PRÁTICAS EDUCATIVAS, MEMÓRIAS E ORALIDADES

Rev. Pemo – Revista do PEMO

Intermunicipal migration in the Southern Ceará Mesoregion in the periods 1995-2000 and 2005-2010

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Summay
Este estudo teve como objetivo mesurar o fluxo de migração populacional intermunicipal nos municípios da mesorregião Sul do Ceará nos períodos 1995-2000 e 2005-2010, identificar os determinantes e testar a hipótese de seletividade. Foi feito uso dos microdados dos Censos Demográficos de 2000 e 2010 considerando o conceito de migrante por data fixa, ou seja, onde o indivíduo residia cinco anos antes da aplicação do Censo. An extended Mincerian equation was estimated with sample bias correction to test the migrant selectivity hypothesis. Finally, a logit model was estimated, also with bias correction, to identify the determinants in the decision to migrate. It was identified that the three most populous municipalities in the Southern Region of Ceará showed positive net balances in both periods. The selectivity hypothesis was accepted indicating, as in the literature, that the migrant is a positively selected individual. On average, the migrant has a wage differential around 10% due to unobservable characteristics. The results suggest that any policies to avoid human capital flight in the less populous municipalities of the region should focus on creating more opportunities for young people with higher education.
Keywords: Migration. Selection bias. Profile of the migrant. Migrant selectivity. Determinants of migration.

Migração intermunicipal na Mesorregião do Sul do Ceará nos períodos 1995-2000 e 2005-2010

Abstract
Este estudo visava medir o fluxo migratório populacional entre os municípios da região sul do Ceará no período 1995-2000 e 2005-2010, identificar os determinantes e testar a hipótese de selectividade. Os microdados dos Censos Demográficos de 2000 e 2010 foram utilizados considerando o conceito de migrante por data fixa, ou seja, onde o indivíduo residia cinco anos antes da aplicação do Censo. Uma equação minceriana alargada foi estimada com a correcção do enviesamento da amostra para testar a hipótese da selectividade do migrante. Finalmente, foi também estimado um modelo logit com a correcção do enviesamento para identificar os factores determinantes na decisão de migração.

DOI: https://doi.org/10.47149/pemo.v3i3.7174
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

Foi identificado que os três municípios mais populosos da Região Sul do Ceará tinham saldos líquidos positivos em ambos os períodos. A hipótese de selectividade foi aceite indicando, tal como na literatura, que o migrante é um indivíduo seleccionado positivamente. Em média, o migrante tem um diferencial salarial de cerca de 10%, devido às características não observáveis. Os resultados sugerem que quaisquer políticas para evitar a fuga de capital humano nos municípios menos populosos da região deveriam concentrar-se na criação de mais oportunidades para os jovens mais instruídos.
Palavras-chave: Migração. Viés de selecção. Perfil do migrante. Selectividade do migrante. Determinantes da migração..

1 Introduction

Population displacement has always been present in Brazil and in other countries. With technological advances, it was possible to study migration using a diversity of databases from government agencies. Justo and Silveira Neto (2012), emphasize the importance of the analysis of these data, which enabled a better understanding of the migration process, as well as allowing researchers to identify the personal and locational characteristics of migrants and non-migrants.

In this context, it is possible to identify the migrants and their characteristics, thus allowing a profile of them to be drawn. Moreover, it is also possible to characterize the areas that most receive these migratory flows. Justo and Silveira Neto (2009), state that the scientific study on migration is still relatively recent and that population displacement is a common aspect of human beings.

Migration can cause several problems that present themselves mainly in the overpopulation of large urban centers, which causes poor distribution of people, leading them to be allocated to areas at risk of landslides, safety, and contamination due to lack of sanitation in these areas. In addition, overpopulation can lead to unemployment for a large part of these people, since cities are not able to provide jobs for everyone. Overcrowding can also lead to delays in getting around on public roads, either because of the large number of vehicles in traffic, or because of overcrowding in public transport. Another area that can also be harmed by migration is health care, since there will be an increase in

DOI: https://doi.org/10.47149/pemo.v3i3.7174
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

demand for these services. These events occur due to the lack of urban planning, since not all municipalities have sufficient financial resources to increase the supply of infrastructure, and there is often a lack of human capital in public administration with the capacity to make the necessary urban planning.

The choice of this research is related to the importance of understanding and analyzing the behavior of a given society over time and space, as well as to the great relevance of understanding the level of development of a region. Furthermore, as stated by the neoclassicists, the regions that have greater scarcity of labor, consequently the rate of remuneration is higher. Thus, it generates a great incentive for migratory movements to these locations (JUSTO; SILVEIRA NETO, 2006).

The objective of the article is to measure the flow of inter-municipal population migration in the municipalities of the southern mesoregion of Ceará in the periods 1995-2000 and 2005-2010 based on microdata from Demographic Censuses, identify the determinants and test the hypothesis of migrant selectivity.

The article advances in the literature by making use of the correction of sample selection bias and focusing on regional migration with the application of a model that captures the determinants of migration to a region where the distances between the places of migration are smaller.

The paper is divided into five sections in addition to this introduction. The second section presents the theoretical framework. Next, a brief literature review is presented. The fourth section presents the methodology. In the fifth section, the results are discussed and, in the last section, the final considerations are presented..

2 Theoretical reference

Describe how the study was developed in order to allow its replication. It may contain information regarding: the research approach, the type of study, the place where it

Rev. Pemo, Fortaleza, v. 3, n. 3, e337174, 2021
DOI: https://doi.org/10.47149/pemo.v3i3.7174
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

was developed, the subjects who collaborated, the data collection instrument, the data analysis technique and the ethical aspects.

According to Justo and Silveira Neto (2009), although there are theoretical models capable of formalizing internal migration between regions, there are many articles in the area that deal only with describing the phenomenon. This may be related to the fact that it is easier to describe migration than to measure it, since it requires more effort both to understand the method to be used and its application. In his work formulated in 2008, the author approaches five models: Harris and Todaro (1970); Chiswick (1999); Borjas (1987); Katz and Stark (1987) and Heitmuller (2003), in which the author divides the works into two categories. The first is composed of models that seek to explain migration movements from an economic point of view, in which the characteristics of the place of origin or destination of migration are analyzed, and the motivation is explained by income differentials between localities. In the second category, the models try to explain migration in a more individual-centered way, considering observable or unobservable personal characteristics that affect the decision to migrate.

In this context, this paper does not intend to cover all the models addressed by Justo and Silveira Neto (2009), but this brief synthesis serves to list two different ways of analyzing migration that these models refer us to.

2.1 Theoretical Model of Migration

The phenomenon of migration is based on the Theory of Human Capital, which, according to Justo and Silveira Neto (2009), is based on the principle of utility maximization of individuals and that hardly a theoretical model could grasp all the specificities involved in the migration phenomenon. That is, besides the traditional neoclassical argument of the migrant's intertemporal utility maximizing behavior, other arguments have been considered in the decision to migrate by individuals, such as the personal characteristics of the individual, locational attributes and amenities, in addition to the factors mentioned above.

