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Is Internal Migration Bad for Receiving Urban Centres?

Evidence from Brazil, 1995-2000

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Abstract

During the twentieth century, internal migration and urbanization shaped Brazil's economic and social landscape. Cities grew tremendously, while immigration participated in the rapid urbanization process and the redistribution of poverty between rural and urban areas. In 1950, about a third of Brazil's population lived in cities; this figure grew to approximately 80 per cent by the end of the nineteenth century. The Brazilian population redistributed unevenly—some dynamic regions became population magnets, and some neighbourhoods within cities became gateway clusters in which the effects of immigration proved particularly salient. This study asks, has domestic migration to cities been part of a healthy process of economic transition and mobility for the country and its households? Or has it been a perverse trap?

Keywords: urbanization, migration, mobility, poverty, households, Brazil
JEL classification: R2, O54, N96

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Tables and figures appear at the end of the paper.

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1 Introduction

During the twentieth century, internal migration and urbanization shaped Brazil's economic and social landscape. Cities grew tremendously, while immigration participated in the rapid urbanization process and the redistribution of poverty between rural and urban areas. One third of the population lived in cities in 1950, but with an average yearly urban growth rate of 5 per cent Brazil turned into a prominently urban country (80 per cent of the population at the turn of the century). Due to immigration to urban centres, the Brazilian population redistributed unevenly: some dynamic regions became population magnets, and some neighbourhoods within cities became gateway clusters in which the effects of immigration proved particularly salient. But has domestic migration to cities been part of a healthy process of economic transition and mobility for the country and its households, or a perverse trap? To date, no evidence exists for Brazil but worldwide data has been used to show that if urbanization fostered economic growth and helped reduce absolute poverty in the aggregate, it did little for urban poverty (worldwide data decomposition by Ravallion et al. 2007).

Rapid urbanization placed strong pressure on cities to use their limited resources to meet or facilitate the increased demand for basic services; local authorities, denizens and newcomers had to adapt to non-natural population growth, its labour market and organizational implications. Receiving areas (in particular local authorities) have been challenged by immigration that added to near-term demands for water and sanitation, solid waste removal, electricity, basic education and health, housing, transportation, traffic and pollution (CEPAL/HABITAT 2001). The local population has had to deal with immigrants who came from different socioeconomic backgrounds, and older immigrants with individuals who were channelled to the city through their own network connections. Immigrants too had to adapt to new environments, find housing and transportation, and learn new skills. However, while most urban planners (as well as the poor themselves) can pinpoint the most pressing needs induced by immigration in their municipalities, careful quantitative assessments of the impact of domestic immigration on cities' poverty rates and access to public goods are still few and far between.

In Brazil, migration was mainly from rural to urban municipalities during 1950-70. Migrants benefited from widespread access to social infrastructure and migration was linked to upward social mobility (Faria 1991). Starting in the 1970s, immigration led to the outbreak of *favelas* and internal migrants started preferring medium-sized cities (100,000 to 500,000 inhabitants), due to the limited absorption capacity of the largest cities.

More recently, and in a country where more than four-fifths of the population is already urban, spatial movements have changed and urban-urban (UU) flows currently predominate. The main bulk of migration operates between urban centres (62 per cent), followed by rural to urban (18 per cent), urban to rural (13 per cent) and rural to rural (7 per cent) migration. The pattern of migration has diversified in terms of places of origin and destination—migrants come from all state and do not choose exclusively the southern regions, and prefer medium-sized cities to megalopolises. Positive selection happened along educational attainment: 27 per cent of the highly educated population of rural areas migrated (between 8 and 12 per cent for all other categories of education; 13 per cent of the urban population with a higher education leave, versus 7 per cent for non-educated urban emigrants). Richer rural localities experience higher rates of emigration, with a larger proportion of the migrants moving within their municipality and a smaller proportion moving out-of state. While the

richest quintile shows out-migration rates of above 16 per cent, the poorest quintile hardly reaches 7 per cent,[1] less than half of the former.

Understanding whether receiving cities incur higher social costs due to immigration is fundamental for local urban authorities to turn immigration into a healthy process of mobility for the country and its households. Although lately urban population growth resulted mainly from natural population growth in Brazil (Bilsborrow 1998), immigration continues to play a substantial role and has been shown to be correlated with slums development. Many immigrants with low adaptive capacity find themselves crowded into densely packed shanty towns because of the lack of affordable housing, little or no access to resources such as safe water and public health services. The policy issues surrounding immigration to urban centres transcend urban population growth alone.

Such issues as the consequences of migration for overall poverty are of paramount importance, even beyond any considerations of pressures on infrastructure stemming from rapid urban growth. Overcrowding due to high rates of immigration has been shown to be correlated with higher morbidity and mortality—see the evidence on tuberculosis in São Paulo in Ferreira et al. (2001). Cities have also become areas of massive sprawl and serious environmental problems. In São Paulo many workers travel to and from work by bus, spending around four hours per journey due to the extensive sprawl (over 500 undulating square miles), and the subway lines are no longer sufficient. The four million cars that circulate daily through the city have caused such severe pollution that officials have placed pollution monitors around the city to inform residents about air conditions (Robinson 1989).

In spite of five decades of abundant research, some key policy questions on the impact of internal immigration have not found clear answers yet. Do immigrants increase poverty rates of the city of arrival? Do they entail reductions in welfare of the resident population? What type of immigrants is particularly harmful or beneficial for receiving cities? Do receiving cities keep up with the same provision of public services (such as sewage connection, garbage removal, street parking and lighting) when they incur higher immigration rates? Do higher immigration rates lead to higher geographical segregation within receiving cities?

Empirical evidence on the role of internal migration in less developed countries (LDCs) has thus lagged behind because of issues related to data scarcity. First, data was scarce and coverage was not exhaustive. Second, many studies failed to account for self-selection into migration. Third, omitted variables that were not observed by the researcher could be driving both immigration inflows and housing costs. Immigrants maybe responded to other factors that caused poverty to decrease, such as expectations of future economic growth, improved amenities, or changes in the preferences for existing amenities, which could lead to an overestimation of the impact of immigration. Fourth, immigration could be endogenous, as immigrants may be looking for better deals. They might settle in areas where poverty is decreasing more rapidly, so that if immigration inflows are very sensitive to poverty and amenities changes, then the estimates of the relation between immigration and poverty and infrastructure access could be biased downward.

