

* Social Economics and Public Policy – Marcelo Neri



Cohort Analysis

Long-Term Mobility: A Life-Cycle Perspective

Brazilian Population Profile Across Decades

Brazilian Population Portrait (%)

	1950	1970	2000	2010
<i>Total</i>	100	100	100	100
Sex				
<i>Male</i>	49,83	49,87	49,21	48,97
<i>Female</i>	50,17	50,13	50,79	51,03
Age Group				
<i>0 to 9</i>	29,62	29,94	19,40	15,08
<i>10 to 19</i>	22,74	23,64	20,78	17,91
<i>20 to 29</i>	17,56	15,37	17,65	18,01
<i>30 to 39</i>	12,10	11,49	14,89	15,53
<i>40 to 49</i>	8,40	8,62	11,35	13,02
<i>50 to 59</i>	5,10	5,66	7,37	9,65
<i>60 or more</i>	4,25	5,13	8,56	10,79
Color or race*				
<i>White</i>	61,66		53,74	47,73
<i>Black</i>	10,96		6,21	7,61
<i>Yellow</i>	0,63		0,45	1,09
<i>Brown</i>	26,54		38,88	43,13
<i>Ignored</i>	0,21		0,71	0,43
City Size				
<i>Urban</i>	36,16	55,41	82,73	84,36
<i>Rural</i>	63,84	44,59	17,27	15,64

Source: FGV Social from Demographic Census

* Information not available in 1970

← 2000s Inversion

←Biggest change

COHORT ANALYSIS: LOOKING ACROSS GENERATIONS

- Cohort data are imperfect substitutes for longitudinal data since they do not provide information about the same individuals over time. In fact, cohort data presents information from different individuals with a certain set of identical characteristics, such as year and place of birth, gender and race.
- These data have some advantages over panel data. The first is that there is no friction problem in the sample, that is, one can usually observe individuals from the same cohort in different years, which is simpler than observing the same individual over time. Moreover, since the cohort information refers to the mean or other moment of the distribution, the possibility of measurement error coming from the information of the same individual accompanied at different times is reduced. Another advantage comes from the possibility of using more than one database at the same time. Longitudinal data are rare.
- An analysis based on pseudo-panels presents two potentially problems. The first is in the choice of attribute to analyze, which has to be fixed. There are attributes that change over time, such as the position of the individual in the family. For example, one who occupies the position of head of the family in this decade did not necessarily occupy the same position in previous decades (also the social convention may have changed). Therefore, we must choose fixed characteristics, such as gender and race. The second problem is that there are mortality differentials between the characteristics analyzed, such as men and women, whites and blacks, poor and non-poor.

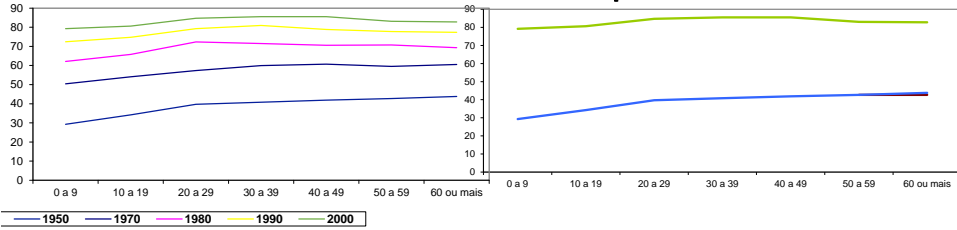
Migration Rural/Urban

We will introduce the **idea** cohort analysis by studying the migratory movements of the Brazilian population. Below we have a view of the changes occurred at two points in time, 1950 and 2010. This type of chart allows us to capture two types of effect: first, the age effect, evaluating how the migratory process varies from a life cycle perspective, that is, we analyzed different ages in the same year (and consequently different generations). In particular, we compared the group with 0 to 9 years old in 1950 with other age groups in the same year. Then, to capture the **simple** year effect, we confronted the population in 2010 with that of 1950, focusing on the same age group in **different** years (and **consequently** different generations). For example, we compared the group with 0 to 9 years in 2010 with the same age group in 1950.