Among the main models of migration theory exposed by Justo and Silveira Neto (2009), in the perspective of gathering the main models of support for the migration

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ISSN: 2675-519X

phenomenon, such models are classified by the author as to the variables sought to explain the decision to migrate, being two strands of models. The first contemplates the models that try to explain migration by characteristics of the place of origin or destination, whose motivation for migration is explained by the difference in income of the localities. The second category for explaining the decision to migrate lies in the interaction of observable and unobservable personal characteristics.

In their work, Justo and Silveira Neto (2009) present five theoretical models that seek to formalize migration. According to the authors, the model of Harris-Torado (1970) is more appropriate to treat migration with aggregate data and that has as one of the economic and intuitive appeals to migration by the income differential between regions, weighted by the property of finding employment in the destination place. Similarly, Justo and Silveira Neto (2009) state that the other models exposed by them, are better suited to treat migration from microdata. In this context, the model to be adopted in this work is inspired by the models used to work with microdata. Next, the Borjas Model (1987) is presented.

This model analyzes how the income of the immigrant population may differ from the income of the native population due to the endogeneity of the decision to migrate (JUSTO; SILVEIRA NETO; 2009).

The model assumes the existence of two locations: origin 0 and destination 1, whose incomes are distributed as follows:

$$1_n W_0 = \mu_0 + \varepsilon_0 \quad (1)$$

$$1_n W_1 = \mu_1 + \varepsilon_1 \quad (2)$$

Where, ε_1~N(0,σ_1^2) and $\varepsilon 0$ and $\varepsilon 1$, have correlation coefficients ρ.

The migration decision of people from country "0" is determined by the following function:

$$\mathrm{I} = \mathrm{Ln}[W_1/(W_0 - C)] \approx \mu_1 - \mu_0 - \pi + (\varepsilon_1 - \varepsilon_0) \quad (3)$$

Where C is the mobility costs and π=C/W_0 .

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ISSN: 2675-519X

It is then assumed that π is a constant across all individuals in the place of origin. Thus, there will be migration when I > 0 and the emigration rate from the place of origin is given by:

$$P = P_r[U > -(\mu_1 - \mu_0 - \pi)] = 1 - \Phi(z) \quad (4)$$

Where, U=ε_1-ε_0 , z=(μ_1-μ_0-π)/σ_v and Φ is the distribution function of a standard norm.

Equation (4), according to Justo and Silveira Neto (2009), states that the probability of migrating will be higher as the return differential between the destination and origin (μ1-μ0) increases and will be lower as the migration costs (π) increase.

Having the knowledge of the above, we can verify what is the income expectation of the worker in country 1 and 0, that is, when I > 0 the decision will be to migrate, it is an income conditioned to the decision to migrate or not to migrate. Thus, the logarithm of income is given by:

$$E(\ln W\_0/I > 0) = E(\mu\_0 + \varepsilon\_0/I > 0) = \mu\_0 + E(\varepsilon\_0/I) > 0 = \mu\_a + E\ (\varepsilon\_0\ \varepsilon\_0)/\sigma\_0\ /U/\sigma\_U > z = \mu\_0 + \sigma\_0\ E(\varepsilon\_0\hat{}\ */U\hat{}\ *> z)\ (5)$$

Where $\varepsilon\_0\hat{}\ *= \varepsilon\_0/\sigma\_0$ and $U\hat{}\ * = U /\sigma\_U$. Presented that the conditional hope is linear, it can be rewritten as $\varepsilon\_0\hat{}\ * = \rho\_0U\ U\hat{}\ * + \xi$. The correlation between $\varepsilon\_0\hat{}\ *$ and $U\hat{}\ *$ is ρ_0U. Which implies:

$$E((\ln W\_0)/I > 0) = \mu\_0 + \sigma\_0\ E(\varepsilon\_0\hat{}\ */U\hat{}\ *> z) = \mu\_0 + \sigma\_0\ E(\rho\_0U\ U\hat{}\ * + \xi/U\hat{}\ *> z = \mu\_0 + \sigma\_0\ \rho\_0U\ E(U\hat{}\ */U\hat{}\ *> Z)\ (6)$$

Thus:

$$\rho\_0U = (COV(\varepsilon\_0, U))/(\sigma\_0\ \sigma\_U) = (E[\ [\![(\varepsilon]\!]\ \_0 - E(\varepsilon\_0))(U - E(U)(U))/(\sigma\_0\ \sigma\_U) = (E(\varepsilon\_0\ U))/(\sigma\_0\ \sigma\_U)$$

As:

$$E(\varepsilon\_0\ \varepsilon\_1\ ) = COV(\varepsilon\_0\ \varepsilon\_1\ ) = corr(\varepsilon\_0\ \varepsilon\_1\ )\ \sigma\_0\ \sigma\_1 = \rho\sigma\_0\ \sigma\_1\ (7)$$

Thus we have:

$$\rho\ \_0U = (\rho\sigma\_0\ \sigma\_1 - \sigma\_0\hat{}2)/(\sigma\_0\ \sigma\_1\ )\ (8)$$

Therefore:

$$E((\ln W\_0)/I > 0) = \mu\_0 + \sigma\_0\ (\rho\sigma\_0\ \sigma\_1-)/\sigma\_U\ (\sigma\_0\hat{}2)/\sigma\_0\ \lambda$$

$$= \mu\_0 + (\sigma\_0\ \sigma\_1\hat{}2)/\sigma\_U\ \rho - \sigma\_0/\sigma\_1\ \lambda\ (9)$$

Where $\lambda = E(U\hat{}\ */U\hat{}\ *> z)$

Therefore, λ is inversely related to the emigration rate and will be positive as long as there are people wh

Similarly, one can arrive at the logarithm of the migrant's income at location "1":

$$E(\ln W\_1/I > 0) = \mu\_1 + (\mu\_0\ \mu\_1\hat{}2)/\sigma\_U\ \sigma\_1/\sigma\_0\ - \rho\lambda\ (10)$$

Having obtained the expected income in countries 1 and 0, one can then obtain the average income. In thi

$$Q\_0 = E(\ln w\_0/I > 0) - \mu\_0\ (\sigma\_0\ \sigma\_1\hat{}2)/\sigma\_U\ \rho - \sigma\_0/\sigma\_1\ \lambda\ (11)$$

Starting from equations (11) and (12), we see three possibilities interpreted by Justo and Silveira Neto (2

> 0 and Q $Q\_1 = E((\ln w\_1)/I > 0) - \mu\_1\ (\sigma\_0\ \sigma\_1\hat{}2)/\sigma\_U\ \sigma\_0/\sigma\_1\ - \rho\lambda\ (12)$

$< 0\ \rho <\ \sigma\_0/$

σ_1 , in which migrants are positively selected if the qualification in the two places is high enough, for tha

0 e Q $< 0\ \rho >\ \sigma\_0/$

σ_1 , where migrants are negatively selected, as the correlation between the qualification between the tw

0 e Q $< 0\ \rho <\ \sigma\_0/$

σ_1 , in this condition, migrants are said to be "refugees", as they have below average incomes in the place

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2. 2 Literature review

Santos and Silveira (2003), state that the main cause of urbanization in Brazil is population displacement in the different regions of Brazil. In the 1940s, the Brazilian rural population totaled 68.7%, and this reduced to 15.65% in 2010, according to the IBGE. We can take as hypotheses for such an event, economic (such as the fact of industrialization in Brazil, which ended up expanding the labor market), social, political and climatic reasons.

