

Fertility differentials from rural/urban migration in Brazil: an analysis using cohort fertility

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Abstract

Compared to developed regions of the world, the Demographic Transition in Brazil occurred rapidly, first characterized by the decline of the mortality rate, and then followed by the reduction of fertility. Despite being well documented, there are still some gaps to be explored concerning the reasons behind this fertility decline, especially the relationship between internal migration and fertility. This study aims to analyze fertility's differentials according to the migration status of women over the age of 40 years old. Using data of the Demographic Censuses from 1970, 1980 e 1991, we reconstruct cohort fertility over a period before the Demographic Transition started. The aim is to analyze the relationship between migration status and cohort fertility levels. Results indicate expressive cohort fertility's differentials among migrant's categories, indicating that the countries internal migration process played an important role in determine the past levels of fertility. The effects of communication and learning process carried out by migration flows may explain these cohort fertility differentials.

Keywords: Fertility rate differentials, migration, Brazil

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Introduction

In the consulted demographic literature, there are four hypotheses that examined for the relationship about migration flows and fertility levels. These explanations are summarized in four behaviors, the migrant's adaptation, socialization, disruption, and selectivity process (Ribe and Schultz 1980). The adaptation hypothesis assumes that the migrant will adapt to the customs in the place of destination, quickly converging to the same reproductive behavior of the non-migrant in the destination. About the socialization hypothesis, the migrant women would remain with the fertility patterns of their places of origin, but future generations would incorporate reproductive behavior of the new destination (Hervitz, 1986). The hypothesis of selectivity assumes that migrants are composed by a selected group, with different characteristics from those women of who did not migrate (Ribe and Schultz, 1980). In this way, women with a preference for smaller families tend to migrate to low fertility regions. Therefore, the migrants would have the same fertility intentions as the non-migrants in the destination, not because they adapt, but because they already have preferences for smaller family's sizes (Kulu, 2003). Finally, the disruptive hypothesis explains that the fertility of migrants, immediately after the arrival at the destination, will be less than that of non-migrants in the destiny location. The reasons here are linked to psychological stress of change home and breaking ties family members and friends who remained at the place of origin. According to this explanation yet, after an adaptation period, fertility is expected to gradually return to higher rates (Hervitz, 1986).

Jensen and Ahlburg (2004), Goldstein and Goldstein (1981, 1983), and many other studies have explored the relationship between migration and fertility from different countries. In Brazil, there are few studies in this line, but many restrict to some cities or states in the country. For example, Iutaka et al. (1971) analyzed the fertility of natives and migrants from Brazilian urban regions, more specifically in the cities of São Paulo, Rio de Janeiro, Belo Horizonte, Juiz de Fora, Volta Redonda, and Americana. According to the authors right after the migration, the fertility of the place of destination tends to increase, but, after an adaptation process, the migrant women assimilate the reproductive characteristics of the natives, in turn, after a while their fertility tend to decrease. Additionally, the migration process affects both

migrants and natives, whether in rural-urban or inter-regional migration (Iutaka et al., 1971).

Boccucci and Wong (1998) also analyzed the relationship between fertility and migration in the Federal District of Brazil. The objective of the work was to study the reproductive behavior of migrants in the Federal District and compare it with women living in the place of origin (Northeast, Minas Gerais and Goiás) of the migrants, seeking to understand whether migration causes changes in fertility or if there are selective characteristics of migratory flows. For this, the authors use two analytical approaches: cross-sectional measures to establish the level and pattern of fertility and longitudinal measures with the cohort data to accompany the cohorts of women. The TFR (total fertility rate) of residents at origin was higher compared to that of migrants. When compared to the time of residence, recent migrants (less than 2 years of residence) have lower TFR than migrants with a medium time of residence (3 to 9 years of residence). However, older migrants (between 10 and 19 years of residence) have a lower TFR than medium-time migrants. These results indicate a great chance of occurrence of the disruptive hypothesis, that is, migrants would have low fertility right after the act of migrating. However, after a while the migrants would adapt to their destination. About the CFR (cohort fertility rate), migrants had lower rates compared to non-migrants of origin and a higher timing among parity, however this difference reduces with the increase in the residence time of migrants (Boccucci and Wong, 1998).