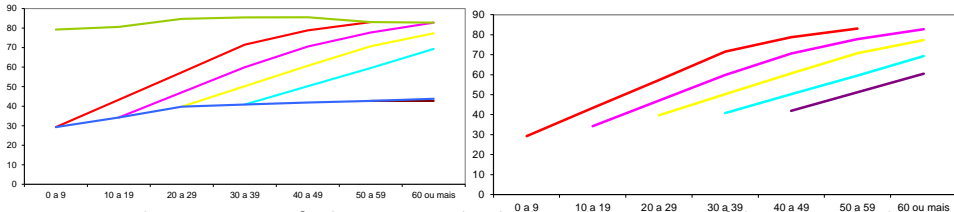
Age/Year->	1950	1970	1980	1990	2000	2010
0 a 9	29,27	50,45	62,11	72,45	79,24	81,47
Migration within Brasil - 1950 to 2010	34,24	54,11	65,77	74,73	80,63	81,96
% População Urbana	39,74	57,35	72,36	79,28	84,71	85,82
	40,85	59,95	71,53	80,91	85,51	86,35
	41,88	60,72	70,54	78,84	85,55	86,02
	42,69	59,56	70,71	77,76	83,07	85,43
60 ou mais	43,81	60,57	69,32	77,34	82,82	84,14

Constructing Cohorts - Graphs

% Share of Urban Population

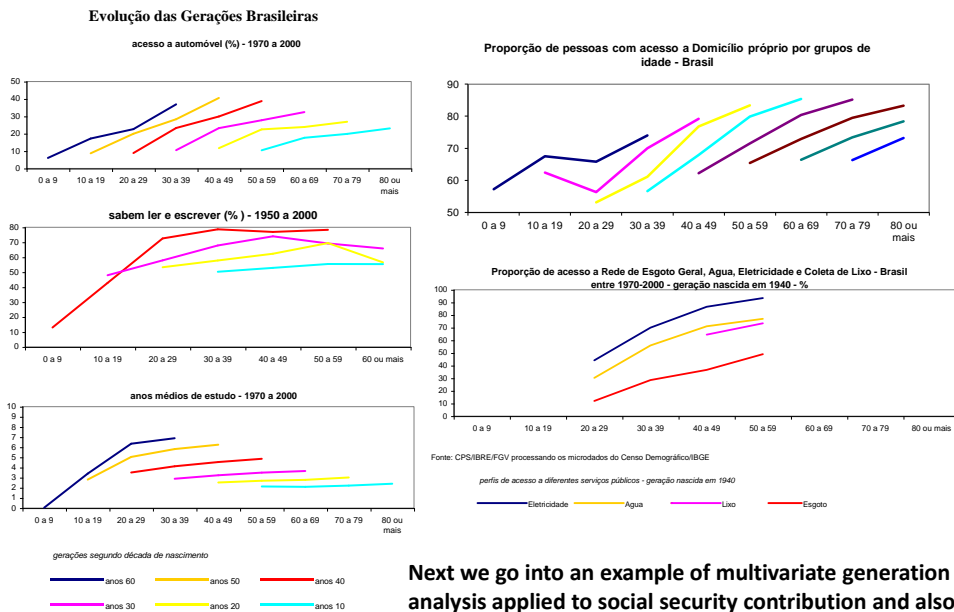


Then we can combine the two points in time (1950 and 2010) to evaluate migratory changes in generational terms (or simple cohort effects), that is, we follow the same generation, in different years and ages. Here we will focus on those born in the 1950s and arriving in 2010 aged 50-59.



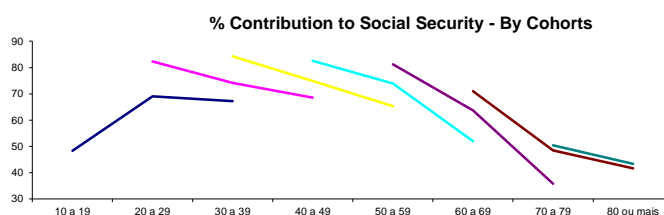
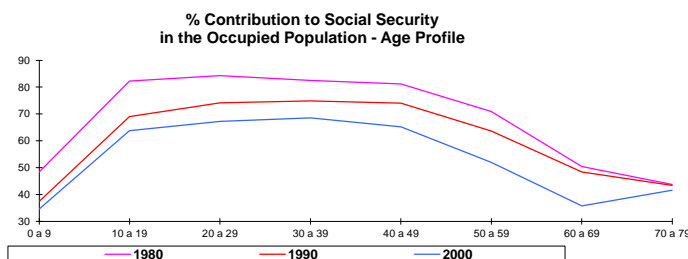
Variations in the proportion of urban citizens clearly show the presence of the year and cohort effects. After five decades, the Brazilian population that was essentially rural became urban, a result observed at all ages and generation. There is temporal dominance in both dimensions.

