INDUSTRY MOBILITY AND CITIES AGGLOMERATION FORCES:

AN ANALYSIS OF THE DYNAMICS AFFECTING THE INDUSTRIAL CONCENTRATION IN BRAZIL

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INDUSTRIAL DECONCENTRATION PROCESS

- From the 1970s
- Loss of importance of the southeast region and metropolitan regions as areas of concentration
- Larger number of small and medium concentrations
- Migration of productive activities for the southern and northeastern

DISTRIBUTION OF WORK FORCE BETWEEN INDUSTRIAL REGIONS AND KEY STATES						
Regions	1970	1985	1990	2000	2011	Variation between 1970 and 2011
Amazonas/AM	0.40%	1.10%	1.10%	1.07%	1.64%	311%
Pará/PA	0.90%	1.10%	1.10%	1.29%	1.26%	40%
Demais estados	0.20%	0.40%	0.40%	0.67%	0.79%	295%
NORTH	**1.50%**	**2.70%**	**2.60%**	**3.04%**	**3.69%**	**146%**
Pernambuco/PE	3.30%	2.70%	3.80%	2.61%	2.77%	-16%
Bahia/BA	2.20%	2.60%	2.10%	2.22%	2.97%	35%
Demais Estados	4.70%	5.40%	5.90%	7.31%	7.77%	65%
NORTHEAST	**10.20%**	**10.70%**	**11.80%**	**12.14%**	**13.51%**	**32%**
São Paulo/SP	48.00%	45.10%	44.90%	37.29%	34.04%	-29%
Metropolitan Region of São Paulo	33.60%	27.90%	22.10%	18.74%	14.46%	-57%
Minas Gerais/MG	7.50%	8.50%	8.10%	10.37%	10.72%	43%
Rio de Janeiro/RJ	13.30%	9.40%	9.50%	6.11%	5.77%	-57%
Metropolitan Region of Rio de Janeiro	8.90%	7.60%	6.10%	4.27%	3.54%	-60%
Espírito Santo/ES	0.80%	1.20%	1.10%	1.63%	1.62%	102%
SOUTHEAEST	**69.60%**	**64.20%**	**63.60%**	**55.40%**	**52.15%**	**-25%**
Paraná/PR	4.20%	4.60%	5.30%	7.23%	8.27%	97%
Santa Catarina/SC	4.40%	5.50%	5.80%	7.61%	7.88%	79%
Rio Grande do Sul/RS	8.20%	9.90%	9.30%	10.44%	9.02%	10%
SOUTH	**16.80%**	**20.00%**	**20.40%**	**25.28%**	**25.17%**	**50%**
MIDWEST	**1.4%**	**2.2%**	**2.1%**	**4.14%**	**5.49%**	**-96%**

OBJECTIVES

- Contribute to the understanding about the output process of the industry from traditional regions of concentration and major urban centers.

- Make a descriptive analysis of the evolution of industrial geographic concentration in the last two decades.

- Explore the methodological framework of the work of Ellison and Glaeser (1997) and Dumais, Ellison and Glaeser (2002) to analyze the Brazilian industrial production.

METHODOLOGY

- Period: 1991, 1996, 2000, 2005 and 2011
- Territorial Unit: 558 Brazilian microregions
- Sector Unit: 108 Scnae industries
- Data about employed persons from RAIS - Establishment and Identified

