

OBJECTIVES

- ✓ Improve migration techniques, proposing a new age-specific emigration rate (ASER) calculation, which can be applied to different countries and databases.
- ✓ Analyze migration patterns and levels between the states of Bahia and São Paulo, by age group and sex, for the periods 1975-1979, 1986-1990, 1995-1999.

DATA

- ✓ 1980, 1991 and 2000 Brazilian Censuses were used to replicate previous techniques to estimate migration schedules and to check the new one. Those estimates were applied to the migration between the Brazilian states of Bahia and São Paulo.

AGE-SPECIFIC NON-EMIGRATION RATE

$$ASNER_{x,ij} = 1 - ASER_{x,ij}$$

TOTAL NON-EMIGRATION RATE

$$TNER_{ij} = ASNER_{0,ij} * ASNER_{5,ij} * ASNER_{10,ij} * ... * ASNER_{85+,ij}$$

TOTAL EMIGRATION RATE

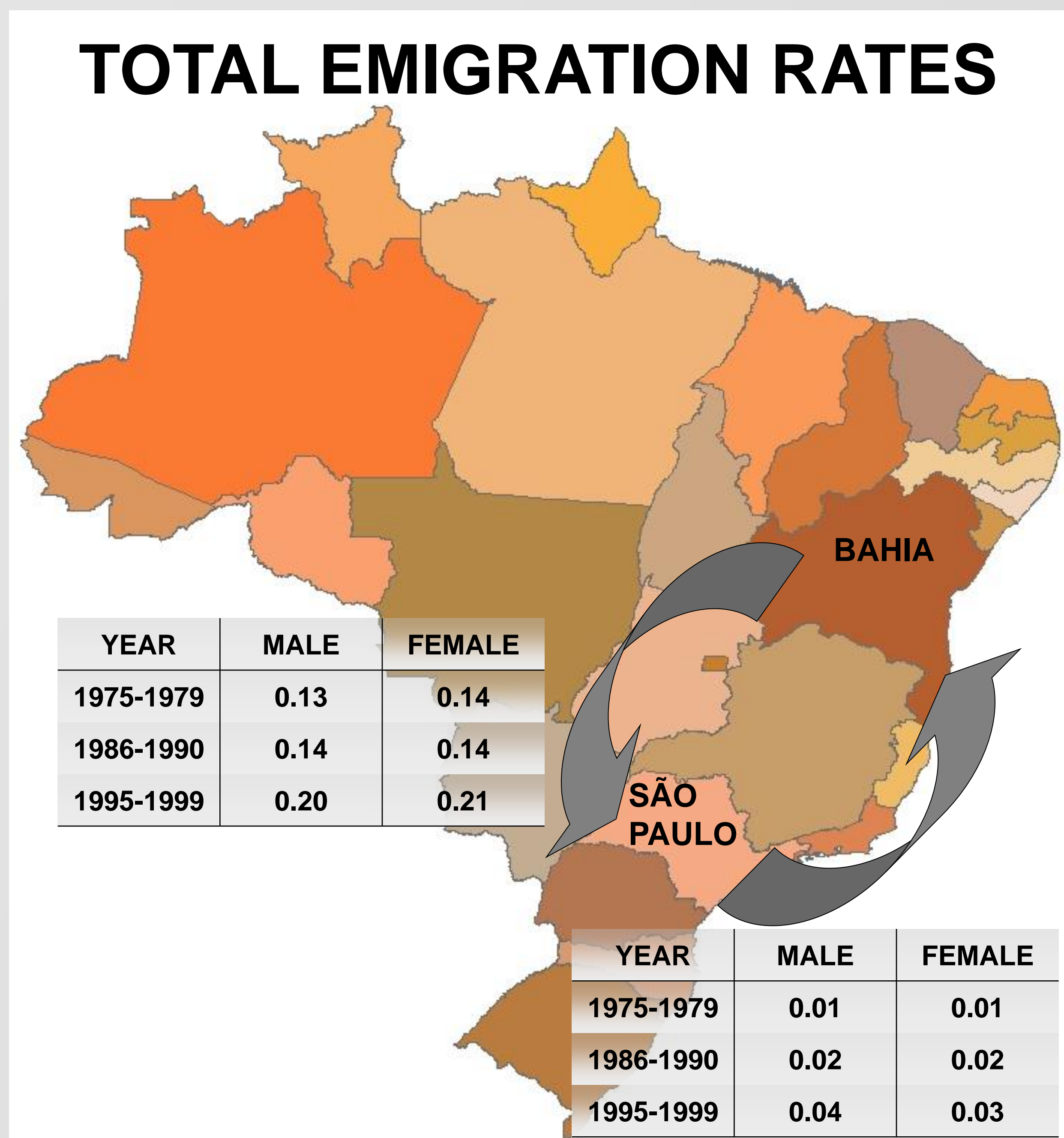
$$TER_{ij} = 1 - TNER_{ij}$$

LIMITATIONS OF 2000 CENSUS

- ✓ Some LIMITATIONS are encountered in Brazilian 2000 Census related to information on previous place and duration of residence.
- ✓ Information about MUNICIPALITY OF PREVIOUS RESIDENCE is no more available. Only state or country of previous residence is available. Therefore, it will not be possible to estimate intra-state rates of emigration. In Census of 2000, intra-state analyzes can be made using information of residence at a fixed prior time.
- ✓ The development of another technique to estimate the intra-state RATES BETWEEN ZERO AND FIVE YEARS OF AGE will be needed in future studies.
- ✓ Even with these difficulties using 2000 Census, Machado's technique is highly useful. This kind of research can be utilized by several researchers around the world. The development of migration techniques will be possible by using real data. New techniques might arise to increase the results obtained by research in this area.

MIGRATION ANALYSIS

- ✓ The main results for the migration between Bahia and São Paulo suggest higher migration levels from Bahia to São Paulo than the opposite direction.