Our analysis is novel in three respects: most studies used specific household surveys on migration; representative for a geographic subsample of the population; using limited information on place of origin of immigrants (region born or moved from). First, we use

[1] Author's computation.

census data representative at the municipality level for the whole country of Brazil. Our data come from the 12.5 per cent sample of Brazil's 2000 census, which includes a detailed migration questionnaire at the individual level—current and last place of residence, place of residence in 1995, state of birth. The place of residence today and in 1995 is recorded at the municipality level. This contrasts with most of the data on internal migration; census and sample survey data normally report only a limited range of population movements (place of current residence and place of birth only are listed in the records, disaggregation of the place of origin is rough) (few regions, sometimes distinction between urban and rural). Naturally, this precludes estimation of the extent of rural-urban mobility within a region, from the date of birth. Second, to draw causality inferences, we instrument immigration rates to a receiving city by the combination of three variables: adverse economic shocks in the municipality of departure, proportion of emigrants from the municipality of departure and Euclidian distance between the municipality of origin and that of arrival. While the first two variables explain the urge to leave one's place, the last explains the choice of the place of arrival. Third, we look at poverty rates and infrastructure access, not average income only: after having selected different welfare measures (monetary poverty, basic infrastructure accessibility), we choose to look at the effect of immigration on municipalities' revenues and spending, and eventually at the geographic polarization of populations within cities of arrival.

2 Empirical specifications

Immigration is a process by which immigrants change location in order to improve their expected welfare status. The decision to leave can either be (i) a voluntary choice or (ii) an involuntary resettlement due to the consequence of adverse conditions at the place of origin (covariate shocks such as climate change or crisis; idiosyncratic shocks such as job loss or the death of a household member).

Voluntary migration concerns people who (i) are intrinsically mobile. Those migrants may have observable characteristics that explain their preference for mobility: gender, season-related jobs, no family, unfinished education that requires moving to a larger urban centre, highly demanded skills that they can value, adaptive, polyvalent and interchangeable abilities. They may also have unobservable characteristics that explain their geographic flexibility (personal history and preferences). (ii) They may have relatively more reliable information on where they are going to and will not be afraid to migrate far: better access to information in general, personal effort engaged to collect information and to ensure that migration will offer them better opportunities, network of friends or family who has already migrated. (iii) Voluntary migrants are taking rational decisions: they have already secured positions in the place they are going to, whether it be through network connections or because they were offered a higher position in the place of arrival. Rationality implies that individuals with better education, skills and labour market experience have a comparative advantage in job search at destination labour markets, and therefore are more likely to migrate. Thus voluntary migration is seen as a selective, rather than random, process, and whilst migrants self-select in this way, the same logic of rationality implies that non-migrants do not move because their comparative advantage lies in staying.

Involuntary resettlement will affect (i) regions most vulnerable to shocks. Regions which economies are agriculturally-based will be more affected by weather shocks; municipalities where economic output is concentrated on few activities will be more vulnerable to changes

in economic activity. (ii) Unplanned immigration will affect disproportionately the most vulnerable: poorer individuals, households with highly volatile income, single-headed families, older people, and individuals with the least adaptive skills. Consequently, it can be derived that other things being equal, unplanned immigration is more likely to originate from ex ante worse-off groups, less educated and less skilled. The decision to migrate here is not always imposed stricto-senso[2] on households. Rather, we call involuntary immigration a process of resettlement that does not represent an attractive alternative, but a process chosen out of necessity, a last resort option. Because poorer households face tighter financial constraints, migration costs may limit the set of available destination choices (close-by cities), and therefore the potential benefits of mobility. The implication is that in the latter case migration is likely to exacerbate poverty and vulnerability as involuntary immigrants may suffer from social exclusion in the place of arrival (inequitable access to economic assets: savings), human capital (education), social capital (networks), cultural capital (ethnicity), geography (distance from economic activity) and political capital (participation).

Our empirical specifications will try to answer the following questions: what is the impact of higher immigration intake on poverty rates at the city of arrival? Does voluntary (as opposed to involuntary) immigration generate lower levels of poverty, higher revenues per capita, an improvement of housing facilities and public infrastructure access? Are less adaptive groups increasing poverty rates? Is the impact of immigration modified by the absorption capacity of the receiving city? Is it modified by the complementarities between natives and migrants on the labour market? Are municipalities investing more in private and public infrastructure where immigration is higher? Do urban centres experience higher polarization rates?

2.1 Overall impact of immigration

Let *Y* refer successively to one of the poverty and infrastructure access indicators mentioned above.[3] Equation (2) shows the impact of migration rates on poverty measures:

$$Y_{00,c} = \alpha + \beta\, inmig_{00,c} + \vartheta' X_{95,c} + \epsilon_{00,c}$$

where *00* stands for year 2000, *c* denotes the urban municipality of arrival and *inmig* represents immigration rate to the city of arrival.[4] *X* is a set of municipality controls in 1995 (such as city size, state of localization, government spending), out-migration rates and natural population growth between 1995 and 2000. ε is a normally distributed error term. The coefficient of interest here is β. Since immigration rates respond to differences in regional utilities, they are endogenous to $Y_{00,c}$, i.e. $Cov(inmig_{00,c}, Y_{00,c}) \neq 0$. Due to reverse causality between $Y_{00,c}$ and $inmig_{00,c}$, and to correctly estimate β, we choose to instrument migration rates *inmig* with the coefficient of variation of the unemployment rate in *m* (CV_m), the logarithm of the distance to migrate between *m* and *c* ($ln(dist_{m,c})$), and the interaction of CV_m and $ln(dist_{m,c})$.

Immigration from municipality *m* to city *c* is the consequence of the combination of factors in m, in *c* and the difference in these factors between *m* and *c*. Individuals are more likely to

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[2] The restrictive understanding embraces wars, ethnic or racial cleansing, development-induced relocation.

[3] Headcount ratio, income inequality and polarization measures, public infrastructure access (water, electricity, sewage connection, garbage removal), inequality and polarization of access to infrastructure.