Rev. Pemo, Fortaleza, v. 3, n. 3, e337174, 2021
DOI: https://doi.org/10.47149/pemo.v3i3.7174
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

To reinforce the above argument, according to Baeninger (2000), the scenario of spatial mobility of the population in Brazil in the 1980s and 1990s highlights the complexity and diversification of population displacement provided by the effects of the urbanization process, in which these displacements have redefined important aspects of the process of spatial distribution of the Brazilian population.

Still on this perspective of population distribution, Justo (2015) points out that from the 1950s, with the regional imbalances and the improvement in the transport system, there was a significant increase in the number of migrants, both state and inter-municipal, since it became much easier to move in search of better living conditions.

According to Santos (1997), in our surroundings there is always someone who is not a native of that place, that is, those who are outside their place of birth are considered migrants. In this perspective exposed by the author, many people become migrants unconsciously, because some municipalities, poorly developed structurally, do not offer infrastructure or qualified professional support for births, which forces many families to move to another municipality in search of a suitable birth.

As Singer (1976) states, migrant populations, almost in their entirety, originate from regions undergoing economic or social stagnation (structural problems). Thus, a large part of the population goes through these difficulties, which ends up triggering migrations from a region in stagnation, be it economic, political, housing, or other privations, towards more dynamic areas. Reinforcing such argumentation, Martine and Camargo (1984) point out that the displacement of people within or outside the same region means a reordering of economic and social opportunities.

Following a similar line of reasoning, Justo and Silveira Neto (2008) state that migration flows can be explained by economic theory, which refers to the human capital theory, indicating that the decision to migrate is related to the fact that the individual makes a comparison of the income in the current place of residence and the possible income in the new place of residence. Still about the authors, they state that the migration process is important for the understanding of the impacts caused by this phenomenon, since it is related to the economic and social conditions of each region.

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ISSN: 2675-519X

The economic policies implemented in some regions can influence the displacement of the population from one region to another, and can also generate a poor distribution of income among the individuals who live there. Factors such as unequal spatial concentration and the deepening of distributional inequalities between regions are possibly consequences of regional policies or lack thereof (JUSTO; SILVEIRA NETO, 2006).

Still in this line of argument, Martine and Camargo (1984), ensure that the redistribution of the population happens due to the reordering of capital, that is, economic activities tend to be located in areas less costly for production, and this ends up generating many job opportunities for many people located in less economically dynamic regions.

In this way, the reorganization of people in other regions has predominantly socioeconomic motives. According to Ravenstein (1980), economic causes are the fundamental ones for the decision to leave or to stay. He also takes as hypothesis the way individuals characterize urban and rural areas, in which the urban environment becomes the modern one, even if the individual does not have a reasonable economic life, while the rural space is seen as an old way of life, even if one has a stable life economically.

Throughout the 1970s and 1980s, Baeninger (2000, p. 3) states that "internal migrations reorganized the population in the national territory, where the strands of industrialization and agricultural frontiers constituted the axes of the dynamics of spatial distribution of the population at the interstate level". Still according to Baeninger (2000), although the displacement of economic activities and the displacement of population go together, this is a picture that has been undergoing changes over the decades and that began in the 1970s, but only in the period 1981-2000 did this process become more evident.

As highlighted earlier by Justo and Silveira Neto (2009), about the study on migration being recent, the article by Ravestien (1880 apud JUSTO, 2008, p. 2) "provided the first example of what can be called a scientific study of internal migration. According to Greenwood and Hunt (2003 apud JUSTO, 2008, p. 2) "The limitation of data was certainly a discouraging fact for the study of this subject". However, with technological advances

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ISSN: 2675-519X

and the computerization of data, studies on this theme have gained great support, going from merely descriptive studies to quantitative and qualitative studies.

According to Greenwood and Hunt (2003 apud JUSTO, 2008, p. 2), "the studies on the theme migration only started to have a more formal aspect after the 1960s.

3 Methodology

3.1 Characterization of the study área

The Mesoregion Sul Cearense is one of the 7 mesoregions of Ceará, occupying an area equivalent to 14,892.13 km², corresponding to 10% of the state territory and housing a demographic continent of 876,600 inhabitants that corresponds to 10.37% of the state population, IBGE (2010).

The Mesoregion Sul Cearense is inscribed in the southern portion of the State of Ceará between parallels 060 46' 07" to 070 51' 25", south latitude and 380 22' 09" to 400 35' 59" west Greenwich longitude and is composed of 25 municipalities, based on data obtained from IBGE, as can be seen in Figure 01.

Figure 01: Southern Ceará Mesoregion

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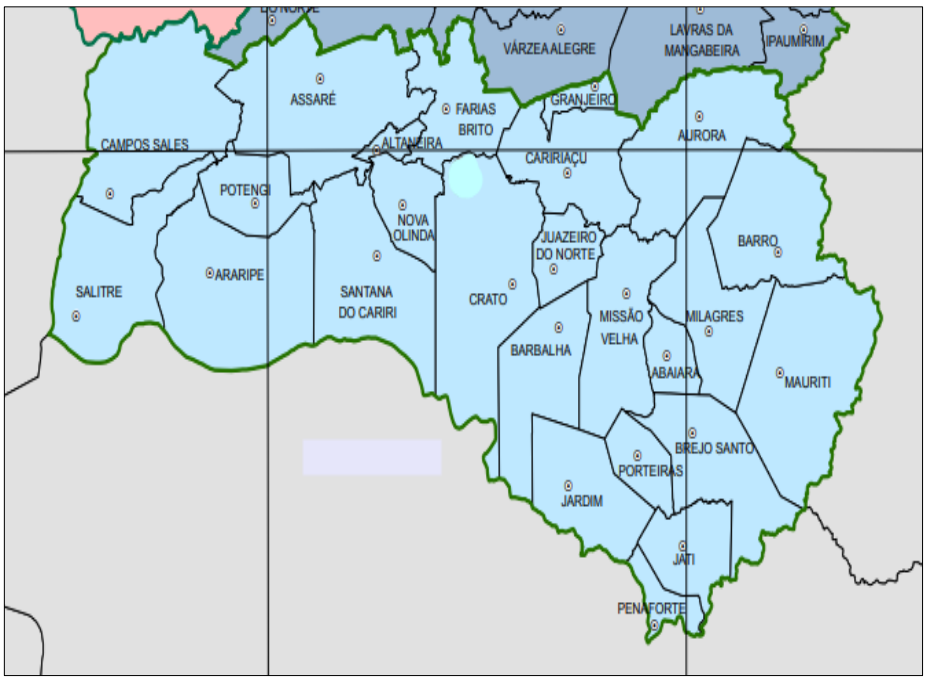
Fonte: IPECE, 2007.