Signorini (2017) analyzed Northeastern women immigrants in São Paulo, comparing their fertility levels with non-migrants born in the state of São Paulo and non-migrants born in Northeastern, divided into five comparative groups: 1) born in Northeast and interstate immigrants in the state of São Paulo; 2) born in Northeast, with more than five years of residence in São Paulo, and intermunicipal non-migrants; 3) born in Northeast, intermunicipal migrants in São Paulo; 4) intermunicipal non-migrants, residents and natives of state of SP; 5) non-migrants and natives of the Northeast. She found evidences of rupture and adaptation hypothesis due to migrants with a longer time of residence assimilating the behavior of the women born in destination (SP). However, the differences in fertility level between these five groups decrease over time, that is, the behavior of migrants becomes closer to non-migrants in the destination.

This study takes a broader approach and aims to analyze historical fertility differentials about migrants and non-migrants in Brazil and its regions. First, we do a comparative analysis, considering the place of residence of women (rural versus urban locations), comparing with those that did not migrate with the women that has changed residence, during each year considered. This comparison allowed us to analyze how the migration affected the fertility rates in the process of the demographic transition. We also performed analyses controlling for regional differences.

1. Contextualizing urbanization and fertility differentials by the household situation

Brazil experienced one of the most accelerated urban transitions in history, transforming an agricultural country into an urban one (Martine and McGranahan, 2010). This rapid urbanization process resulted in an enormous social and economic differential between the population. Migration as an alternative to better jobs, education, among other reasons directly impacts an individual's life course, whether for financial reasons, processes of adaptation, or distancing from the family. Therefore, when analyzing the fertility transition, it would be incomplete not to consider migration as one of the decision factors for choosing the number of children.

For this study, rural-urban migration was considered as a starting point, based on fertility differentials between rural and urban areas. Rural fertility rates, in 1970, were almost three more children than urban fertility, as shown in Table 1. Between 1970 and 1980, urban fertility showed a higher reduction than rural fertility, however, between 1980 and 1991, the decrease was approximately 30% in both household situations.

Table 1: Total fertility rates according to the household situation – Brazil (1970 - 1991)

Year	Urban	Rural
1970	4.6	7.7
1980	3.6	6.4
1991	2.5	4.4

Sources: IBGE, Brazilian Population Censuses, 2004, p.83

This reduction in fertility rates was directly impacted by the urbanization process with the migration of the population from rural areas to urban areas . This movement may have affected the course of fertility decline, resulting in differences in rural and urban fertility. When analyzing the scope of the adaptation hypothesis, migrant women from rural areas to urban areas would adapt to the reproductive behavior of urban women, favoring a faster fall in total fertility in the urban region, especially if we consider that urban fertility in 1970 was already much smaller than the rural one. On the other hand, the selectivity hypothesis shows that the decision to migrate comes from a group already selected with its own characteristics and not chosen at random. In other words, they tend to look for places of destination closer to their characteristics.

2. Data and Methods

We use the Brazilian micro-censuses data from 1970, 1980, and 1991, collected at IPUMS⁴ - International. The methodology used was a comparative analysis based on the cohort fertility data, according to the women migratory status. The information on the household situation and the situation of the previous residence, enabled us to construct different groups of migrants and non-migrants, like women who did not migrate from rural or urban areas, and those who change resident from rural to urban, urban to rural, rural to other rural or urban to other urban destination. We select women aged 40 or more years old in each census, this selection corresponds to women who have already reached their final stage of the reproductive cycle. For the analyses, we use as reproductive information the number of children ever born. The CFRs were obtained using the equation 1:

$$CFR_t = \frac{Chborn_t}{w_t} \quad (1)$$

Where,

- CFR_t : Cohort Fertility Rates for cohorts of women born in time t,
- $Chborn_t$: Children Ever Born to cohorts of women born in time t,