[4] Proportion of immigrants out of total city population, that is $inmig_{00,c} = \frac{\sum_{mac} mig_{m \to c \text{ en } 00}}{pop_{00,c}}$

take the decision to migrate if the economic situation they are facing at the place of origin (*m*) is bad or getting worse. When choosing *c*, potential migrants will take into account the characteristics of the place of arrival: job opportunities, wages, employment rates, amenities, situation improvement (difference between situation at *c* and *m*), distance to travel. The only variables exogenous to the situation of c in 2000 are the economic situation at m and the distance between *m* and *c*. Hence:

- As suggested by migration models, economic instability at the place of origin is often found to be highly positively correlated with the propensity to emigrate (variation in climate, employment rates, political situation, violence and safety). We select the coefficient of variation of the unemployment rate in m (CVm) to measure how volatile economic opportunities are at the place of origin and thus how likely individuals are to leave their municipality hoping for a more stable environment.
- As suggested by gravity models, distance is an impediment to migration and is often found to be highly negatively correlated with the propensity to migrate. Migration decreases with increased distance from the origin for several reasons: distance is a proxy for direct (transportation) and psychic costs of moving. As distance increases, time spent traveling and not working increases (earnings foregone get larger). The farther away the new labour market, the more likely people's skills are to become unadapted (smaller income gains from migration). Information costs rise with distance: uncertainty about the final place of destination deters people living farther away from moving there. We thus draw heavily on the framework of gravity models, which explains relative attractiveness and repulsion by the size of each municipality (origin and destination): the larger the municipality, the more likely it is to become a centrifugal point ('city lights' factor), the smaller the municipality, the more likely it is to become a centripetal point: $mig_{A\to B} = \alpha + \beta\, ln(dist_{A\to B}) + \gamma\, pop_A + \delta\, pop_B + \epsilon$, where β and γ are assumed to be negative, and δ positive.

As a result, the set of instruments we construct consists of the coefficient of variation of the unemployment rate in m (CV_m), the logarithm of the distance to migrate between *m* and *c* ($ln(dist_{m,c})$), and the interaction of CV_m and $ln(dist_{m,c})$.

$$inst_{m,c} = (CV_m, \ln(dist_{m,c}), CV_m * \ln(dist_{m,c}))$$

Going back to equation (2), the endogenous variables (migration rate to city c) is defined as:

$$lnmig_{00,c} = \frac{1}{pop_c} \sum_{m=1}^{M} mig_{m\to c}$$

where $mig_{m\to c}$ is the migration flow between municipality m and the city of arrival *c* between 1995 and 2000. Each municipality to municipality migration flow $mig_{m\to c}$ is then instrumented by $inst_{m,c}$. As suggested by gravity models, we control for $ln(pop_{m,95})$ and $ln(pop_{c,95})$, the respective log-sizes of city of origin and destination before migration (included in $X_{95,m}$ and $X_{95,c}$). The first stage of our 2SLS method is thus:

$$\frac{mig_{m\to c}}{pop_c} = \pi_0 + \pi_1' inst_{m,c} + \pi_2' X_{95,m} + \pi_3' X_{95,c} + \pi_4' X_{00,c} + \eta_{m,c}$$

which is estimated with geographic fixed effects (municipality of origin). A larger value of CV_m means a more volatile labour market at origin m and thus a municipality m from which individuals are more likely to leave. We can assume that m's economic condition will not have any direct effect on c's economic conditions (poverty, inequality, infrastructure access, and public finance) other than through immigration rates. A larger value of $ln(dist_{m,c})$ means more distant municipalities, higher costs of migration: c is a potentially less attractive place to choose from. We can assume that travel distance will not have any direct effect on poverty, inequality or infrastructure access of the place of arrival. The interaction of CV_m and $ln(dist_{m,c})$ ensures that the first-stage equation is not equivalent to fixed-effect model. Since none of the components of $inst_{m,c}$ are assumed to have a direct impact on $Y_{00,c}$, $inst_{m,c}$ validates the exclusion restriction.

From the first-stage equation (4), we predict $\widehat{inmig}_c = \sum_{m=1}^{c} \widehat{mig}_{m\to c}/pop_c$ and estimate the second-stage equation (2). Instead of using $\beta_{OLS} = (inmig_{00,c}' inmig_{00,c})^{-1} inmig_{00,c}' Y_{00,c}$, we correct the standard errors on β using McFadden's correction method. The two-stage least squares (2SLS) estimate $\beta_{2SLS} = (\widehat{inmig}_{00,c}' \widehat{inmig}_{00,c})^{-1} \widehat{inmig}_{00,c}' Y_{00,c}$, is obtained by regressing (OLS) setting the explanatory variable $inmig_{00,c}$ on the instrument $inst_{m,c}$, computing fitted values $\widehat{inmig}_{00,c}$, and again regressing (OLS) Y on $\widehat{inmig}_{00,c}$ to obtain the I.V. estimator β_{2SLS}. Had we not corrected the standard errors, we would have estimated the variance of the second-stage regression (equation (2)) based on the residuals $\hat{\epsilon}_{00,c} = Y - \beta_{2SLS} \widehat{inmig}_{00,c}$, which is asymptotically biased upward (see Engle (2011) for proof). Instead, we use the consistent estimate of σ^2 given by $\epsilon_{00,c} = Y - \beta_{2SLS} inmig_{00,c}$.

2.2 Impact of different groups of migrants

To analyse the differential impact of immigration rates of different nature, we then construct several vectors of migration rates $inmig_{00,c}$:

- urban and rural migrants from the municipality, the state, out-of state,
- gender-age categories,
- no education, primary, secondary, and higher education,
- length of stay.

$$Y_{00,c} = \alpha + \beta' inmig_{00,c} + \vartheta' X_{95,c} + \epsilon_{00,c}$$

where $inmig_{00,c}$ is a vector of mutually exclusive immigration rates to c by category i ($i \in C$).

Each migration rate of group i to city c is defined as:

$$tnmig_{i,c} = \frac{1}{pop_c} \sum_{m=1}^{M} mig_{i,m \to c}$$

We run a separate regression for each new vector. In this case, since we need to construct as many instruments as RHS endogenous variables, we chose add the number of emigrants (from each category: urban and rural, men and women, etc.) from the municipality of departure ($mig_{i,m}$), and the interaction term $CV * \ln(dist) * mig_{i,m}$. The number of people who left from municipality *m* to city *c* is correlated with the total number who left municipality *m* between 1995 and 2000. However, we assume that the total number of people who left *m* is does not have a direct impact on poverty, inequality and infrastructure access at *c*. The first stages become:

$$\frac{mig_{i,m \to c}}{pop_c} = \pi_0 + \pi_1' inst_{i,m,c} + \pi_2' X_{95,m} + \pi_3' X_{95,c} + \pi_4' X_{00,c} + \eta_{m,c}$$

Individuals belonging to category *i* are assumed to be influenced in their decision to migrate by the attitude of their peers. But $mig_{i,m}$ should not affect directly the outcome variables $Y_{00,c}$ in the city of arrival *c* other than through $mig_{i,m \to c}$ since the number of migrants of group I to Belo Horizonte, Rio de Janeiro, and Campinas should not affect poverty measures in São Paulo. Each $mig_{i,m \to c}$ is hence instrumented by a combination of the $ln(dist_{m,c})$, CV_m and the likelihood that people from category *i* will migrate out of *m*. As before, we predict $\widehat{tnmig}_{i,c} = \sum_{m=1}^{c} \widehat{mig}_{i,m \to c} / pop_c$ and estimate the second-stage equation (5). Again, we correct the standard errors following Engle (2011).