According to the Meteorology and Water Resources Foundation of Ceará (FUNCEME, 2010), the climate of the municipalities that make up the Southern Ceará Mesoregion is divided into three types: tropical hot semi-arid, tropical hot mild semi-arid and tropical hot sub-humid. It is also important to highlight that the



Mesoregion Sul Cearense has the 4th largest population of Ceará, behind the Mesoregions

Rev. Pemo, Fortaleza, v. 3, n. 3, e337174, 2021
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Metropolitana de Fortaleza, Noroeste Cearense and Norte Cearense, according to the demographic census of 2010. Table 01 shows the municipalities of the Southern Ceará Mesoregion, with their respective population, area and population density.

Table 01: População, Área e Densidade Demográfica dos Municípios da Mesorregião Sul Cearense

Municips	Population 2010	Area (km²)	Densidad Demograph (hab/km²)
Abaiara	11.605	178,83	64,89
Altaneira	7.479	73,296	102,04
Araripe	21.398	1.099,93	19,45
Assaré	23.254	1.116,33	20,83
Aurora	24.496	885,836	27,65
Barbalha	59.811	569,508	105,02
Barro	22.440	711,887	31,52
Brejo Santo	48.830	663,428	73,6
Campos Sales	27.209	1.082,77	25,13
Caririaçu	26.892	623,564	43,13
Crato	130.604	1.176,47	111,03
Farias Brito	18.720	503,622	37,17
Granjeiro	4.425	100,127	44,19
Jardim	27.076	552,424	49,01
Jati	7.847	353,298	22,21
Juazeiro do Norte	270.383	248,832	1.086,61
Mauriti	46.548	1.049,49	44,35
Milagres	28.231	606,444	46,55
Missão Velha	35.409	645,703	54,84
Nova Olinda	15.433	284,401	54,26
Penaforte	8.956	149,715	59,82
Porteiras	14.921	217,58	68,58
Potengi	10.918	338,727	32,23
Salitre	16.331	804,356	20,3
Santana do Cariri	17.489	855,563	20,44
Mesorregião Sul Cearense	806.341	14.892,13	54,14

Fonte: IBGE, 2017.

In relation to demographic density, the Southern Ceará Mesoregion presented an index of 58.86 inhabitants per km², highlighting the municipality of Juazeiro do Norte, which

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reached 1,004.45 inhabitants per km², while the municipality of Araripe reached only 18.81 hab/km².

3. 2 Nature and source of data

The source of the information is secondary data obtained from the Brazilian Institute of Geography and Statistics - IBGE, making use of microdata from the 2000 and 2010 censuses. Given the tools used in the research, it can be concluded that it is treated as a quantitative research.

3.3 Migration Matrix

Complementing the econometric model developed with the functionality of capturing the characteristics of the migrant individual, the migration and returnee matrix follows Justo et al. (2010), which in turn is the instrument for measuring migration flows.

$$A = \begin{bmatrix} \alpha_{11} & \cdots & \alpha_{1j} \\ \vdots & \ddots & \vdots \\ \alpha_{j1} & \cdots & \alpha_{jj} \end{bmatrix}$$

a_{ij}= saída do migrante do município i para o município j da Mesorregião Sul Cearense

$\sum_{i=1}^{25} \alpha_{1j}$ = total de pessoas que emigram (saída) do município 1

$\sum_{i=1}^{25} \alpha_{1j}$ = total de pessoas que imigram (entrada) para o município 1

$$a_{11}=a_{22}= a_{33}=\cdots= a_{jj}=0$$

In turn, the matrix brings the support of the measurement of migration flows, and can from then on identify which municipalities expelled or attracted migrants. In other words, through the entries and exits, the Net Migration Rate - NMR - can be calculated. Migration is considered to be the displacement of individuals within a geographic space, temporarily or permanently. The concept of migration adopted here is that presented by Santos (1997), in which individuals who are outside their place of birth will be considered migrants.

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3.4 Migrant Selectivity

To meet the objective of testing the selectivity hypothesis of the inter-municipal Migrant in the Cariri region, the estimation of an extended Mincerian equation was used. The basic Mincer (1974) equation is given by equation (1):

$$\ln w_i = \beta_1 + \beta_2 educ_i + \beta_3 exp_i + \beta_4 exp_i^2 + u_i \quad (1)$$

Where, lnwi = logarithm of the hourly wage of individual "i", educ = years of study, exp = experience and = squared experience and = error vector.

In the extended form we have:

$$\ln w_i = \beta_1 + \beta_2 educ_i + \beta_3 exp_i + \beta_4 exp_i^2 + \beta_5 x_i + u_i \quad (2)$$

Where x is a vector of observable characteristics of the individual, such as gender, race as described in the description of variables.

Thus, we have the log-lin functional form, that is, the dependent variable in logarithm and the explanatory variables in level. Thus, considering, for example, the dependent variable schooling, it measures how much an extra year of schooling causes a proportional variation in the individual's salary. Put another way, the coefficient captures the premium of the attribute. In this study, the focus is on the migrant dummy, because this way, we have the migrant wage differential in relation to the non-migrant.

By using this functional form, the variance of the residuals is less likely to have heteroscedasticity problems and the distribution of the residuals is closer to the normal distribution, which validates the hypothesis tests that use the "t" and "F" distributions.

According to Menezes Filho (2002), the coefficients of the Mincerian regression estimated only with and a specific variable, apprehends the relative or uncontrolled gross premium in terms of the variation of the salary. On the other hand, a multivariate Mcerian equation in this same functional form captures the relative gross marginal premium controlled in terms of wage variation. That is, it allows isolating the effect of this variable from possible correlations with the other variables included in the estimation.

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ISSN: 2675-519X

Menezes Filho (2002), also points out some problems in estimating the Mincerian equation. One of them is the unobservable non-ability bias that positively affects both wages and education. That is, one has that part of the estimated return to schooling is due to a higher skill of the individual which, in turn, increases the wage. Thus, you have an overestimation of the return to schooling. However, there may be measurement errors due to people not accurately describing their schooling. It is possible that people "round up" the information on years of schooling, which would decrease the return to schooling. In this sense, in this study, it was assumed the hypothesis that the final vector resulting from these two forces is zero, that is, one phenomenon compensates the other, considering that the focus is on the coefficient of the migration dummy.

