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Family Networks and Urban Out-Migration in the Brazilian Amazon
Extended Abstract

Introduction

In 2000 nearly half of the world's population lived in urban areas, and by 2030 over 60% of the global population is expected to live in cities (Cohen 2006). As levels of urbanization rise throughout the world, it becomes increasingly important to understand the factors driving migrants out of cities and into other cities or rural areas. Despite the growing role that cities play in generating population flows, the majority of internal migration research continues to focus on rural-to-urban migration. As a result, research on urban out-migration remains limited, particularly in developing countries (Reed *et al* 2010). The few studies that compare different types of migration streams (e.g., rural-urban versus urban-urban) have demonstrated that differences exist between the drivers of urban out-migration and those of rural out-migration (Fussell & Massey 2004; Reed *et al* 2010; Shefer & Steinvortz 1993). These studies indicate that macro factors (e.g., unemployment rates) and micro factors (e.g., educational attainment) impact urban and rural out-migration streams differently. Further research into how drivers of migration and migrant selectivity function in urban settings will shed more light on the ways in which migration processes differ between urban and rural areas.

The Brazilian Amazon has experienced steady urbanization for decades, and according to the 2007 census, 69% of the population of the Amazon was concentrated in urban areas (Costa & Brondizio 2009). In addition, there is evidence of high levels of inter-urban movement within the Amazon region, suggesting that urban networks may be an important driver of urban out-migration in the region's cities (Costa & Brondizio 2009). In this paper we examine urban out-migration among youth and young adults from two medium-sized cities: Santarém (population 215,000) and Altamira (population 84,000), located in the state of Pará in the Amazon region. Both Altamira and Santarém are regional hubs in Pará State, but they are substantially smaller than the largest cities in the Amazon, Belém and Manaus, which each have populations greater than one million. Because of the relatively small size of these cities as compared to Brazil's larger urban areas, limited opportunity for upward mobility exists, particularly among those with the highest levels of educational attainment. Large economic disparities exist between the different regions of Brazil, as the per capita GDP in the South, Southeast, and Central West regions are two to three times higher than that in the North and Northeast regions (Aguayo-Tellez *et al* 2010). Therefore, we might expect most migrants in Santarém and Altamira (located in the North region) to migrate to the high-GDP South, Southwest, or Central West regions of Brazil.

In this paper we examine the characteristics of young urban out-migrants from these two cities, including their migration destinations. Building on existing literature (which focuses primarily on either rural-urban migration or international migration), we test whether and to what degree drivers of urban out-migration in the Brazilian Amazon support theories on the roles of family migrant networks, focusing primarily on the migration experience of siblings. We focus on both destination and timing of migration. We examine how migrant destination choice correlates with the current location of siblings and we analyze the structure and timing of migration among children within each household in order to determine whether patterns exist between age, sex, and order of sibling migration. We use an event history model to study

multivariate relationships between timing of migration and several individual- and household-level factors, including siblings' migration experience, sex, education, migrant's place of birth, parents' place of birth, and whether the household is headed by a single female. In addition, we use a multinomial logit model to predict an individual's destination choice based on individual- and household-level factors as well as the current location of siblings.

Migrant Network Theories and Expected Outcomes

Theories on migrant networks can be used to explain migration decisions as well as the destination choices of migrants (Massey 1990). The presence of migrant networks (family members and friends) in a destination area substantially reduces the costs of migration, as family and friends act as sources of information and resources to a potential migrant. Migrant network theory breaks networks into strong ties (close family members and friends) and weak ties (distant family and acquaintances) and these have been shown to impact migration decisions differently. For example, a study of domestic migration in Mexico finds that strong ties among close kin have the greatest impact on migration choices (Davis et al. 2002), while a study of internal rural-urban migration in Thailand finds that weak ties play a stronger role in influencing migration decisions than strong ties (Garip 2008). Garip argues that family ties in this context generally serve as information on low paying agricultural or construction opportunities, while community ties to other young migrants offer information on higher wage opportunities in cities. This finding is less relevant in the case of urban out-migration, as family ties are likely to offer valuable information on urban job opportunities. As such, we have chosen to focus our study on strong ties, represented by the migration experience of siblings.

Our first hypothesis focuses on migration decisions. We predict that individuals with migrant siblings will have more extensive networks, resources, and support structures in destination locations, and will thus have a higher likelihood of migrating than individuals whose siblings have remained in the study city. Palloni et al. (2001) find this to be true in the case of Mexico-US migration. Having a migrant older sibling reduces time to migration, lessens the likelihood of an individual not migrating by age 30, and lowers the age of first migration. We test whether this phenomena holds true in the case of internal urban out-migration.