Other Examples: Physical Assets & Human Capital



Next we go into an example of multivariate generation analysis applied to social security contribution and also self-reported ethnicity (race): Cohorts & Color

Other Example: Evolution Social Security Contribution: by Age and By Generations



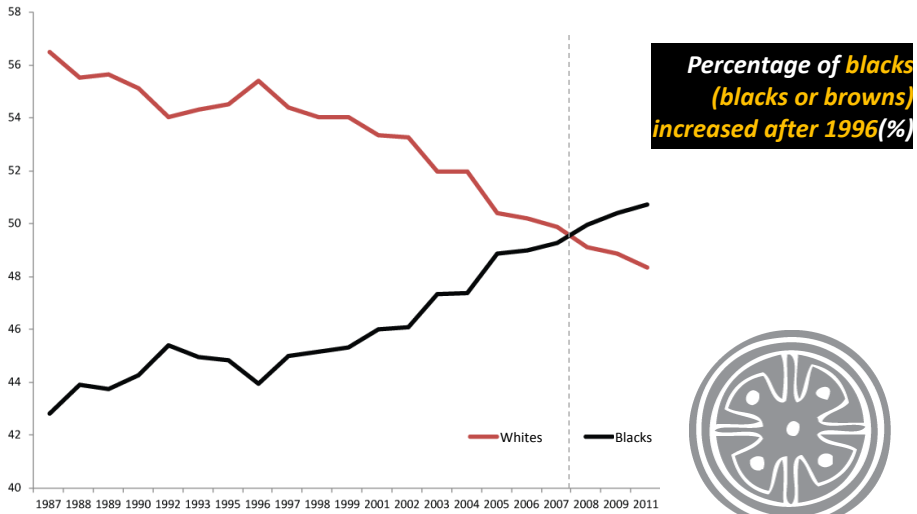
Dive into
Informality Years

Source: Demographic Census microdata/IBGE 1980, 1991 e 2000

Cohorts in a Logistic Regression - Brazil Population that Contributes to Social Security

Parameter	Level	Estimate	StdErr	estat_t	sig	cond
1Intercept		1.1200	0.0065	171.370**		3.06489
2coorte	1941-1950	-0.6239	0.0031	-201.843**		0.53585
3coorte	1951-1960	-1.3070	0.0048	-271.195**		0.27063
4coorte	1961-1970	-2.2372	0.0068	-330.889**		0.10676
5coorte	1971-1980	-3.2279	0.0087	-369.189**		0.03964
6coorte	1981-1990	-5.4713	0.0139	-394.889**		0.00421
7coorte	1991-2000	0.0000	0.0000	.		1.00000
8coorte	ZAbaixo de 1940	0.0000	0.0000	.		1.00000
9fxage	0 a 9	-13.5147	68.2584	-0.198		0.00000
0fxage	10 a 19	0.4978	0.0044	112.170**		1.64510
1fxage	20 a 29	0.6781	0.0025	274.839**		1.97021
2fxage	40 a 49	-0.7808	0.0028	-282.786**		0.45802
3fxage	50 a 59	-1.3194	0.0040	-326.831**		0.26730
4fxage	60 a 69	-1.9427	0.0051	-382.692**		0.14331
5fxage	70 a 79	-2.4942	0.0075	-332.218**		0.08256
6fxage	80 ou mais	-2.5738	0.0187	-137.501**		0.07624
7fxage	Z30 a 39	0.0000	0.0000	.		1.00000
8manoest		0.0463	0.0026	17.776**		1.04735

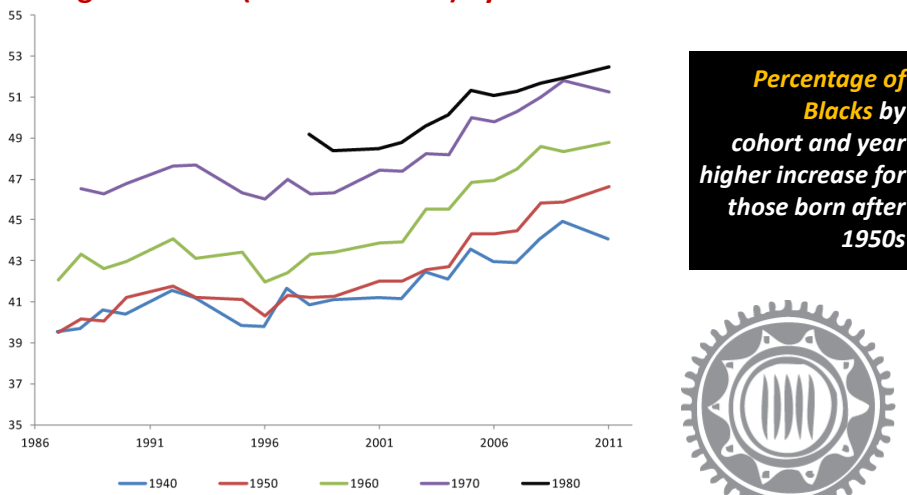
Controls: sex, education, household position (e.g.: chief, spouse etc.), religion, marital status, size of the city and macro-region Source: Microdata from Census 1980, 1991 e 2000
<http://www.fgv.br/ibrecps/informalidade/INF/Espelho/PREVI/PREVI.htm>



Source: PNAD/IBGE microdata



Percentage of Blacks (blacks+browns) by Cohorts Across Years



Source: PNAD/IBGE microdata



