Labour mobility, higher education, and urban centrality in Brazil

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Introduction

- Brazil: labour displacements since the 1990's:
  - Transitional period.
  - Rupture of the dominant pattern (Northeast-Southeast).
- Internalization of the urban process.
- Emergence of new migrant-absorbing areas.

Introduction

- Polarized by:
  - Metropolitan areas.
  - Medium-sized cities.
- These facts have expressive implications to the dynamics of labour markets:
  - Probability of occupational insertion versus individual characteristics (non-productive and productive, such as propensity to migrate and schooling).

(1) Objectives

- Analyze the interactions between labour mobility and urban development in Brazil.

- Highlights:

  - Individual non-productive characteristics (sex, age, colour, marital status, household position, etc.);
  - Individual productive characteristics (schooling, occupational status);
  - Region of residence (urban hierarchy);
  - Returns to migration;
  - Returns to education.

(2) Database and methodology

- Data from Brazilian Demographic Censuses provided by IBGE.

- Period of analysis: 2000 to 2010.

- The migration criterion adopted considers migrant the individual who lives in a region for less than 05 years, regardless of his place of birth.

(2) Database and methodology

- Characteristics of the sample:
  - Permanent households with a head individual.
  - Individuals aged between 15 and 69 years olds.
  - Internal migration.
  - Urban and metropolitan áreas.
  - Positive income values updated to 2017: INPC (National Consummer Price Index).

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Table 01 – Sample distribution by year (Brazil, 2000/2010)

Year	Frequency	Proportion (%)	Cumulative (%)
2000	5.550.410	45,67	45,67
2010	6.602.668	54,33	100,00
Total	12.153.078	100,00	

Source: elaborated by the author from the Brazilian Demographic Censuses 2000 and 2010.

Table 02 – Sample composition by group (Brazil, 2000/2010)

Year	Male	Female	White	Black/brown*
2000	3.361.527	2.188.883	3.241.425	2.308.985
	60,56	39,44	58,40	41,60
2010	3.802.033	2.800.635	3.445.322	3.157.346
(%)	57,58	42,42	52,18	47,82
	Non-Migrants	Migrants	Marital Status (stable union)	Head of household
2000	4.958.563	591.847	3.400.431	2.714.747
	89,34	10,66	61,26	48,91
2010	6.020.272	582.396	4.103.253	2.976.544
(%)	91,18	8,82	62,15	45,08
	Metropolitan region	Urban region	Formal Sector	Informal Sector
2000	2.511.082	3.039.328	2.326.375	3.224.035
	45,24	54,76	41,91	58,09
2010	2.733.155	2.869.513	3.666.633	2.936.035
(%)	41,39	58,61	55,53	44,47

Source: elaborated by the author from the Brazilian Demographic Censuses 2000 and 2010.
(*) Also includes indigenous and yellow individuals.

Obs.: 2010: 40,84% of migrants live in metropolitan areas.

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Table 03 – Sample composition by educational group (Brazil, 2000/2010)

Year	Illiterate	Elementary	High School	Undergraduate
2000	2.645.343	1.030.409	1.406.740	467.918
	47,66	18,56	25,34	8,43
2010	2.308.715	1.237.345	2.207.843	848.765
(%)	34,97	18,74	33,44	12,85
Non-Migrants				
2000	2.354.751	919.134	1.266.806	417.872
	47,49	18,54	25,55	8,43
2010	2.122.367	1.125.280	2.011.889	760.736
(%)	35,25	18,69	33,42	12,64
Migrants				
2000	290.592	111.275	139.934	50.046
	49,10	18,80	23,64	8,46
2010	186.348	112.065	195.954	88.029
(%)	32,00	19,24	33,65	15,11

Source: elaborated by the author from the Brazilian Demographic Censuses 2000 and 2010.