- ✓ More industrialized areas attract more female than male migrants, which might be explained by the existence of more opportunities of insertion into the labor market for women.
- ✓ Migration to São Paulo is more concentrated in labor ages.
- ✓ Migration to Bahia presents rates more uniform across all age groups, which suggest a familiar migration.



TECHNICAL DISCUSSION

- ✓ The technique developed by Machado (1993) is very important for demographic analysis. Migrant patterns can be evaluated through the shape of proportional estimated curves. Migrant levels are examined by the "Total Emigration Rate" (TER).
- ✓ The estimation of migration rates can be conducted in two different ways:
 - One estimation utilized questions on previous place and duration of residence. This procedure is the technique developed by Machado (1993). This kind of migration information is furnished by censuses data.
 - The other estimative of migration probabilities utilized questions about residence at a fixed prior time. This technique is a direct way to estimate migration rates. This information was first gathered in the 1991 Census and following in the 2000 Census. However the migration rates were not estimated using this direct technique.

FORMULA CORRECTION

- ✓ Some CORRECTIONS need to be applied to Machado's technique (1993), because his formula presented some errors.
- ✓ In the DENOMINATOR of the formula, some changes were applied. It is essential that the component of emigration be added in the denominator.
- ✓ WEIGHTS need to be changed to improve results.
- ✓ In the NUMERATOR, a specific change must be realized. Children between zero and five years of age need to have special weights. This correction adds the indirect effect of migration. This procedure prevents the underestimation of migration rates on these early ages.

AGE-SPECIFIC EMIGRATION RATE

$$ASER_{x,ij} = \frac{\sum_{t=0}^4 K_{t,ij}}{0.5K_{0,i} + 1.5K_{1,i} + 2.5K_{2,i} + 3.5K_{3,i} + 4.5K_{4,i} + 4.5K_{0,i} + 3.5K_{1,i} + 2.5K_{2,i} + 1.5K_{3,i} + 0.5K_{4,i} + 5K_{nm,i}}$$