RECENT CHANGES IN GEOGRAPHIC DECONCENTRATION

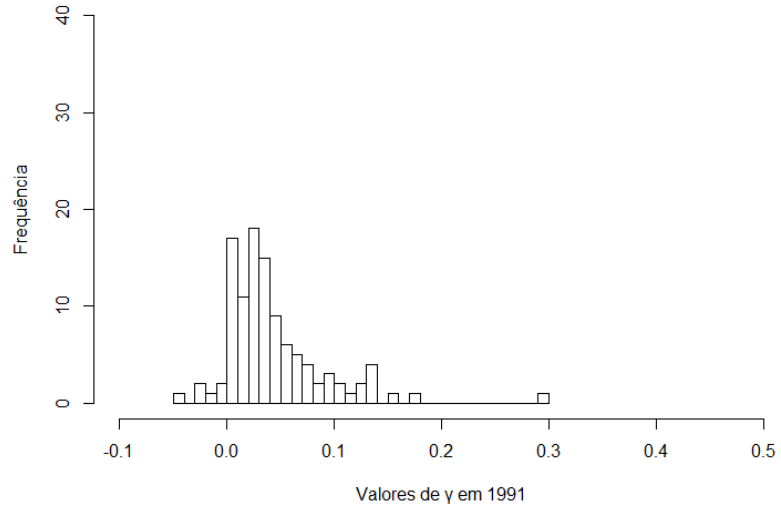
The Ellison e Glaeser (1997) index

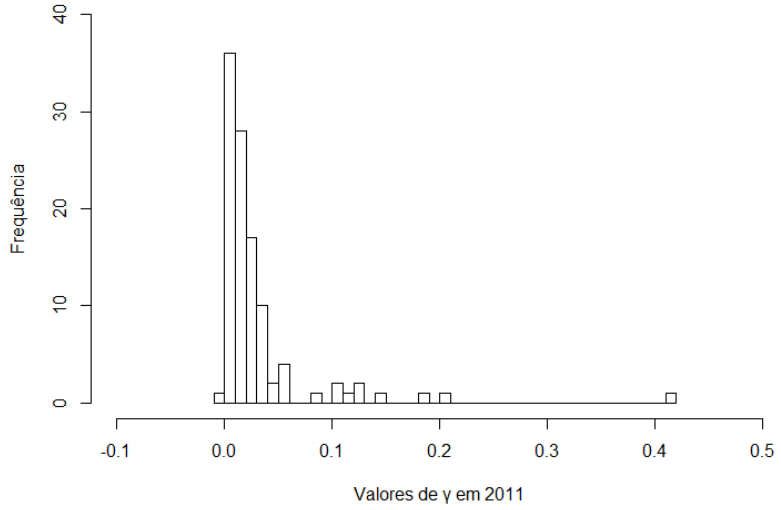
$$\gamma_{i,t} = \frac{\left(G_{i,t} - HH_{i,t}\right)}{\left(1 - HH_{i,t}\right)}$$

- Positive value indicates that the existing agglomeration is higher than that expected from randomness – dartboard approach model
- Advantages: measures concentration regardless of the number of industrial plants that compose the sector
- Disadvantages: (a) does not distinguish between agglomeration economies and natural advantages and (b) treats the spatial units symmetrically