Table 04 – Sample composition by occupational group (Brazil, 2000/2010)

	2000	(%)	2010	(%)
leader	407.552	7,34	273.030	4,14
sciences/arts	368.661	6,64	674.734	10,22
technical	394.390	7,11	446.335	6,76
administrative services	483.049	8,70	484.702	7,34
services	1.354.977	24,41	1.313.440	19,89
trade	472.358	8,51	629.718	9,54
agricultural	323.037	5,82	202.719	3,07
production (G&S)	1.288.761	23,22	1.506.395	22,81
armed forces	52.247	0,94	16.146	0,24
others	405.378	7,30	1.055.449	15,99

Source: elaborated by the author from the Brazilian Demographic Censuses 2000 and 2010.

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Table 05 – Descriptive statistics (Brazil, 2000/2010)

	Mean	Std. Dev.	Min.	Max.
2000				
age	34,86	11,93	15	69
age2	1.357,32	913,66	225,00	4.761,00
wage	258,92	839,39	0,39	392.396,60
wage/hour	6,47	21,79	0,00	12.451,42
ln(wage/hour)	1,22	1,01	-5,49	9,43
2010				
age	36,50	12,29	15	69
age2	1.483,27	967,70	225,00	4761,00
wage	384,77	920,45	0,32	304.745,30
wage/hour	11,49	76,23	0,00	159.969,10
ln(wage/hour)	1,89	0,90	-5,98	11,98

Source: elaborated by the author from the Brazilian Demographic Censuses 2000 and 2010.

(2) Database and methodology

- First step:
  - logistic models are estimated to identify the probability to migrate and its main determinants.

$$Pr(y_{ij} = 1 | x, z) = \beta_0 + \beta_1 Z_{ij} + \varepsilon_{ij}$$

Table 06 – Interest variables – Part 01 (Brazil, 2000/2010)

Variable	Name	Description
migrant	Migrant	Dummy: 1 for migrant and 0 to non-migrant.
sex	Sex	*Dummy:* 1 for man and 0 to woman.
colour	Race	*Dummy:* 1 for white and 0 for brown and black.
age	Individual age	Age in years.
age2	Quadratic term of age	Age squared.
head_household	Head of household	*Dummy:* 1 for yes and 0 otherwise.
marital_status	Marital status	*Dummy:* 1 for positive marital status and 0 otherwise.
illiterate	0 to 7 years of schooling	*Dummy:* 1 for individuals with 4 to 7 years of education and 0 otherwise.
elementary	8 to 10 years of schooling	*Dummy:* 1 for individuals with 8 to 10 years of education and 0 otherwise.
high_school	11 to 14 years of schooling	*Dummy:* 1 for individuals with 11 to 14 years of education and 0 otherwise.
undergraduate	15 or more years of schooling	*Dummy:* 1 for individuals with 15 or more years of education and 0 otherwise.

Source: elaborated by the author from the Brazilian Demographic Censuses 2000 and 2010.

(2) Database and methodology

- Second step:

  – Wage determination equations (Mincer, 1974) are estimated to identify the returns to education, the returns to migration, and their interactions.

$$\ln\left(\frac{w}{h}\right) = \beta_0 + \beta_1[\boldsymbol{X}_i] + \beta_2[\boldsymbol{Y}_i] + \beta_3[\boldsymbol{Z}_i] + \beta_4\,[\boldsymbol{W}_i] + \beta_5\,[\boldsymbol{D}_i] + \varepsilon_i$$

  – $[\boldsymbol{X}_i]$ = vector of control variables; $[\boldsymbol{Y}_i]$= vector of schooling variables; $[\boldsymbol{Z}_i]$ = vector of locational variables; $[\boldsymbol{W}_i]$= vector of occupational variables; $[\boldsymbol{D}_i]$= vector of intercation variables.