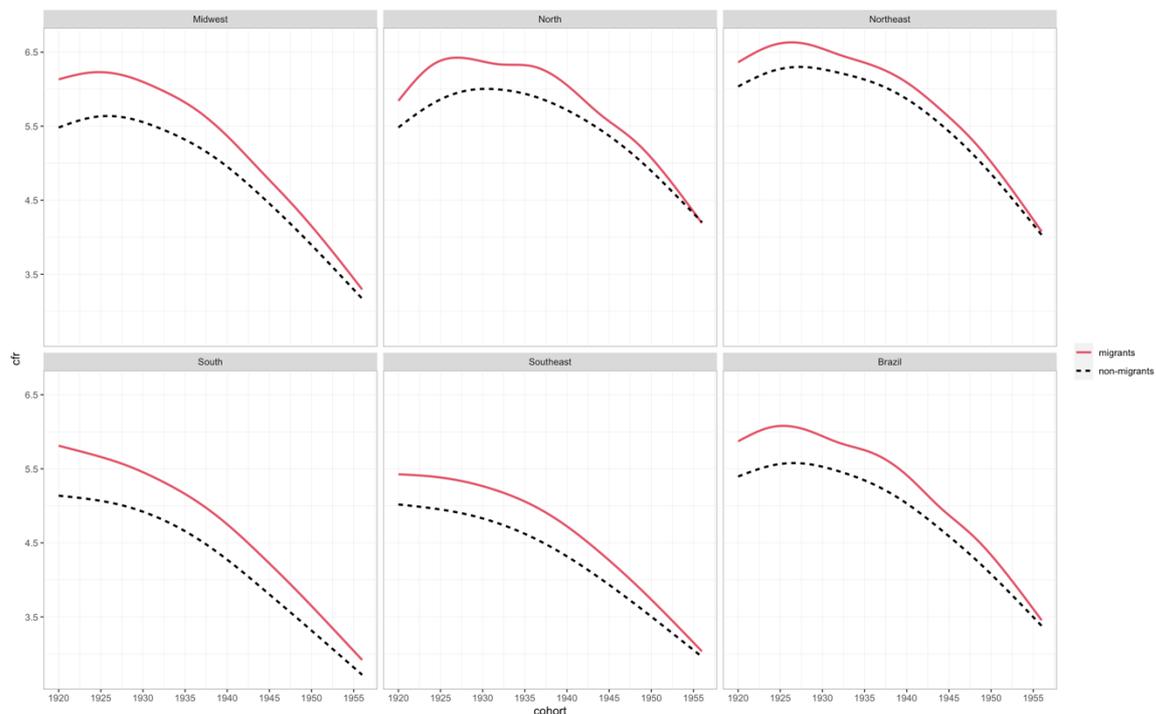
⁴ IPUMS - Integrated Public Use Microdata Series

- w_t : Total number of women from the cohort born in time t .

3. Results

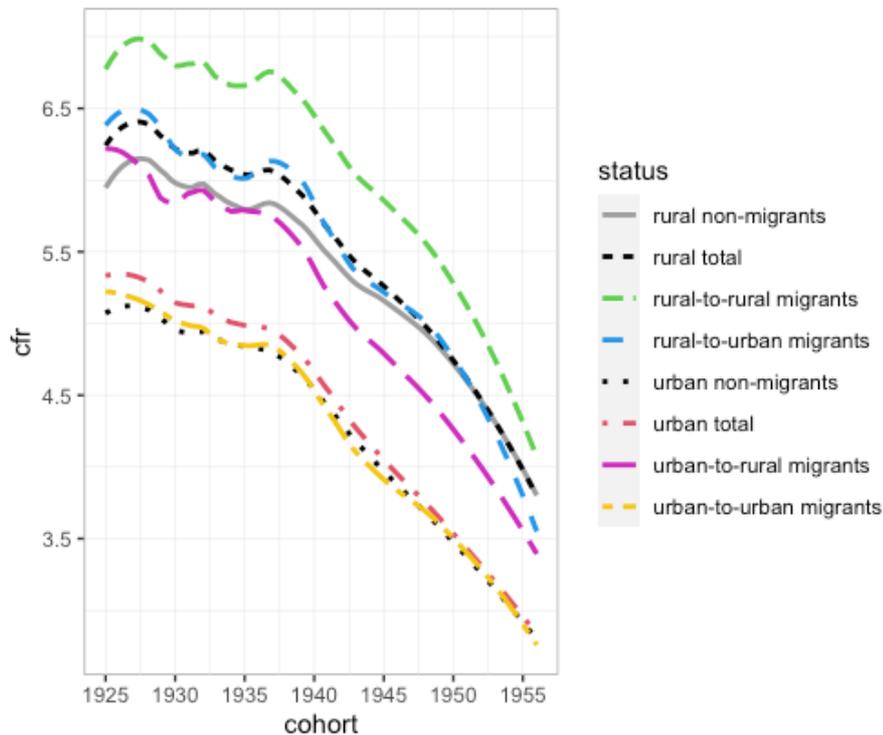
Figures 1 and 2 show some results about the fertility differentials according to the migratory status in Brazil. Here, we try to compare the categories of migrants and the cohort fertility rate in each age group. An important result was the decrease in fertility differentials between the groups analyzed over the years. It was already expected, based on the literature, that fertility would show a reduction in all groups quickly, and concurrently. Hence, the migratory effect on the fall in fertility over the years, but still have some differences. Both urban non-migrants and urban-urban migrants had a much lower fertility than the other groups, even before cohort 1935, a year considered a milestone for the fertility transition in Brazil. Rural-rural migrants, throughout the analyzed period, had the highest fertility levels, but they showed a large drop after the 1940 cohorts. As expected, the highest fertility levels were women from rural regions. Women who have migrated from rural to urban areas have reproductive behavior very similar to rural non-migrants. The urban-rural migrants had a reproductive behavior situated between that of the rural non-migrants and urban non-migrants, just as Lerch (2018) found for developing countries.