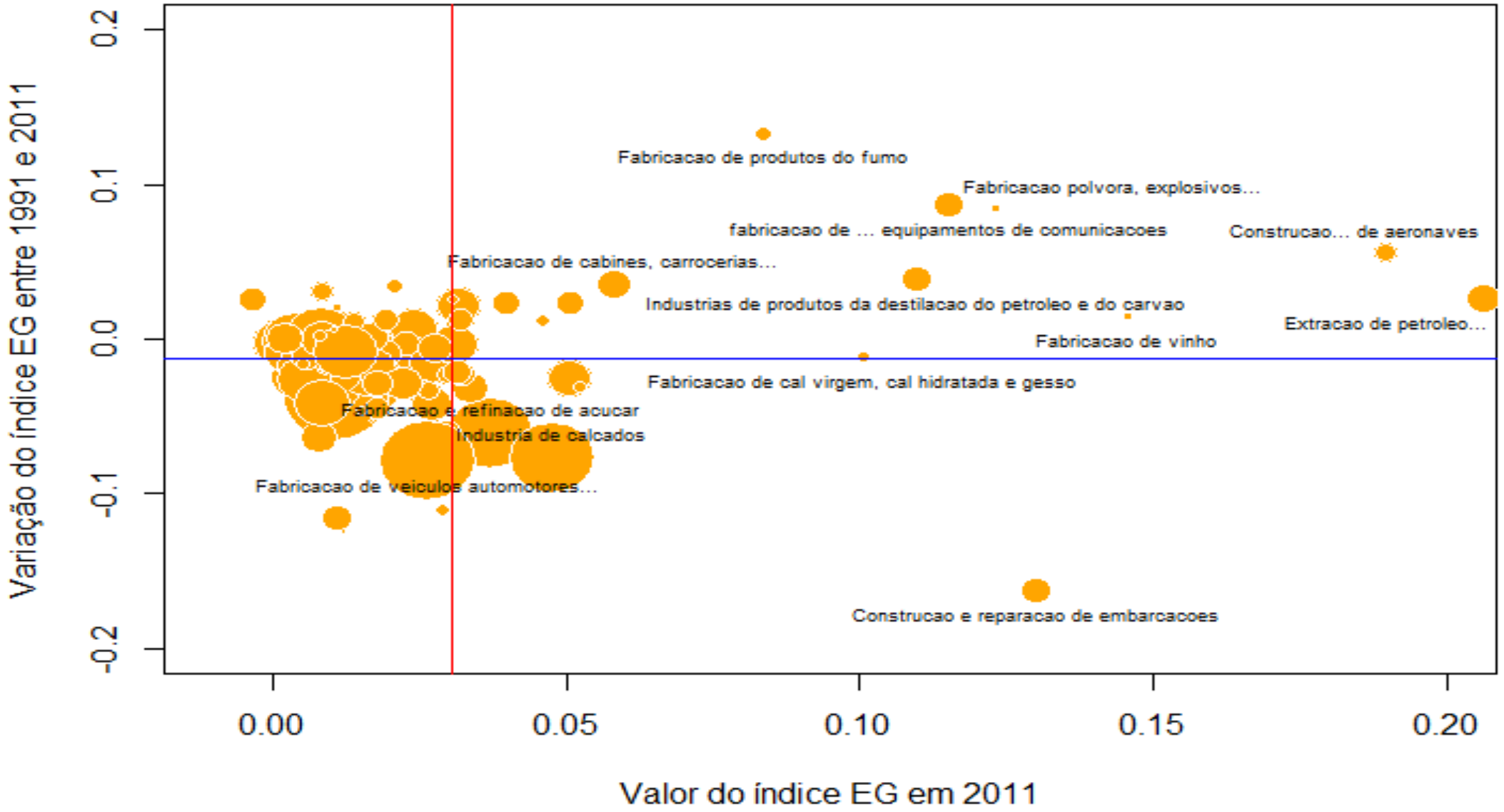
RESULTS

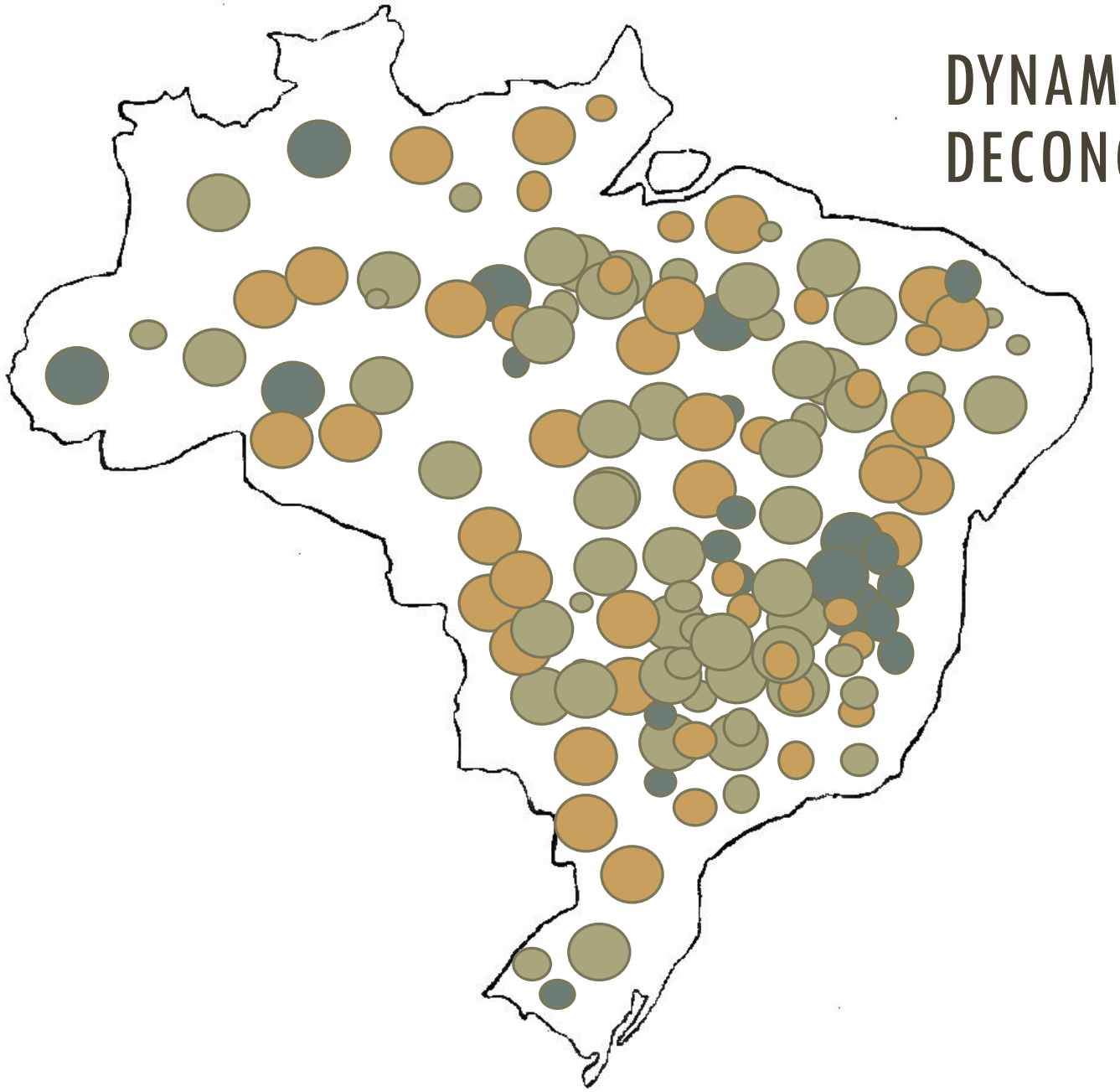
- During the two last decades the industry reduced its concentration considerably, continuing the process observed since the 1970s;
- Evidence of a deceleration of the reduction process of industrial concentration from weighted data;
- The locational advantages remained very strong in the context of the microregions;