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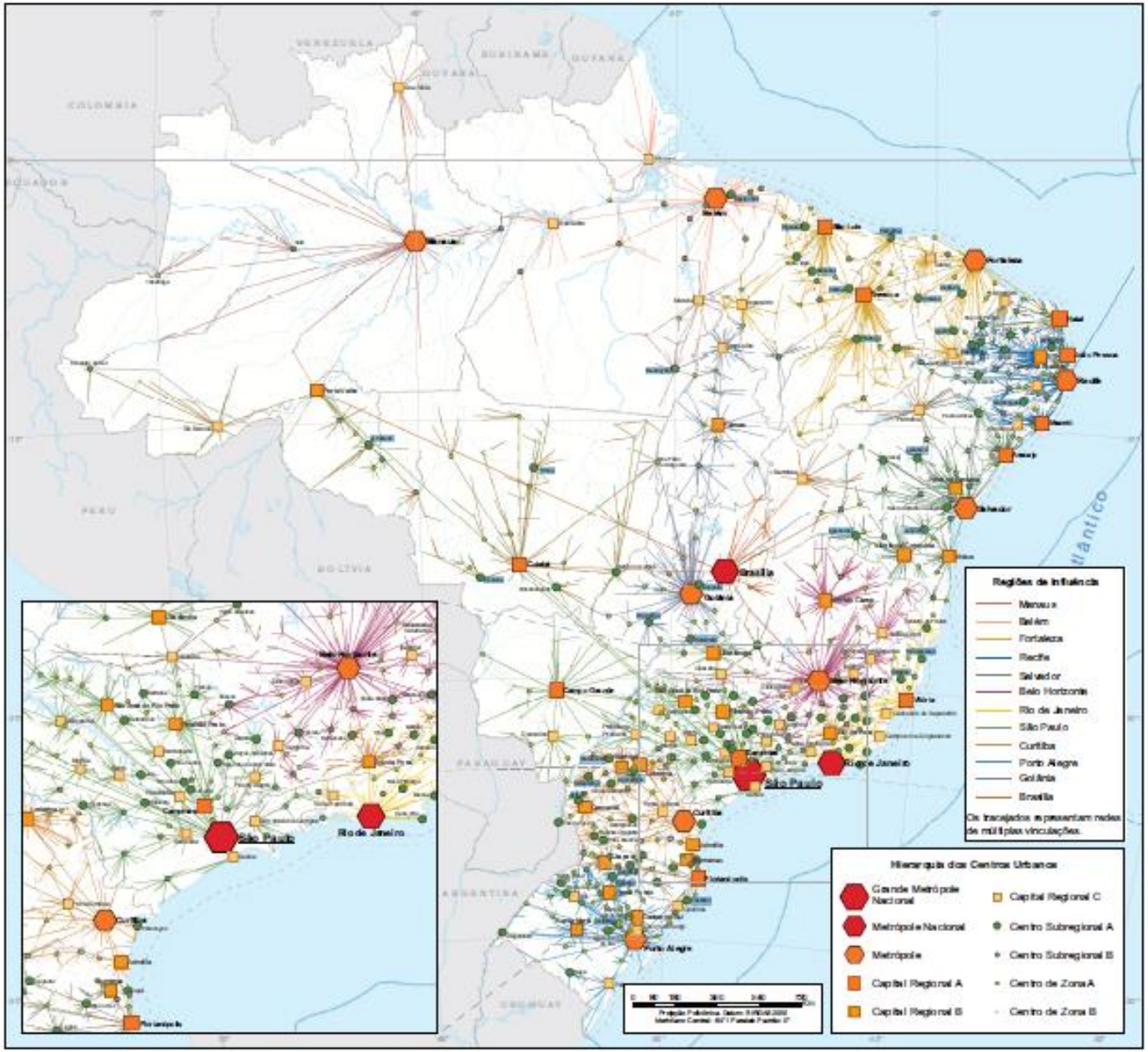
Table 07 – Interest variables – Part 02 (Brazil, 2000/2010)

Variable	Name	Description
ln(w/h)	Natural logarithm of the wage by hour	Indicates the value of the natural logarithm of the wage by hour.
pmigrant	Probability to migrate	Indicates the individual probability to migrate.
regic_i	Brazilian urban centrality	*Dummies variables:* 1 for urban centrality and 0 otherwise (10)
occupation_i	Occupational category	*Dummies variables:* 1 for a specific occupational category and 0 otherwise (10).
regic_schooling_i	Interaction - urban centrality and schooling	*Dummies* variables to indicate the interaction between schooling and residence in central areas (96).
regic_migrant_i	Interaction - urban centrality and migrant	*Dummies* variables to indicate the interaction between migration and residence in central areas (24).
regic_schooling_migrant_i	Interaction - urban centrality, schooling and migrant	*Dummies* variables to indicate the interaction between migration, residence in central areas and educational level (96).