However, in the Minerian equation of wages with the migration dummy, it is possible the presence of another bias. It is the selectivity bias referring to the probability of the individual "i" being a migrant. In the molds of the bias pointed out by Heckman (1979), it consists in the hypothesis that the individual decides not to migrate if the possible gains from migration are not worth making such a decision, that is, there is a reserve income that discourages migration if the income differential obtained at the destination is lower than this limit. Given the controls in the Mincerian equation proposed to the model, it is worth saying that if the migrant presents selectivity, it is a reflection of unobservable characteristics in relation to the non-migrant.

To correct for this problem, the Heckman (1979) procedure was adopted. This procedure has two steps. In the first, a probit model is estimated to determine the probability that the individual is an intercity migrant. After that, the inverse Mills ratio (λ) is added as a regressor in the MQO estimation of equation (2).

3.5 Determinantes da Migração Intermunicipal

To meet the objective of identifying the determinants of inter-municipal migration in Cariri, a logit model given by equation (3) was estimated:

$$Y_i^* = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + ... + \beta_k X_{ki} + \varepsilon_i \quad (3)$$

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which assumes that the variable Y, with Y = 1 or Y = 0, is just the observable manifestation of an unobservable variable Y* (called latent variable), in this case, 1 if it is intercity migrant and 0 if non-migrant, where a rule for determining Y as a function of Y* is specified.

In general, this rule is given as follows:

$$Y_i = \begin{cases} 1 \text{ se } Y_i^* \geq 1 \\ 0 \text{ se } Y_i^* < 0 \end{cases} \quad (4)$$

According to Greene (2012), for models characterized by equations (3) and (4), one has:

$$\text{Prob}(Y_i=1) = \text{Prob}(Y_i^*>0)=\text{Prob}(\beta_1+\beta_2 X_{2i}+\beta_3 X_{3i}+...+\beta_k X_{ki}+\varepsilon_i>0)=$$
$$\text{Prob}(\varepsilon_i>-X_i\beta)$$

e no outro caso:

$$\text{Prob}(Y_i=0)=\text{Prob}(\varepsilon_i<-X_i\beta)$$

Considerando ε_i uma variável aleatória com função de distribuição F(.), tem-se:

$$\text{Prob}(Y_i=0) = F(-X_i\beta),$$
$$\text{Prob}(Y_i=1) = 1-F(-X_i\beta). \quad (5)$$

The two most commonly used choices for the functional form correspond to the logistic and probit distributions, the latter being assumed to have a reduced normal distribution and F(.) denoting the normal distribution function.

Como nesse estudo optou-se pelo modelo *logit*, F(.) fica da seguinte forma:

$$\wedge(x) = \frac{1}{1+e^{-x}} \quad (6)$$

However, the coefficients in the vector in the logit model do not have the usual interpretation in multiple linear regression models, since:

$E(Y_i) = 0[1-F(X_i\beta)] + 1F(X_i\beta)$.

Isto é,

$E(Y_i) = F(X_i\beta)$, (7)

Assim, tem-se:

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$$\frac{\partial E(Y_i)}{\partial X_i} = \frac{dF(X_i\beta)}{d(X_i\beta)} \frac{\partial (X_i\beta)}{\partial X_i} = f(X_i\beta)\beta$$

Assim, de (7) observa-se que no modelo *logit* β_j não mensura necessariamente o efeito marginal de X_j sobre E(Y). Nos modelos lineares tem-se:

$$\frac{\partial E(Y_i^*)}{\partial X_{ji}} = \beta_j$$

To choose the variables for the estimation of equation (3) with the logistic distribution, Justo and Silveira Neto (2006) and the restriction of variables available in the microdata of the two selected Censuses were followed, and the variables listed in Table 01 were selected.

Table 01 shows the detailed description of the variables, as well as the values assumed by the dummies for each attribute.

Trable 01: Description of the variables used in the econometric models

VARITY	DESCRICTION
Lrendhora	Logarithm of the real hourly wage
Idade	In years
Idade2	Age squared
Aestud	Years of schooling
Dfilho	Binary variable: 1 has children; 0 has no children
Dmsc	MSC migrant
Dprevid	Binary variable: 1 migrant; 0 non-migrant
Ddestadocivil	Social security contribution
Draça	Binary variable: 1 contributes; 0 does not contribute
Dsexo	Marital Status
Dsdom	Binary variable: 1 single; 0 not single
Dcocup	Race
AestudXdsexo	Binary variable: 1 white; 0 not white
DestadocivilXdsexo	Sex
DracaXdsexo	Binary variable: 1 male; 0 female
Mymills	Household status

Fonte: Elaboração própria com base em Cavalcante e Justo (2017).

4 Results and discussions

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In this section, the results of the net migration balance for the municipalities of the Southern Ceará Mesoregion in 2000 and 2010 will be presented initially. Then, the personal characteristics of the migrant and the non-migrant will be presented, as well as the characteristics of the labor market. Also, in the next topic, the estimates of the two econometric models will be presented.

The net migration balance (entry minus exit) of people in the twenty-five municipalities of the Southern Ceará Mesoregion, for the period 1995-2000, is presented in Table 02..

TabLE 02: Intermunicipal Migration in the Southern Ceará Mesoregion in 2000

MUNICIPALITIES	ENTRY	EXIT	BALANCE	NET BALANCE
Abaiara	560	236	324	3,86%
Altaneira	307	266	41	0,72%
Araripe	255	282	-27	-0,14%
Assaré	345	812	-467	-2,24%
Aurora	163	1381	-1218	-4,83%
Barbalha	1687	955	732	1,56%
Barro	397	376	21	0,11%
Brejo Santo	1107	788	319	0,83%
Campos Sales	491	372	119	0,47%
Caririaçu	1006	1133	-127	-0,49%
Crato	2976	2498	478	0,46%
Farias Brito	431	757	-326	-1,61%
Granjeiro	140	133	7	0,13%
Jardim	117	458	-341	-1,27%
Jati	122	274	-152	-2,09%
Juazeiro do Norte	5870	3004	2866	1,35%
Mauriti	456	556	-100	-0,24%
Milagres	375	952	-577	-2,14%
Missão Velha	546	1377	-831	-2,55%
Nova Olinda	576	607	-31	-0,26%
Penaforte	102	88	14	0,20%
Porteiras	353	404	-51	-0,33%
Potengi	391	286	105	1,13%

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Salitre	164	287	-123	-0,88%
Santana do Cariri	292	947	-655	-3,89%

Fonte: Elaboração própria com base nos microdados do Censo Demográfico de 2000.

As can be seen, the municipalities of Abaiara, Barbalha and Juazeiro do Norte, presented the highest net balance of migration, respectively. The municipalities of Aurora, Santana do Cariri and Missão Velha, presented the lowest net migration balance, respectively.

Table 03 shows the net migration balance for the period 2005-2010. Unlike the previous period, the municipalities that presented the highest balances were, Nova Olinda, Altaneira and Barbalha, especially the latter, which remained among the top three in both 2000 and 2010..