3 Data

Most of the data comes from the 12.5 per cent module of Brazil's 2000 Population Census. The module collected individual-level information on age and gender, ethnicity, education and activity, migration, and income per capita. In addition, it collected household-level information about the structure and nature of housing, access to water, electricity, garbage removal, public lighting and street pavement. We also draw on a variety of indexes constructed by IBGE[5] and IPEA. Consumption-based poverty measures were obtained by Ferré and Leite (2006) using the technique of Small Area Estimates applied to the 2000 Census and the 2002-03 household survey (POF). The analysis is largely carried out at the municipality level (or metropolitan area for the largest cities)[6] of which Brazil counts 5,507 spread in 27 states, divided into 5 main regions (north, north-east, south-east, south, and centre-west). As most municipalities encompass an urban and a rural part, we further divide municipalities into two 'submunicipalities', each of them being exclusively urban or rural. The following migration flows were constructed:

[5] Instituto Brasileo de Geografía e Estadísticas (Brazilian Institute of Geography and Statistics).

[6] Urban centres are usually made of one municipality. However, the municipalities of the 25 largest agglomerations are grouped to form Metropolitan Areas.

- Origin: migrants can come from five different geographic origins. (i) Individuals can migrate from the rural part of a municipality to its urban part (intra-municipality migration). Individuals can migrate from (ii) an urban or (iii) a rural sub-municipality to an urban centre within the same state (intra-state migration). Or they can migrate from (iv) an urban or (v) a rural sub-municipality to an urban centre out of their state of origin (inter-state migration). All five categories are mutually exclusive.
- Education: we divided educational attainment into four categories: none, primary corresponding to 1-7 years of education, secondary corresponding to 8-11 years, and higher for any individual with more than 12 years of schooling.
- Age-gender: to isolate population groups that are most likely to migrate, we divide the population into four age-gender groups: male aged 20-35, other male, female (20-35) and other female. This structure corresponds to the findings of CEPAL/HABITAT (2001) on the age-gender structure of migration in Latin America and the Caribbean.
- Length of migration stay: to distinguish between recent and less recent migrants, we also divide immigration flows into 5 length-of-stay groups: less than one year, 1-2 years, 2-3, 3-4, 4-5.[7]

An important part of this paper centres on three poverty measures: the incidence of poverty (also called the headcount ratio, or FGT_0); the depth of poverty (FGT_1); and the severity of poverty (FGT_2). In addition, there are also numerous non-monetary dimensions of poverty, such as access to health and education services, public (transportation, sanitation, cleaning services) and private infrastructure access (water, power, garbage collection, etc.). In urban areas, housing problems are particularly salient and visible, in view of the high population density, which requires higher service standards for public and environmental safety, and does not readily permit traditional building methods. Due to the limitation of the data, we focus on four measures of infrastructure access: sewage (personal connection to the drainage system), garbage removal, street pavement and lighting[16]. We compute city- and census-track-level access to sewage, garbage removal, street pavement and lighting. We also compute polarization indexes to measure the degree to which the distribution of a variable is made of 'peaks' and the distance that separates those 'peaks' within a city. We complement infrastructure access with measures of government and citizen participation: municipality spending on urban projects, and on local development.[8]

As for the variables used for the instrument, the Euclidian distance between each pair of municipalities' centroids was computed using georeferenced techniques and led to a vector of 12.5 million distances. An index of unemployment volatility at the municipality of origin, using IPEA data on unemployment rates was computed. Unemployment series were available at the microregion level of which Brazil counts 500. For each microregion, the unemployment series were available for rural and urban populations separately. The coefficient of variation was computed over the first 5 years of the 1990s (1990-95).

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[7] It should be emphasized that we cannot account for less-than-five-year movements in the sequencing of migration episodes between 1995 and 2000. We will not be able to track people who migrated out and back to their original municipality within five years. Nor will we be able to track people who migrated more than once in the five-year period.

[8] Although electricity and water indicators were available, we decided to skip them due to quasi-universal coverage. All measures are per capita.

4 Findings

Table 2 shows the results of the first-stage (equations 4 and 7) for the regional breakdown of migrants.[9] For more clarity, the dependent variable $mig_{t,m\to c}/pop_c$ has been multiplied by 100 and can be interpreted as a percentage. $ln(dist_{m,c})$ is negatively correlated with migration between *m* and *c*, suggesting that distance is an impediment to population movements. Distance is more of an impediment to migrate for people moving within state. Similarly (the results are not presented here) people with less education, women and older people. This suggests that less adaptive and more vulnerable migrants incur higher costs to migrate due to distance. CV_m is negatively correlated with out-migration, confirming that people have more incentives to leave a municipality where employment is not stable. Employment volatility is a higher emigration factor for individuals of rural origin (Table 2), for uneducated migrants, older men and women, and it is increasingly more important for migrants who stayed longer in the receiving city. This again suggests that more vulnerable migrants have a higher probability of leaving due to adverse economic conditions in the place of departure. In equation (7), when the proportion of out-migrants from the municipality of origin of each sub-group category is displayed, it is always positively correlated with out-migration. Emigration from one's sociodemographic group is more of a push factor for people coming from urban background, the less educated, women and older people, suggesting that for those age groups 'group departure' happens more often.

4.1 Impact of immigration on poverty

Higher immigration rates entail reduction in overall and local poverty rates of the receiving cities Table 3). Looking at the magnitude of the coefficients (respectively -0.044 and -0.045), doubling the average immigration rate (10.2 per cent) would entail a reduction of 1.4 per cent of current urban poverty rates (HCR = 33 per cent with income). The results are confirmed by the regressions using SAEs (column 3), for which the magnitude of the coefficient is quite different (-0.029) but the same reasoning (doubling of the average immigration rates) would entail a reduction of 1.5 per cent of urban poverty rates (HCR = 20 per cent with consumption). All results are displayed in the first 3 columns of Table 3.

Reduction in poverty measures are largely due to rural and low educated immigrants, suggesting that when immigrants do not compete with locals (complementary productive tasks), poverty levels go down. Table 4 shows that immigrants with urban origins have no significant impact on poverty rates, suggesting that this category does not lead to any noticeable crossings of the poverty line. Figure 1 looks at per capita income differences between immigrants and locals; Figure 2 shows that urban immigrants earn slightly more than denizens. The income difference increases with age, even more so in the largest cities. On the other hand, immigrants with rural origins (coming from the same or another state) entail reductions in overall and local poverty rates, while migrants coming from the rural parts of the municipality participate in the relocalization of poverty in the urban neighbourhoods, without affecting the local population. Hence rural immigrants coming for far induce reduction in poverty of the local population, suggesting that local households benefit from the complementarities of locals and immigrants productive tasks.