RESULTS


Variação do índice EG entre 1991 e 2011
0.2
0.1
0.0
-0.1
-0.2
0.00
0.05
0.10
0.15
0.20
Valor do índice EG em 2011
Fabricacao de produtos do fumo
Fabricacao polvora, explosivos...
fabricacao de ... equipamentos de comunicacoes
Construcao... de aeronaves
Fabricacao de cabines, carrocerias...
Industrias de produtos da destilacao do petroleo e do carvao
Extracao de petroleo...
Fabricacao de vinho
Fabricacao de cal virgem, cal hidratada e gesso
Fabricacao e refinacao de acucar
Industria de calcados
Fabricacao de veiculos automotores...
Construcao e reparacao de embarcacoes



DYNAMIC ANALYSIS OF THE DECONCENTRATION

Objective:

Understand the process of industrial deconcentration from a dynamic approach, as product of new industrial centers, the decline of old specialized regions, the emergence of new plants and closing business.

RESULTS

RAW CONCENTRATION CHANGES ACROSS INDUSTRIES ESTIMATES (1991-2011)							
All industry sextors	Mean γ (1991)	Correlation Sis 1991-2011	Estimates		Five-year percentage change in raw concentration		
			β	σ	Total	Mean Reversion	Dispersion
	0.04218	0.70600	-0.23845 (0.00113)	0.00578	-10.02%	-42.00%	31.97%

- Large effects of reversion to the mean and dispersion effects.
- High industry mobility.
- Even geographically concentrated industries have high rates of mobility.

RESULTS

Time Period	PERCENTAGE CHANGE OF γ ATTRIBUTED TO THE FOLLOWING EVENTS					
	Percentage Change of γ	Birth	Expansions	Switches	Contraction	Closures
Total	-2.98527	-27.17083	-2.11999	-3.16995	2.30824	27.21023
1991-1996	-6.88131	-40.38692	-7.05858	-3.80952	6.03440	38.14859
1996-2000	-3.11392	-38.21711	-7.76677	9.54922	11.25342	22.17330
2000-2005	-7.63661	-37.58408	6.71513	-7.89845	4.09810	27.99428
2005-2011	-5.07011	-28.08111	-18.33474	-0.44022	12.56305	29.84710

- Counterintuitive result: the birth of firms contributes to the deagglomeration of industrial activity.
- The closure of plants contributes to industrial agglomeration.

CONCLUSIONS

- The results are consistent with the process of reducing regional inequalities and the growth of medium-sized cities;

- Currently, medium cities have the most relevant forces of agglomeration in attracting industry;

- Shorter life cycle in regions with lower concentration;

- Implications for urban policies and local development strategies

Thank You

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