Table 03: Intermunicipal Migration in the Southern Ceará Mesoregion in 2010

MUNICÍPIOS	ENTRADA	SAÍDA	SALDO	SALDO LÍQUIDO
Abaiara	296	153	143	1,36%
Altaneira	463	231	232	3,38%
Araripe	380	627	-247	-1,19%
Assaré	465	549	-84	-0,34%
Aurora	468	803	-335	-1,36%
Barbalha	1806	924	882	1,59%
Barro	328	429	-101	-0,47%
Brejo Santo	1014	839	175	0,39%
Campos Sales	257	585	-328	-1,24%
Caririaçu	563	703	-140	-0,53%
Crato	2707	2113	594	0,49%
Farias Brito	326	1081	-755	-3,97%
Granjeiro	135	130	5	0,10%
Jardim	118	687	-569	-2,13%
Jati	117	191	-74	-0,97%
Juazeiro do Norte	5402	4001	1401	0,56%
Mauriti	340	461	-121	-0,27%
Milagres	563	1063	-500	-1,77%
Missão Velha	656	1178	-522	-1,52%
Nova Olinda	855	361	494	3,47%

DOI: https://doi.org/10.47149/pemo.v3i3.7174
https://revistas.uece.br/index.php/revpemo
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Penaforte	49	64	-15	-0,18%
Porteiras	250	257	-7	-0,05%
Potengi	285	243	42	0,41%
Salitre	197	47	150	0,97%
Santana do Cariri	251	571	-320	-1,86%

Fonte: Elaboração própria com base nos microdados do Censo Demográfico de 2010.

Table 04 shows the estimation of equation 2 with the Heckman correction for the year 2000. Except for the constant and the coefficient of the dummy for children, all the others are significant at 1%. In general, the results are in agreement with the literature regarding the partial effects of each explanatory variable on the dependent variable. In other words, the signs of the coefficients are in accordance with what was expected, corroborating works such as Justo and Silveira Neto (2006). The higher the age, the higher the log hourly wage, but the decreasing marginal effect is observed, since the sign of the squared coefficient of this variable is negative. There is also a positive effect of education on the log hourly wage. With regard to the dummies, we observe that there is a negative differential in the log hourly wage of single workers compared to other categories, as well as for those who contribute to social security and those who work in agriculture compared to other sectors. However, there is a positive differential for whites in relation to the other categories, for men and for those who live in urban areas. The coefficient of the inverse of the Mills ratio was significant and negative indicating the presence of a bias.

One of the differences between this study and most other studies that estimate the extended Mincer equation to capture the differential in relation to the migrant is the interaction dummies. Thus, we have that the return to schooling decreases between men and women, when it increases. That is, the higher the level of schooling, the smaller the difference in the return favorable to men. For single men, on the other hand, there is a positive differential. Remember that, in isolation, that is, analyzing only marital status, single men receive less. However, there is no additional effect on the salary for white men.

An important result that also corroborates with the literature, is the positive migrant wage differential. The sign of the coefficient of the migration dummy is positive, even after correction for selection bias. This result is important because the geographic unit of analysis is the municipality, and the distance between municipalities is relatively small when compared to other studies that have a larger geographic unit or consider a study area in which the distance between the analyzed units is greater. Still, the migrant receives on average 11.37% more than the non-migrant.

Test F is significant at 1%, indicating that the hypothesis that the coefficients of the explanatory variables are simultaneously equal to zero is rejected. The degree of fit of the model is satisfactory and compatible with results for this type of estimation. In this case, it was 33.48%.

Tabela 04: Equação Minceriana ampliada para 2000

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ISSN: 2675-519X

Lrendhora[1]	Coeficiente	Std. Err.*	t	P>t	[95% Conf.	Interval]
Idade	0,0372	0,0007	53,23	0,0000	0,0359	0,0386
Idade2	-0,0002	0,0000	-20,23	0,0000	-0,0003	-0,0001
Aestud	0,0779	0,0009	88,22	0,0000	0,0762	0,0796
Dfilho	-0,0027	0,0076	-0,36	0,7190	-0,0177	0,0122
Dmsc	0,1077	0,0059	-18,22	0,0000	-0,1192	-0,0961
Dprevid	-0,0262	0,0142	-1,85	0,0650	-0,0541	0,0016
Destadocivil	-0,1247	0,0074	-16,81	0,0000	-0,1392	-0,1101
Draça	0,2059	0,0063	32,74	0,0000	0,1936	0,2183
Dsexo	0,3969	0,0085	46,87	0,0000	0,3803	0,4135
Dsdom	0,3081	0,0052	59,23	0,0000	0,2979	0,3183
Dcocup	-0,9497	0,0119	-79,75	0,0000	-0,9731	-0,9264
AestudXdsexo	-0,0251	0,0010	-24,10	0,0000	-0,0271	-0,0230
DestadocivilXdsexo	0,0372	0,0007	53,23	0,0000	0,0359	0,0386
DracaXdsexo	-0,0281	0,0000	-20,23	0,0000	-0,0353	-0,0002
Mymills	0,0779	0,0009	88,22	0,0000	0,0762	0,0796
Constante	-0,0027	0,0076	-0,36	0,7190	-0,0177	0,0122
F(15, 254542) = 6445,74						
Prob > F = 0,0000						
R-squared = 0,3348						

Fonte: Elaboração própria com base nos microdados do Censo Demográfico de 2000.
Nota: * Desvio padrão robusto.

Table 05 shows the estimation of the logit model of equation 3 for the year 2000, presented in the form of odds ratios. Except for the coefficient of the years of schooling variable, which is not significant, and the variable that corrects for the selectivity bias, which is significant at 5%, all the others are significant at 1%.

An additional unit of the log wage/hour above the average decreases the chance that the individual will migrate by 11.87%. An additional year in age decreases the chance of migration by 0.24%. The effect of schooling on the migration decision cannot be stated. Individuals who contribute to social security, have 47.90% more chance to migrate. Singles have 24.56% less chance of migrating. White people are 5.84% less likely to migrate. Men are 17.58% more likely to migrate. People who live in urban areas are 28.04% less likely to migrate. This result is important because it shows that in 2000, there was still rural-urban migration among the municipalities of the Cariri Messorregion. On the other hand, those who work in agriculture and cattle-raising have a 7.32% lower chance of being migrants. Thus, these two results indicate that the rural-urban migration that existed was more likely

[1] Os salários foram corrigidos pelo IPCA–E para valores de 2017.

for those who lived in the rural area, but were not working in agriculture and cattle ranching. Finally, having children decreases in 22.85% the chance of the individual migrating.