[9] For the whole set of first-stages, please refer to the extended version of the paper.

Non-educated migrants (less than primary education) entail reductions in poverty rates of the local population, while highly educated migrants (secondary and higher) deteriorate the welfare situation of locals (see Table 6: IV Results, breakdown by educational attainment). The two stories (urban-rural and educational breakdowns) can be reconciled by Figure 1: immigrants from urban areas are over-represented among workers with very high skills where competition is likely to be high and substitution low, and immigrants from the municipality are over-represented in the 'no education' category which is most likely to be poor. On the other hand, immigrants from rural areas are slightly more represented in lower levels of educational attainment but only by little.

4.2 Impact of immigration on infrastructure access

Higher immigration rates lead to better access to public infrastructure (columns 4-7 of Table 3). Three out of the four indicators of access to public services (street paving and lighting, sewage connection and garbage removal) are positively affected by higher immigration rates: multiplying by two average immigration rates would entail an increase of 24 per cent of street lighting, 14 per cent of street paving and 29 per cent of garbage removal. Sewage connections do not seem to be affected, which can be explained by their relative inelasticity: extending the sewage network implies high costs to be borne by the municipality, requires qualified construction workers and takes time. The poorest rural immigrants (out-of state and from the municipality) are associated with worsening of public infrastructure access, especially street paving and lighting.

Higher rates of female immigration have a positive impact on infrastructure access. Larger intakes of women have a positive impact on garbage removal and street lighting (Table 7), suggesting women's preference for sanitation and safety. There is however no impact of 'time since migration' on those outcomes, invalidating the assumption that immigrants who planned to stay longer participated in improving access to public equipment.

Higher immigration rates entail lower spending per capita on urban projects.[10] However, public spending on urban projects increase with higher proportions of rural migrants and decreases with higher proportions of urban immigrants (column 8 of Table 4), suggesting that improvements in infrastructures access is rather well targeted.

4.3 Local emigration, spatial segregation, and polarization

Higher immigration intake does not lead to higher local emigration, or to polarization. Even breaking down immigration rates by origin, age-gender, education or years since- migration categories, no clear pattern seem to come out (see last column of Tables 2 to 6). Higher immigration rates don't seem to have an impact on polarization indexes either (Table 7) suggesting that recent immigration does not systematically lead to local selective emigration, by which people with the same socioeconomic background would converge to the same neighbourhoods. Even after decomposition into groups, there was no evidence of increased polarization due to higher immigration intake. Robustness checks were conducted using the structure of housing and no effect was found.

[10] Similar results were obtained using investment per capita on local development.

5 Conclusions

This paper goes against some current literature in migration patterns and urbanization. It provides evidence that domestic immigration to Brazil 5,500 cities reduced poverty, increased infrastructure access and did not increase local polarization and geographic segregation. The positive effect on poverty reduction is found to be mainly due to categories of migrants that have characteristics complementary to locals' (immigrants from rural origin, or with low educational attainment), while improvements in infrastructure access are mainly seen after higher intakes of female immigration.

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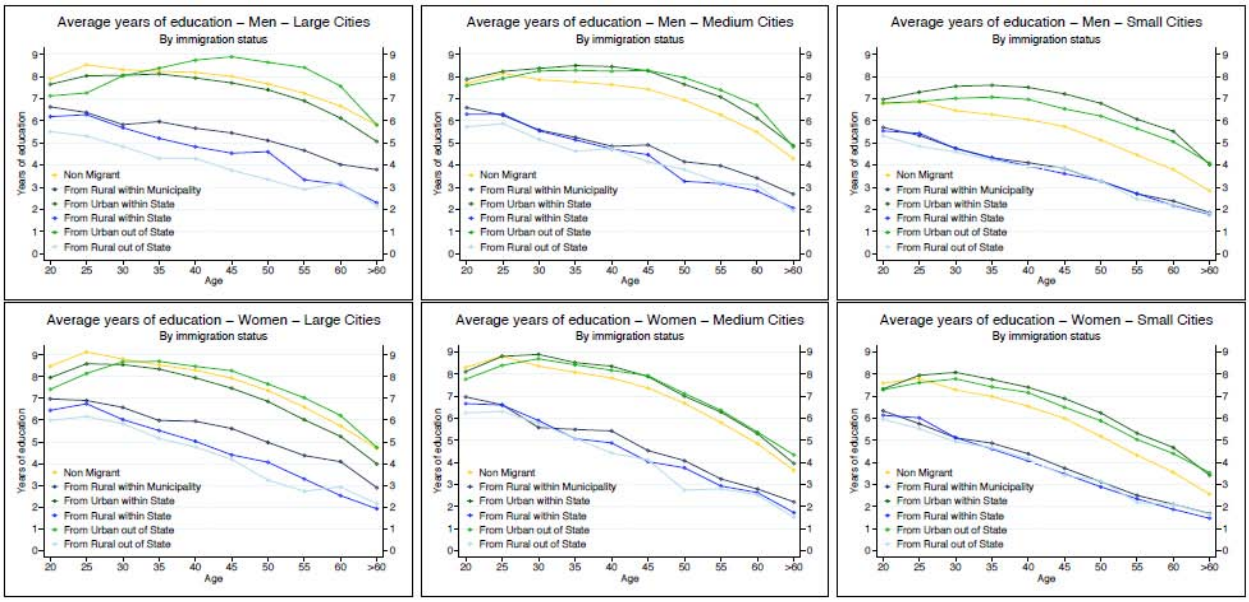
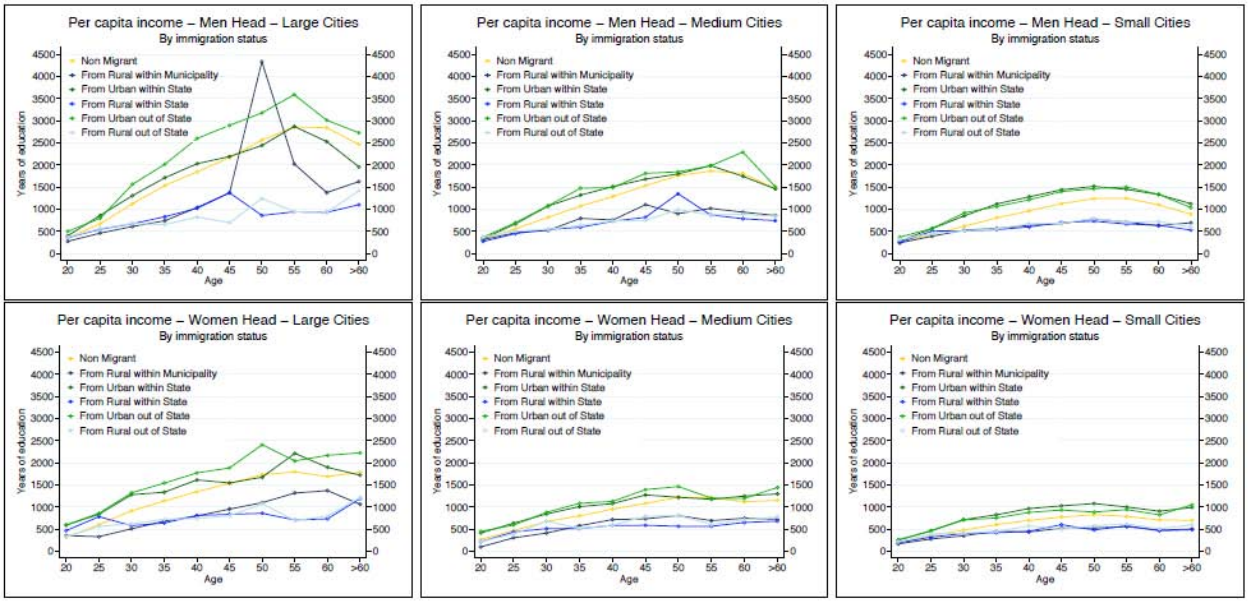
Figure 1: Education of migrants and denizens