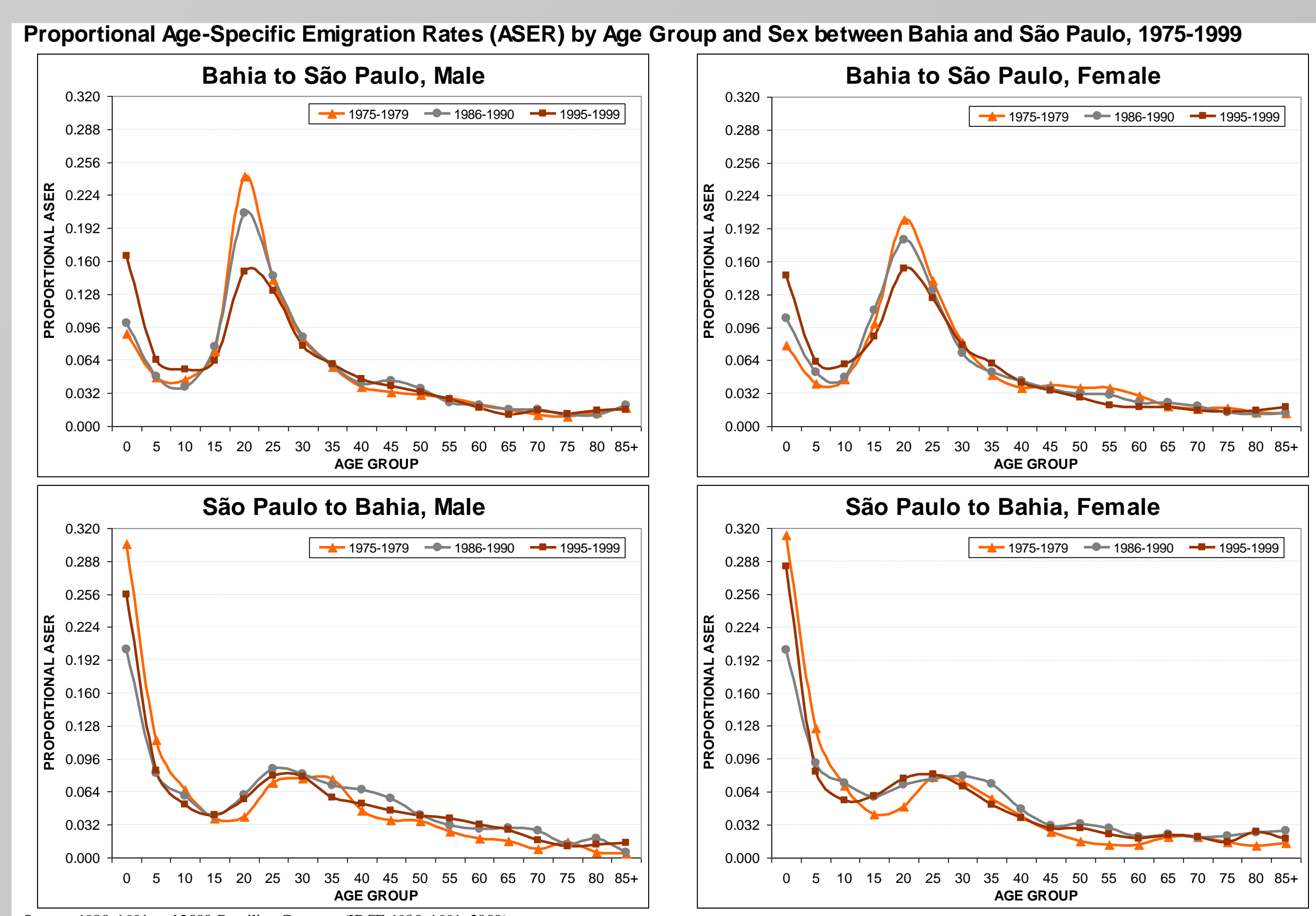
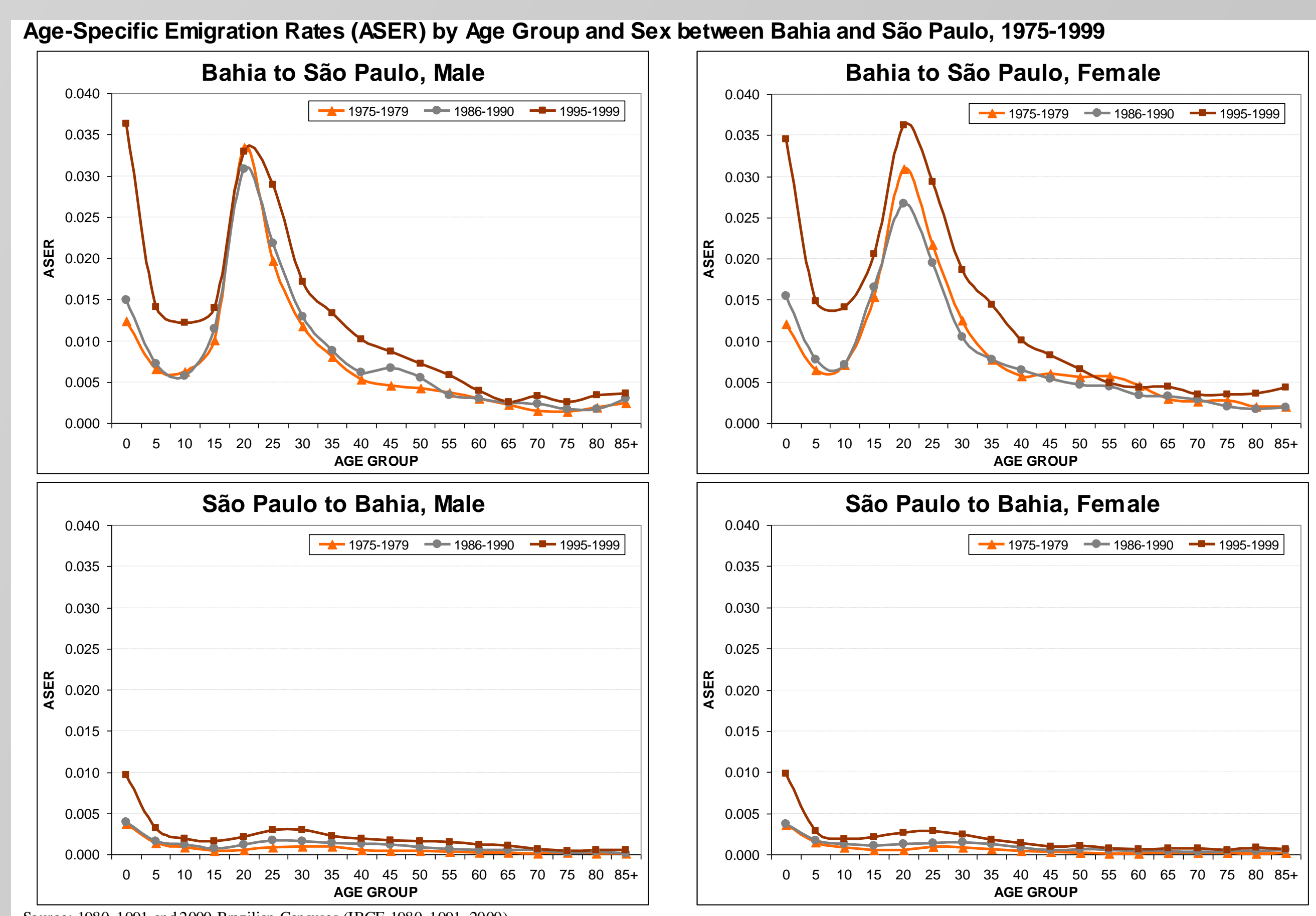
$ASER_{x,ij}$: AGE-SPECIFIC EMIGRATION RATE from region i to region j , in age group x .

$K_{t,ij}$: MIGRANTS who moved from i to j in time t , which is the number of years of residence in the region of interview.

$K_{k,i}$: sum of migrants who moved from k regions to i regions in time t . It measures the number of person-years of IMMIGRANTS who are now at the risk of migrate from the new region of destination.

$K_{i,i}$: sum of migrants who moved from i regions to k regions in time t . It measures the number of person-years of EMIGRANTS who were at the risk of migrate from the region of origin (i).

$K_{nm,i}$: residents in i at the end of the period who already were living in i at the beginning of the period (nm =NON-MIGRANTS).



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