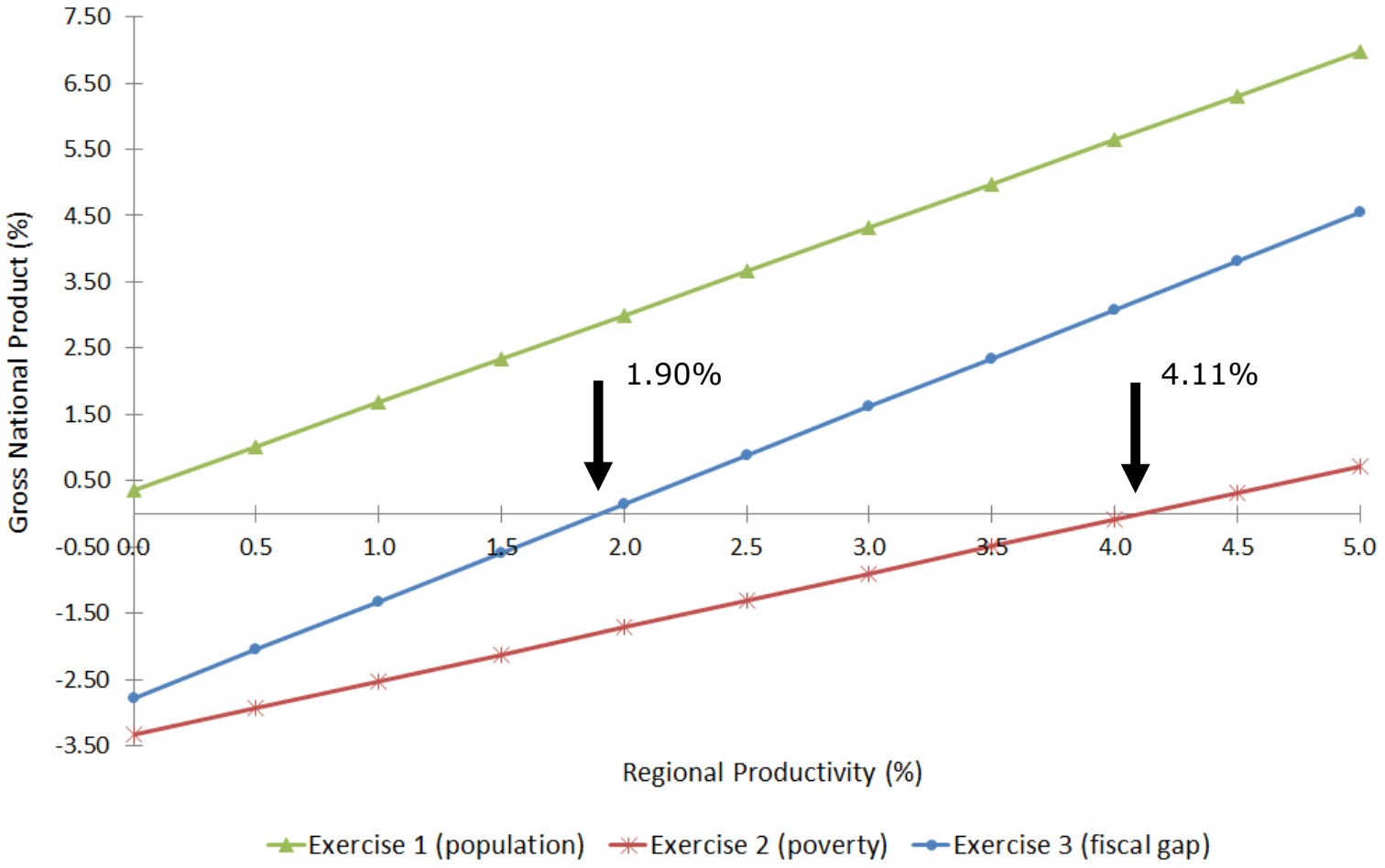
i. Scenario 1: Regional share in national population **(+)**
ii. Scenario 2: "Extreme poverty" **(-)**
iii. Scenario 3: "Fiscal gap" **(-)**

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

Finding the threshold for regional TFP growth that offsets GDP loss



Results

Weighted (value added weights) aggregate TFP in Colombia:

i. Scenario 1: **-**

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

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