Source: See section 3; author's computations.

Figure 2: Income of migrants and denizens



Source: See section 3; author's computations.

Table 1: Characteristics of the city of arrival by quintile of migration rate

	1st quintile	2nd quintile	3rd quintile	4th quintile	5th quintile
	Very Low Migration	Low Migration	Medium Migration	High Migration	Very High Migration
In-migration rates	5.9%	8.8%	11.3%	14.4%	23.6%
Size	41,879	31,570	22,423	13,676	11,904
Headcount	0.30	0.35	0.31	0.35	0.35
Gini	0.60	0.58	0.57	0.56	0.55
Theil	0.64	0.59	0.55	0.53	0.51
Water	0.96	0.95	0.97	0.95	0.93
Electricity	0.99	0.99	0.99	0.99	0.99
Garbage Removal	0.74	0.80	0.83	0.83	0.79
Sewage	0.58	0.54	0.51	0.40	0.27
Permanent House	0.28	0.27	0.27	0.27	0.26
Surdensity	0.006	0.006	0.005	0.005	0.006
Fecundity	2.17	2.32	2.33	2.54	2.67
Out-migration rate	0.09	0.08	0.09	0.10	0.10
% always lived in municipality	0.68	0.59	0.52	0.48	0.36
Primary Education	0.36	0.40	0.39	0.42	0.44
Secondary Education	0.27	0.28	0.29	0.29	0.31
Tertiary Education	0.28	0.26	0.26	0.24	0.22
Higher Education	0.09	0.07	0.06	0.04	0.03

Source: See section 3; author's computations.

Table 2: First stage: main specification and geographic breakdown

	All	From within municipality	From State (urban)	From State (rural)	From out-of state (urban)	From out-of state (rural)
CV * ln(dist)	-0.002		-0.022	-0.045***	-0.054***	-0.010
	(0.00)		(0.02)	(0.01)	(0.01)	(0.01)
CV	0.077	-0.672	0.393*	0.564***	0.822***	0.162
	(0.05)	(0.81)	(0.21)	(0.16)	(0.15)	(0.11)
ln(dist)	-0.070***		-0.187***	-0.145***	-0.001	-0.031***
	(0.00)		(0.01)	(0.01)	(0.01)	(0.01)
CV * ln(dist) * % emigration			-0.955**	0.175	-1.684***	-0.169
			(0.39)	(0.12)	(0.34)	(0.13)
% emigration		-35.894	29.813***	4.044***	38.310***	5.721***
		(27.98)	(2.62)	(1.03)	(3.42)	(1.53)
$\ln(pop_m)$	0.031***	0.515**	0.086***	0.091***	0.025***	0.005***
	(0.00)	(0.21)	(0.00)	(0.00)	(0.00)	(0.00)
$\ln(pop_c)$	-0.121***	-0.830**	-0.153***	-0.162***	-0.088***	-0.079***
	(0.00)	(0.33)	(0.00)	(0.00)	(0.00)	(0.00)
Controls	yes	yes	yes	yes	yes	yes
Constant	2.014***	1.329	3.124***	2.788***	1.204***	1.580***
	(0.05)	(2.00)	(0.17)	(0.17)	(0.09)	(0.11)
R^2 adj.	0.22	0.15	0.24	0.23	0.25	0.25
# obs.	222526	98	59024	51746	64012	49244

*Significance: * = p<0.10, ** = p<0.05, *** = p<0.01*

Source: See section 3; author's computations.