Figure 1: Cohort Fertility differentials from in-migrants and non-migrants, Brazil



Sources: Brazilian Population Censuses 1970, 1980, 1991. Minnesota Population Center (2020)

Figure 2: Cohort Fertility differentials from in-migrants non-migrants, by types of migration, Brazil

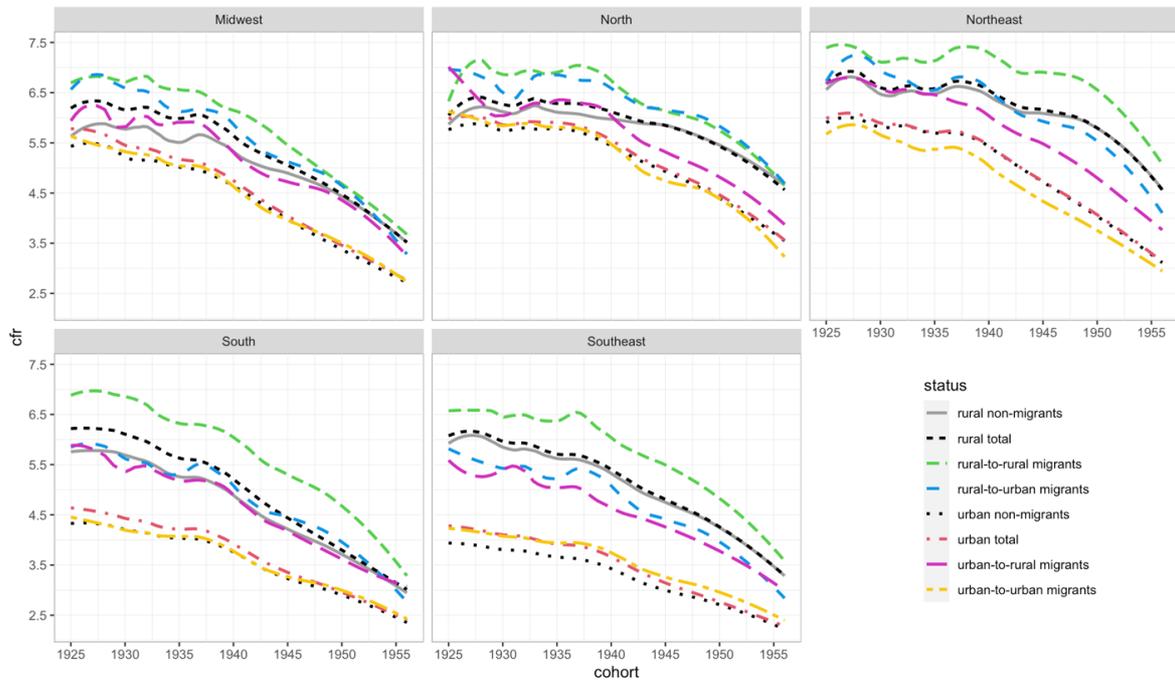


Sources: Brazilian Population Censuses 1970, 1980, 1991. Minnesota Population Center (2020)