Table 05: Determinants of Intermunicipal Migration in the Southern Ceará Mesoregion in 2000

Dmsc	Odds Ratio	Std. Err.	z	P>z	[95% Conf. Interval]	
Lrendhora	0,8813	0,0064	17,35	0,0000	0,8688	0,8939
Idade	0,9976	0,0006	-3,98	0,0000	0,9964	0,9988
Aestud	1,0011	0,0015	0,75	0,4520	0,9982	1,0040
Dprevid	1,4790	0,1217	4,76	0,0000	1,2587	1,7379
Destadocivil	0,7544	0,0125	-17,03	0,0000	0,7303	0,7792
Draça	0,9416	0,0131	-4,32	0,0000	0,9163	0,9676
Dsexo	1,1758	0,0203	9,36	0,0000	1,1366	1,2163
Dsdom	0,7196	0,0132	-17,98	0,0000	0,6943	0,7459
Docup	0,9368	0,0203	-3,01	0,0030	0,8978	0,9775
Dfilho	0,7715	0,0189	-10,60	0,0000	0,7354	0,8094
Constante	0,2123	0,0191	-17,18	0,0000	0,1779	0,2534
Wald chi2(11) = 1968,10						
Prob > chi2 = 0,0000						
Pseudo R^2 = 0,1112						

Fonte: Elaboração própria com base nos microdados do Censo Demográfico de 2000.

The Wald Test is significant at 1%, indicating that the joint hypothesis that the effects of the explanatory variables on the probability of migration are null is rejected. The Pseudo R2 is compatible with results from other works, such as Cavalcante and Justo (2017).

Table 06 brings the estimation of equation (2) with Heckman correction for the year 2010. Except for the coefficient of the interaction dummy that captures the simultaneous effect of race and gender, which is not significant, and the coefficient of the interaction dummy between marital status and gender, which is significant at 5%, all the others are significant at 1%. Here the coefficient of the inverse of the Mills ratio was also checked for significance, also indicating selection bias.

In general, the results remained the same as in 2000. However, some important results emerge. The hourly wage differential favorable to men decreases relative to women and the differential favorable to whites also decreases.

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DOI: https://doi.org/10.47149/pemo.v3i3.7174
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ISSN: 2675-519X

Also in 2010, the positive selectivity of the migrant was observed, that is, on average, the migrant has a wage differential of 9.59% higher than the non-migrant. This result is corroborated with other works, such as Cavalcante and Justo (2017).

Tabela 06: Equação Minceriana ampliada para 2010

Lrendhora	Coeficiente	Std. Err.	t	P>t	[95% Conf.	Interval]
Idade	0,0110	0,0007	14,83	0,0000	0,0096	0,0125
Idade2	0,0002	0,0000	17,66	0,0000	0,0001	0,0002
Aestud[2]	0,3932	0,0023	167,99	0,0000	0,3886	03977
Dfilhos	0,0176	0,0069	2,56	0,0100	0,0041	0,0311
Dmsc	0,0916	0,0053	17,19	0,0000	0,1021	0,0812
Dprevid	-0,8084	0,0260	-31,10	0,0000	-0,8594	-0,7575
Destadocivil	-0,1894	0,0052	-36,59	0,0000	-0,1996	-0,1793
Draça	0,1542	0,0051	30,14	0,0000	0,1442	0,1643
Dsexo	0,0874	0,0088	9,91	0,0000	0,1047	0,0701
Dsdom	0,2787	0,0045	62,22	0,0000	0,2699	0,2875
Docupa	-0,9825	0,0156	62,97	0,0000	-1,0131	-0,9519
AestudXdsexo	-0,0488	-0,0036	-13,39	0,0000	-0,0056	-0,0417
DestadocivilXdsexo	0,0099	0,0076	1,35	0,1770	-0,0044	-0,0233
DracaXdsexo	-0,0101	0,0079	-1,28	0,2020	-0,0255	0,0054
Mymills	-1,0335	0,0239	-43,27	0,0000	-1,0803	-0,9866
Constante	3,3154	0,0313	105,96	0,0000	3,2541	3,3767
F(15, 287087) = 4336,71						
Prob > F = 0,0000						
R^2 = 0,2670						

Fonte: Elaboração própria com base nos microdados do Censo Demográfico de 2010.

A Tabela 07 traz a estimação do modelo *logit* da equação 3 para o ano de 2010, também apresentado na forma de razão de chance.

Table 07: Determinants of Intermunicipal Migration in the Southern Ceará Mesoregion in 2010

Dmsc	Odds Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
Lrendhora	0,9014	0,0056	-16,64	0,0000	0,8905	0,9125
Idade	0,9923	0,0005	-14,02	0,0000	0,9912	0,9934
Anosestudo	1,0116	0,0067	1,73	0,0840	09984	1,0249
Dfilhos	0,9348	0,0193	-3,27	0,0010	0,8978	0,9733
Docupa	0,8950	0,0410	-2,42	0,0150	0,8181	0,9791
Dprevid	0,7312	0,0555	-4,12	0,0000	0,6301	0,8486
Destadocivil	0,6335	0,0088	-32,98	0,0000	0,6165	0,6509
Draça	0,9340	0,0118	-5,42	0,0000	0,9112	0,9573

[2] Em 2010, o Censo Demográfico não disponibilizou a escolaridade em anos, mas em faixa de escolaridade. Dessa forma, essa variável difere do ano de 2000.

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DOI: https://doi.org/10.47149/pemo.v3i3.7174
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ISSN: 2675-519X

Dsexo	1,0625	0,0201	3,20	0,0010	1,0238	1,1027
Dsdom	0,9604	0,0139	-2,79	0,0050	0,9334	0,9880
Constante	0,3880	0,0338	-10,88	0,0000	0,3271	0,4601
Wald chi2(11) = 1494,78						
Prob > chi2 = 0,0000						
Pseudo R^2 = 0,10073						

Fonte: Elaboração própria com base nos microdados do Censo Demográfico de 2010.

According to Table 07, all coefficients are significant at 1%, with the exception of the coefficient of the Anosestudo variable, which is significant at 10% and the Docupa variable, which is significant at 5%. Higher education increases the chance of migration, just as men have a higher chance of migration. All other variables have a negative impact on the probability of the individual migrating. Marital status stands out, in which singles have 36.65% less chance of migrating and who contributes to social security, which has 26.82% less chance of migrating.

The result of the Wald test allows us to reject the null hypothesis that the simultaneous effect of all explanatory variables on the probability of migration is zero. The Pseudo R2 is satisfactory for this type of model and compatible with other results found in the literature.

5 Final considerations

The flow of people moving from place to place, motivated by various factors, has been remarkable in the history of mankind. Differentials in income and job opportunities have been one of the factors that have most motivated these displacements, including migration in Brazil. In the Northeast, and particularly in Ceará, this motivation has also been verified.

In this sense, this paper sought to analyze the flow of intermunicipal migration in the municipalities of the Mesoregion of Southern Ceará in the periods 1995-2000 and 2005-2010. It sought to measure the intermunicipal flow, to identify the profile of the migrant, to identify the hypothesis of selectivity and, finally, to identify the factors that explain the decision to migrate.

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ISSN: 2675-519X

The three most populous municipalities of the studied area Barbalha, Crato and Juazeiro do Norte, stand out for presenting net migration balance in the two subperiods. It was also observed that the profile of the migrant changes over the years in agreement with the literature as, for example, Justo and Silveira Neto (2006). In the present study, the most significant change was observed in the activity sector and in the income bracket, which was higher.