Table 3: IV Results, main specification

	HCR all	HCR local	HCR SAEs	Street Lighting	Street Paving	Garbage Removal	Connected to Sewage	Spending pc on urbanism	Share who leave munic
Immigration (%)	-0.043***	-0.043***	-0.028***	0.110***	0.087***	0.117***	-0.004	-29.930***	0.003
	(0.02)	(0.02)	(0.01)	(0.04)	(0.03)	(0.02)	(0.03)	(10.18)	(0.01)
ln (population)	-0.010***	-0.009***	-0.009***	0.084***	-0.012***	0.024***	0.034***	-30.084***	-0.015***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(1.43)	(0.00)
% men (20-35)	-0.526***	-0.598***	-0.162*	0.427*	0.051	0.388**	-0.111	287.480**	0.081
	(0.09)	(0.09)	(0.09)	(0.22)	(0.28)	(0.18)	(0.17)	(140.14)	(0.07)
% women (20-35)	-0.402***	-0.435***	-0.412***	-0.511**	0.457	0.913***	-0.195	27.916	0.790***
	(0.10)	(0.10)	(0.09)	(0.22)	(0.32)	(0.22)	(0.18)	(143.59)	(0.10)
% Primary education	-0.738***	-0.742***	-0.750***	0.452***	0.404***	0.378***	0.243***	71.580	-0.056**
	(0.04)	(0.04)	(0.04)	(0.09)	(0.13)	(0.07)	(0.08)	(56.85)	(0.02)
% Secondary education	-0.662***	-0.692***	-0.814***	0.412***	1.260***	0.348***	0.199***	76.648*	0.139***
	(0.03)	(0.04)	(0.03)	(0.07)	(0.12)	(0.06)	(0.07)	(40.08)	(0.03)
% Higher education	-1.501***	-1.541***	-1.260***	0.357**	3.179***	0.495***	1.681***	171.268*	0.239***
	(0.08)	(0.08)	(0.08)	(0.15)	(0.28)	(0.12)	(0.17)	(91.45)	(0.06)
% WASP	-0.293***	-0.305***	-0.182***	-0.089***	0.029	0.248***	0.313***	2.574	-0.046***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.05)	(0.02)	(0.02)	(13.25)	(0.01)
Density	-0.000	-0.000	0.000	-0.000***	-0.000	-0.000***	-0.000*	0.015***	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
State Density	0.000***	0.000***	0.000***	0.000***	0.001***	0.000***	0.001***	0.333***	-0.000**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.11)	(0.00)
Other Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes
Intercept	1.110***	1.117***	0.840***	-0.605***	-0.210***	-0.036	-0.532***	241.014***	0.256***
	(0.02)	(0.02)	(0.02)	(0.05)	(0.07)	(0.05)	(0.04)	(30.14)	(0.02)
R^2	0.86	0.86	0.79	0.51	0.47	0.62	0.69	0.16	0.31
# obs.	5502	5501	5501	3252	2220	5463	5463	4830	5502

*Significance: *= p<0.10, ** = p<0.05, *** = p<0.01*

Source: See section 3; author's computations.

Table 4: IV Results, geographic breakdown

	HCR all	HCR local	HCR SAEs	Street Lighting	Street Paving	Garbage Removal	Connected to Sewage	Spending pc on urbanism	Share who leave munic
Municipality	1.113*	0.873	1.160**	-1.572***	-0.499***	-2.641	0.452	1631.601	0.714
	(0.67)	(0.66)	(0.57)	(0.13)	(0.15)	(2.26)	(2.65)	(1228.16)	(1.01)
State (urban)	-0.024	-0.038	0.034	0.255**	0.127	-0.019	-0.140	-167.350**	-0.076**
	(0.05)	(0.05)	(0.05)	(0.12)	(0.17)	(0.09)	(0.13)	(71.22)	(0.03)
State (rural)	-0.123**	-0.136**	-0.081	0.457***	0.562***	0.419***	0.044	-54.541	0.044
	(0.06)	(0.06)	(0.06)	(0.14)	(0.20)	(0.11)	(0.14)	(76.76)	(0.04)
Out of state (urban)	0.039	0.103	-0.140	0.899***	0.142	0.365*	0.121	-508.199***	0.098
	(0.09)	(0.10)	(0.10)	(0.21)	(0.31)	(0.19)	(0.24)	(132.61)	(0.06)
Out of state (rural)	-0.177	-0.240*	0.068	-1.150***	-0.444	-0.347	-0.110	709.671***	-0.074
	(0.13)	(0.14)	(0.12)	(0.27)	(0.38)	(0.24)	(0.31)	(165.28)	(0.08)
ln (population)	-0.010***	-0.009***	-0.009***	0.087***	-0.011***	0.025***	0.034***	-30.628***	-0.015***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(1.45)	(0.00)
% men (20-35)	-0.512***	-0.580***	-0.162*	0.370*	-0.048	0.356*	-0.108	280.118**	0.080
	(0.09)	(0.09)	(0.09)	(0.21)	(0.28)	(0.18)	(0.17)	(139.58)	(0.07)
% women (20-35)	-0.395***	-0.426***	-0.416***	-0.427*	0.482	0.937***	-0.189	-8.658	0.797***
	(0.10)	(0.10)	(0.09)	(0.22)	(0.32)	(0.22)	(0.18)	(144.75)	(0.10)
% Primary education	-0.735***	-0.738***	-0.752***	0.429***	0.385***	0.373***	0.251***	78.289	-0.051**
	(0.04)	(0.04)	(0.04)	(0.09)	(0.13)	(0.07)	(0.08)	(57.19)	(0.02)
% Secondary education	-0.664***	-0.693***	-0.816***	0.414***	1.251***	0.353***	0.202***	75.997*	0.142***
	(0.03)	(0.04)	(0.03)	(0.07)	(0.12)	(0.06)	(0.07)	(39.98)	(0.03)
% Higher education	-1.510***	-1.555***	-1.255***	0.353**	3.208***	0.506***	1.670***	171.001*	0.231***
	(0.08)	(0.08)	(0.08)	(0.14)	(0.27)	(0.12)	(0.17)	(90.96)	(0.06)
% WASP	-0.292***	-0.304***	-0.180***	-0.096***	0.017	0.244***	0.311***	3.742	-0.048***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.05)	(0.02)	(0.02)	(13.28)	(0.01)
Density	-0.000	-0.000	0.000	-0.000***	-0.000	-0.000***	-0.000*	0.015***	0.000*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Density State	0.000***	0.000***	0.000***	0.000***	0.001***	0.000***	0.001***	0.338***	-0.000***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.11)	(0.00)
Other controls	yes	yes	yes	yes	yes	yes	yes	yes	yes
Intercept	1.116***	1.124***	0.843***	-0.656***	-0.223***	-0.055	-0.529***	256.880***	0.256***
	(0.02)	(0.02)	(0.02)	(0.05)	(0.07)	(0.05)	(0.04)	(30.21)	(0.02)
R^2 adj.	0.86	0.86	0.79	0.52	0.47	0.62	0.69	0.17	0.31
# obs.	5502	5501	5501	5463	5463	5463	5463	4830	5502

*Significance: *= p<0.10, ** = p<0.05, *** = p<0.01*

Source: See section 3; author's computations.