Source: elaborated by the author from the Brazilian Demographic Censuses 2000 and 2010.

(2) Database and methodology

- Brazilian urban centrality:
  - Metropolis (1), divided into three categories:
    - Main national metropolis (A) -> São Paulo Metropolitan Region;
    - National metropolis 9B) -> Rio de Janeiro Metropolitan region & Brasília; e
    - Metropolis (C).
  - Regional capitals (2), divided into the categories A, B and C.
  - Sub-regional centers (3), divided into the categories A and B.
  - Zone centers (4), divided into the categories A and B.
  - Local centers (5) -> no centrality. (34% of the sample).



Source: IBGE, 2007

(3) Probability to migrate

- The results obtained show that:

- Migration is selective: specific individuals have a higher probability to migrate:

  - Men (8%).
  - White individuals (3%).
  - Individuals who have a stable marital relationship (30%).
  - Young people (5%).
  - Head of household (40%)
  - Individuals with high formal education (31%).

(4) Wage returns

- Non-productive and productive characteristics:
  - Wage returns for males are 23% higher than for females.
  - Wage returns for white individuals are 18% higher than for other individuals.
  - Wage returns increase 5% with age (and professional experience).
  - Wage returns are 65% higher for leadership occupations; 48% for professionals of Science and arts; 16% for formal sector.
  - Wage returns are negative for agricultural occupations (-26%) and traditional services (-11%).

(4) Wage returns

- Metropolitan wage returns:
  - Wage returns are 24% higher in metropolitan areas (metropolitan wage returns).
- Urban centrality and wage returns (model 01):
  - Main National Metropolis: 57%.
  - National Metropolis: 50%.
  - Metropolis: 32%.
  - Regional Capitals: A (37%), B (35%), C (28%).
  - Sub-regional Capitals: A (22%), B (16%).
  - Zone centers: A (16%), B (6%).

(4) Wage returns

- Returns to migration:
  - Wage returns for migrants (returns to migration) are 9% higher than for non migrants.
- The returns to migration are more expressive at (model 02):
  - Main National Metropolis: 32%.
  - National Metropolis: 28%.
  - Metropolis: 14%.
  - Regional Capitals: A (18%), B (17%), C (15%).
  - Sub-regional Capitals: A (9%), B (9%).
  - Zone centers: A (9%), B (1,5%).

(4) Wage returns

- Returns to education:
  - Wage returns for individuals with 15 years or more of schooling (returns to schooling) are 84% higher than for other individuals.
- The returns to education are more expressive at (model 03):
  - Main National Metropolis: 81%.
  - National Metropolis: 96%.
  - Metropolis: 65%.
  - Regional Capitals: A (65%), B (44%), C (42%).
  - Sub-regional Capitals: A (30%), B (27%).
  - Zone centers: A (22%), B (9%).

(4) Wage returns

- Returns to migration of human capital (Wage returns for migrants with 15 years or more of schooling are more expressive at):
  - Main National Metropolis: 46%.
  - National Metropolis: 61%.
  - Metropolis: 30%.
  - Regional Capitals: A (32%), B (19%), C (24%).
  - Sub-regional Capitals: A (17%), B (15%).
  - Zone centers: A (12%), B (2,5%).
- Returns to migration of human capital are negative at:
  - Local centers: -9%.

Final remarks

- The analysis of the returns to migration and the returns of education demonstrates:
  - Existence of expressive wage premiums in Brazil related to urban hierarchy, high propensity to migrate and high level of education.
  - Urban and metropolitan infrastructure and diversity.
  - Selectivity of the migration process.
  - Low educational level of the Brazilian population.
  - Large regional disparities versus particularities of wage returns to migrants and human capital: importance of the local productive diversification.

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Thank you!

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