Our second hypothesis focuses on migrant destination choice. One possible outcome is that migrants are likely to move to locations in which their siblings currently reside due to the presence of networks in those locations. Davis et al. (2002) examine internal migration in Mexico and find a strong positive correlation between the destination location of a migrant and the migration destinations of household members. In contrast, households may seek to diversify sources of income, and may thus send migrants to different locations so that they can pursue different employment opportunities. This strategy would protect households from local or regional economic downturns in a particular destination city, as the household would continue to gain income from another child in a different destination city. Additionally, households may differentially invest in moves by sending certain children to more distant (and thus more costly) destinations, while sending other children to nearby, less costly cities. A finding that destination locations are correlated between siblings would support the first theory on network effects, while a finding that siblings tend to migrate to different destination cities would support the theory that income diversification playing a stronger role than network effects.

Our third hypothesis examines the timing of migration of siblings within a household. We will examine how the order of leaving the household is structured by age and sex. We hypothesize that if economic returns to the household (earnings capacity and remitting behavior) vary by sex of the child, we will observe a distinct pattern of the relative timing of migration between sons and daughters within a household. In contrast, if expected economic returns tend

to be equal between sons and daughters, we expect to observe migration of children structured more strongly by age of the child.

Data & Analysis

This study utilizes survey data from 1000 randomly selected urban households in Altamira and Santarém (500 households from each city). Data were collected in 2009 in Santarém and 2010 in Altamira from the female head of household, or from the male household head if there was no female head. Topics in the survey included the migration histories of the female and male household heads, information on members of the domestic unit, information on the respondents’ parents and in-laws, information on the respondents’ reproductive history and children, housing characteristics, asset ownership, and property and inheritance history. This dataset allows us to compare characteristics of individuals who migrated out of Altamira or Santarém with those of individuals who stayed in their home city. In addition, the multi-generational nature of the survey – which contains information on household heads/spouses and their children – allows us to examine how family networks are linked with migration outcomes of children.

Our analysis focuses on the recent migration of youth and young adults from these two cities. According to the data, the majority of migration from Altamira and Santarém occurs when the migrant is between the ages of 13-30, so we consider this age range the at-risk period of migration. Thus, the risk period of migration is the time during the 10 years prior to the survey during which the respondent was between the ages of 13 and 30. We define a migrant as an individual who has moved outside of the study city in the past 10 years and currently resides in another location in Pará or another state within Brazil. Our final sample is composed of 1145 children from 558 households (1042 non-migrants and 103 migrants). Table 1 provides an overview of migrant destinations.

Table 1. Migrant Destinations

<i>Destination Area</i>	<u>Number</u>	<u>Percent</u>
Amazonas State	27	26.7
Pará State:		
Belém	13	12.9
Other	35	34.6
Other states in North Region	13	12.9
Northeast Region	1	0.9
Southeast Region	6	5.9
South Region	3	2.9
Central West Region	3	2.9
<i>Destination Type</i>		
Urban	91	90.1
Rural	10	9.9
Total	101	

Note: 2 respondents had missing data on destination area and/or type

Table 1 indicates that most migrants moved within the state of Pará. In addition, nearly 27% of migrants moved to the state of Amazonas, and most of those moves were likely to Manaus, one of the two largest cities in the Amazon. Nearly 13% moved to other states in the North, which are also part of the legal Amazon region. This indicates that the majority of migration out of Altamira and Santarém (87%) occurs within the Amazon region as opposed to

higher GDP regions of the country, supporting the idea that strong urban Amazon networks exist, as discussed in Costa and Brondizio (2009). Migrants are likely to move to cities within the Amazon due to the presence of migrant networks in these areas, as well as the lower cost of moving to a relatively close destination area as compared to a more distant city, such as São Paulo.

Individual-level independent variables in the analysis include age, sex, educational attainment, whether the individual was born in the survey city, whether the individual is currently a student, and if an individual has at least one sibling who is a migrant. Household-level variables include whether the household head is a female (with no male household head) and the place in which the individual's parents were born. A fixed-effects variable for the city of the survey was included in order to test whether significant differences in the predictors of migration exist between the cities.

In order to examine the factors associated with the likelihood of migration out of Altamira or Santarém as well as the timing of sibling migration (our first and third hypotheses), we will use a multilevel binary event history model to account for the clustering of individuals within households. Individuals from the same household are likely to share unobserved characteristics, and are thus likely to have correlated standard errors. We will use a two-level model which includes a household-level standard error component in order to adjust for the clustering of individuals within households. We will use a discrete-time hazard model to estimate the risk of first migration among children of the household head between ages 13 and 30 in the ten years prior to the survey. The individuals in the sample below age 13 ten years prior to the survey are subject to delayed entry, and right censoring occurs either when an individual reaches the age of 31 years or at the year of the survey. Additionally, in order to examine how migrant destination decisions are correlated between siblings (our second hypothesis), we will use a multinomial logistic regression model in order to predict an individual's choice of destination (no migration, migration to Amazonas state, migration to Belém, migration to another location in the North region, or migration to another region in Brazil) based on individual- and household-level variables as well as the current locations of siblings.

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