The selectivity hypothesis was identified in agreement with other works such as Cavalcante and Justo (2017), even after the correction of the sample bias. Thus, it has that the migrant presents unobservable characteristics that make him/her positively selected.

Among the determinants of migration, also in agreement with the literature, it was identified that being young, male, single, with higher education, without children and residing in the urban area, positively affects the decision to migrate between the municipalities of southern Ceará in the two subperiods.

Thus, we have that the elaboration of policies that seek to secure the population in its place of origin, should prioritize the creation of job opportunities for younger individuals and with higher education, avoiding the flight of human capital from the smaller municipalities and concentrating it in the more populous ones..

References

BAENINGER, R. Novos Espaços da Migração no Brasil: Anos 80 e 90. In: Encontro Nacional de Estudos Populacionais, 12, 2000, Caxambu - MG. **Anais...** Belo Horizonte - MG: ABEP, 2000.

CAVALCANTE, W. V.; JUSTO, W. R. Migração de retorno para o nordeste e o impacto sobre a renda dos estados no período de 2003-2012. In: SILVA, F. J. F.; HIDALGO, A. B.; LAPROVITEIRA, A. C. A. (Org.). **V ENPECON**: Transformações da estrutura produtiva de Pernambuco. 1. ed. Recife: UFPE, 2017, p. 237-268.

CHAVES, A. L. L. Determinação dos rendimentos na Região Metropolitana de Porto Alegre: uma verificação empírica da teoria do capital humano. **Ensaios FEE**, Porto Alegre, v.23, Número Especial, p.399-420, 2002.

Rev. Pemo, Fortaleza, v. 3, n. 3, e337174, 2021
DOI: https://doi.org/10.47149/pemo.v3i3.7174
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

FUNCEME. **Funceme finaliza Zoneamento Agroecológico da Mesorregião do Sul Cearense**. 2010. Disponível em: <http://www.funceme.br/index.php/comunicacao/noticias /381-funceme-finaliza-zoneamento-agroecologico-da-mesorregiao-do-sul-cearense>. Acesso em: 08 abr. 2016.

GREENE, W. H. **Econometric Analysis**. Pearson Education Limited.Seventh Edition: England, 2012. 1241p.

HECKMAN, J. J. Sample selection bias as a specification error. **Econometrica**, v. 47, n. 1, p. 153-161, 1979.

IBGE. **Municípios com suas áreas e populações 2010**. Disponível em: http://www.cidades.ibge.gov.br/xtras/uf.php?lang=&coduf=23&search=ceara. Acesso em: 07 set. 2016.

IBGE. **Estado do Ceará**. Disponível em: http://www.ibge.gov.br/estadosat/perfil.php?sigla=ce. Acesso em: 07 set. 2016.

IPECE. **Ceará em Mapas:** Informações georreferenciadas e especializadas para os 184 municípios cearenses. 2007. Disponível em: http://www2.ipece.ce.gov.br/atlas/capitulo1/11/129.htm. Acesso em: 07 set. 2016.

JUSTO. W. R. Migração para e da Região Metropolitana do Cariri nas últimas duas décadas**. Revista Eletrônica de Estudos Urbanos e Regionais,** n. 22, p. 26-35, 2015.

JUSTO, W. R.; SILVEIRA NETO, R. M. Migração e teoria econômica neoclássica. **Revista Economia Em Debate**, ano 2, n. 2, 2008.

JUSTO, W. R.; SILVEIRA NETO, R. M. Migração inter-regional no Brasil: evidencias a partir de um modelo espacial. **Economia**, v. 7, n. 1, p. 163-187, 2006.

JUSTO, W. R.; SILVEIRA NETO, R. M. Migração e seleção: evidências para o Brasil. In: JUSTO, W. R.; SOUSA, E. P.; SOUZA, F. L. M. (Org.). **Sociedade, Políticas Públicas e Desenvolvimento.** 1. ed. Fortaleza: UECE, 2012.

JUSTO, W. R.; SILVEIRA NETO, R. M. O que determina a Migração Interestadual no Brasil?: Um Modelo Espacial para o Período 1980-2000. **Revista Econômica do Nordeste**, v.39, n.4, out-dez, p.428-447. Fortaleza: BNB, 2009.

JUSTO, W. R.; FERREIRA, R. A.; LIMA C. F.; MARTINS, G. N. Os determinantes da migração e da migração de retorno intermunicipal no Brasil. In: Encontro Nacional de Economia, 38., 2010, Salvador - BA. **Anais...** Salvador - BA: ANPEC, 2010.

Rev. Pemo, Fortaleza, v. 3, n. 3, e337174, 2021
DOI: https://doi.org/10.47149/pemo.v3i3.7174
https://revistas.uece.br/index.php/revpemo
ISSN: 2675-519X

MARTINE, G.; CAMARGO, L. Crescimento e Distribuição da População Brasileira: Tendências Recentes. **Revista Brasileira de Estudos De População,** v. 01, n. 01, ano 3, p. 99-144, 1984.

MENEZES FILHO, N. Equações de Rendimentos: Questões Metodológicas. In: CORSEUIL, H. C.; FERNANDES, R.; MENEZES FILHO, N.; COELHO, A. M.; SANTOS, D. D. (Org.). **Estrutura Salarial:** aspectos conceituais e novos resultados para o Brasil. 1. ed. Rio de Janeiro: IPEA, 2002, v. 1, p. 51-66.

MINCER, J. **Schooling, Experience, and Earnings**. New York: Columbia University Press, 1974.

RAVENSTEIN, E. C. As leis da migração. In: MOURA, H. A. (Org.). **Migração interna:** textos selecionados. Fortaleza, BNB/ETENE, p. 19-88, 1980.

SANTOS, M.; SILVEIRA, L. M. **O Brasil:** território e sociedade no início do século XXI. 5. ed. Rio de Janeiro: Record, 2003.

SANTOS, R. B. **Migração no Brasil**. São Paulo, Editora Scipione. 1997.

SINGER, P. I. Migrações internas: considerações teóricas sobre o seu estudo. In: MOURA, H. A. (Org.). **Migração interna:** textos selecionados. Fortaleza: BNB/ETENE, p. 211- 244, 1980.

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Editora responsável: Cristine Brandenburg

Especialista *ad hoc*: Ana Luiza Rios Martins

Como citar este artigo (ABNT):
LOPES, Anderson Avelino; JUSTO, Wellington Ribeiro; ALENCAR, Matheus Oliveira de. Migração intermunicipal na Mesorregião Sul Cearense nos períodos de 1995-2000 e 2005-2010. **Rev. Pemo**, Fortaleza, v. 3, n. 3, e337174, 2021. Disponível em: https://doi.org/10.47149/pemo.v3i3.7174

Recebido em 10 de julho de 2021.
Aceito em 30 de setembro de 2021.
Publicado em 10 de outubro de 2021.