We try to understand better these differences disaggregating our analysis according to regional levels (Figure 3). We found a reduction in fertility differentials by migratory status. However, this reduction was different between regions. Southeast and South show the higher fertility differentials but reducing over the years. On the other hand, North and Northeast had more similar cohort fertility rates, and also, their fertility differentials increased over the years. One plausible explanation for this increase could be related to the drop in urban fertility faster than rural fertility, given that the urbanization process in Brazil was heterogeneous (Vergolino and Dantas 2005), or a stronger effect of migration in these two regions. However, the indirect effect of migration on fertility also depends on the level of urbanization in each region, that is, a high level of urbanization reduces the proportion of the migrant population between household situations (Lerch, 2019). In Brazil, the urbanization process may explain, in part, the fertility differentials found in this article. The Southeast and the South were the most urbanized regions with emphasis on the states of Minas Gerais and São Paulo due to the rural exodus

(Martine 1994). This may be the reason for the fertility differentials between the types of migrants being more evident in those regions.

Figure 3: Cohort Fertility differentials from in-migrants and non-migrants, by Brazilian regions, births cohorts 1920-1956



Sources: Brazilian Population Censuses 1970, 1980, 1991. Minnesota Population Center (2020)

In figure 4, we illustrate the Brazilian regional division through a map for the reader's understanding. The Southeast was the first to present a significant drop in the fertility rates in 1960 and was a destiny region for many migrants. This observation is consistent with the fact that it is the year of a milestone for the fertility transition in Brazil. In addition, the results show that migration could probably impact the reproductive behavior of a region, slowing the decline in fertility. At first, migration can slow the decline in fertility, and, after a period of residence in the destination, they can assimilate the reproductive behavior of the natives, but as seen, it will still be slightly greater when compared to non-migrants from urban areas.

Figure 4: Map from Brazil

These preliminary results found a possible selectivity, for example, the women who remained in rural areas showed fertility below the migrants from rural to other rural or urban location. This may be a suggestion of selectivity, even due to the decision to migrate, that is, migrants are self-selected and part of a non-random sample (Majelantle and Navaneetham 2013). Ribe and Schultz (1980) claim that migrants with a preference for fewer children tend to relocate in urban areas and migrants with preferences for larger families choose rural areas, choosing destinations that favor their behavior patterns. Furthermore, women who were in the urban areas and migrated to rural areas have a higher fertility rate than those who did not migrate (rural area) or made the migratory movement between urban areas. Again, this behavior could be linked to selectivity.

Looking at Figures 2 and 3 one can see that after the 1935 cohort of birth, fertility differentials reduced for all groups. This observation is coherent with the fact that it is the year of a milestone for the fertility transition in Brazil. In addition, the results show that migration could probably impact the reproductive behavior of a region, slowing the decline in fertility. At first, migration can slow the decline in fertility, and, after a period of residence in the destination, they can assimilate the reproductive behavior of the natives, but as seen, it will still be slightly greater when compared to non-migrants from urban areas.

4. Discussion

About Demographic Transition, much is discussed about mortality and fertility, but less about the relationship between migration with these two variables. Migration is a mechanism that can influence spatial redistributions and change the dynamics of a society (Boccutti and Wong, 1998). In the literature, it is already known that the demographic transition process in Brazil was faster than in developed countries, but it is not known whether migration played any role in making this happen. For Goldstein and Goldstein (1983), the few existent works show the complexity of the theme. Hervitz (1986) already said that the relationship between migration and fertility in developing countries, such as Brazil, did not receive much attention, despite being an interaction that can bring changes to both demographic components, affecting population dynamics in Brazil. Despite being a 1986 statement, it still holds today. Therefore, such a study is justified by the gaps that this theme still presents, and by the different results found in the studies already done.

The preliminary results found in this study showed a reduction in the fertility differentials of migrants between household situations. Rural / rural migrants have remained with the highest CFRs over the years. The CFRs of the rural-urban migrant group and the total fertility rate, among women aged 40 to 49, were very close. When disaggregating by regional levels, fertility differentials were also observed, however, different between regions.

Based on the literature on rural-urban fertility differentials, we believe that, when analyzing reproductive behavior, based on migratory status, we can better understand the fertility transition process. For this reason, this work intends to deepen these analyzes in search of a better understanding between migratory groups and their fertility differentials.

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