Table 5: IV Results, breakdown by educational attainment

	HCR all	HCR local	HCR SAEs	Street Lighting	Street Paving	Garbage Removal	Connected to Sewage	Spending pc on urbanism	Share who leave munic
Mig primary educ	-0.104	-0.170**	-0.255***	0.723***	-0.106	0.510***	-0.030	-406.066***	0.392***
	(0.07)	(0.07)	(0.07)	(0.17)	(0.26)	(0.19)	(0.16)	(99.81)	(0.05)
Mig secondary educ	-0.157	-0.305***	-0.057	0.277	-0.202	-0.084	0.245	-77.555	-0.262***
	(0.11)	(0.11)	(0.11)	(0.24)	(0.35)	(0.23)	(0.26)	(166.71)	(0.07)
Mig tertiary educ	0.087	0.269*	0.282**	-0.726**	0.715	-0.016	-0.426	278.649	-0.197**
	(0.15)	(0.14)	(0.12)	(0.30)	(0.44)	(0.25)	(0.35)	(209.64)	(0.09)
Mig Higher educ	0.543**	0.940***	0.097	-0.914*	-0.368	-0.854*	0.372	1151.801***	0.235
	(0.27)	(0.29)	(0.29)	(0.52)	(0.99)	(0.46)	(0.77)	(352.02)	(0.16)
ln (population)	-0.010***	-0.009***	-0.009***	0.085***	-0.013***	0.024***	0.034***	-30.898***	-0.014***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(1.46)	(0.00)
% men (20-35)	-0.510***	-0.568***	-0.146*	0.322	0.068	0.366**	-0.118	320.693**	0.076
	(0.09)	(0.09)	(0.09)	(0.22)	(0.28)	(0.18)	(0.17)	(139.18)	(0.07)
% women (20-35)	-0.396***	-0.424***	-0.413***	-0.543**	0.452	0.912***	-0.196	33.685	0.799***
	(0.10)	(0.10)	(0.09)	(0.22)	(0.32)	(0.22)	(0.18)	(142.55)	(0.10)
% Primary education	-0.738***	-0.743***	-0.768***	0.514***	0.381***	0.411***	0.238***	45.591	-0.018
	(0.04)	(0.04)	(0.04)	(0.09)	(0.13)	(0.07)	(0.08)	(59.76)	(0.02)
% Secondary education	-0.681***	-0.730***	-0.851***	0.537***	1.207***	0.396***	0.217***	17.717	0.178***
	(0.04)	(0.04)	(0.03)	(0.08)	(0.13)	(0.07)	(0.07)	(42.14)	(0.04)
% Higher education	-1.564***	-1.654***	-1.298***	0.552***	3.170***	0.597***	1.675***	46.526	0.241***
	(0.08)	(0.08)	(0.08)	(0.15)	(0.28)	(0.12)	(0.17)	(96.01)	(0.06)
% WASP	-0.293***	-0.304***	-0.182***	-0.094***	0.030	0.249***	0.313***	2.187	-0.045***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.05)	(0.02)	(0.02)	(13.17)	(0.01)
Density	-0.000	-0.000	0.000	-0.000***	-0.000	-0.000***	-0.000	0.015***	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Density State	0.000***	0.000**	0.000***	0.000***	0.001***	0.000***	0.001***	0.283**	-0.000***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.11)	(0.00)
Other controls	yes	yes	yes	yes	yes	yes	yes	yes	yes
Intercept	1.120***	1.138***	0.862***	-0.671***	-0.178**	-0.069	-0.534***	282.040***	0.227***
	(0.02)	(0.02)	(0.02)	(0.05)	(0.08)	(0.05)	(0.04)	(31.50)	(0.02)
R^2 adj.	0.86	0.86	0.79	0.52	0.47	0.62	0.69	0.17	0.32
# obs.	5502	5501	5501	5463	5463	5463	5463	4830	5502

*Significance: *= p<0.10, ** = p<0.05, *** = p<0.01*

Source: See section 3; author's computations.

Table 7: IV Results, breakdown by gender-age category

	HCR all	HCR local	HCR SAEs	Street Lighting	Street Paving	Garbage Removal	Connected to Sewage	Spending pc on urbanism	Share who leave munic
Mig men (20-35)	-0.863***	-0.901***	0.083	-1.807***	-1.227*	-0.404	-0.398	778.214***	-0.204
	(0.21)	(0.20)	(0.20)	(0.41)	(0.71)	(0.36)	(0.46)	(263.97)	(0.12)
Mig women (20-35)	-0.306*	-0.301*	-0.132	0.546	0.709	0.621*	-0.066	-429.688**	0.321***
	(0.17)	(0.18)	(0.16)	(0.36)	(0.56)	(0.33)	(0.41)	(180.45)	(0.10)
Mig men (other)	0.518**	0.629***	0.234	-0.361	0.311	-0.294	-0.003	67.375	-0.211*
	(0.23)	(0.22)	(0.20)	(0.42)	(0.73)	(0.38)	(0.51)	(272.28)	(0.13)
Mig women (other)	0.395**	0.320*	-0.230	1.579***	0.072	0.232	0.272	-333.842	0.030
	(0.17)	(0.17)	(0.18)	(0.42)	(0.59)	(0.34)	(0.44)	(205.72)	(0.12)
ln (population)	-0.010***	-0.009***	-0.009***	0.086***	-0.011***	0.025***	0.035***	-30.821***	-0.014***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(1.46)	(0.00)
% men (20-35)	-0.563***	-0.640***	-0.167*	0.386*	0.034	0.397**	-0.118	300.562**	0.085
	(0.09)	(0.09)	(0.09)	(0.21)	(0.28)	(0.18)	(0.17)	(142.04)	(0.07)
% women (20-35)	-0.351***	-0.381***	-0.412***	-0.438**	0.503	0.918***	-0.181	-5.965	0.792***
	(0.10)	(0.10)	(0.09)	(0.22)	(0.33)	(0.23)	(0.18)	(145.65)	(0.10)
% Primary education	-0.738***	-0.743***	-0.753***	0.452***	0.420***	0.382***	0.245***	66.791	-0.053**
	(0.04)	(0.04)	(0.04)	(0.09)	(0.13)	(0.07)	(0.08)	(56.41)	(0.02)
% Secondary education	-0.667***	-0.697***	-0.816***	0.413***	1.253***	0.350***	0.196***	74.883*	0.142***
	(0.03)	(0.04)	(0.03)	(0.07)	(0.12)	(0.06)	(0.07)	(39.99)	(0.03)
% Higher education	-1.527***	-1.568***	-1.259***	0.274*	3.192***	0.501***	1.675***	185.478**	0.237***
	(0.07)	(0.08)	(0.08)	(0.14)	(0.27)	(0.12)	(0.17)	(91.91)	(0.06)
% WASP	-0.291***	-0.302***	-0.181***	-0.089***	0.033	0.248***	0.314***	1.667	-0.046***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.05)	(0.02)	(0.02)	(13.43)	(0.01)
Density	-0.000	-0.000	-0.000	-0.000***	-0.000	-0.000***	-0.000*	0.014***	0.000*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Density State	0.000***	0.000***	0.000***	0.000***	0.001***	0.000***	0.001***	0.330***	-0.000***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.11)	(0.00)
Other controls	yes	yes	yes	yes	yes	yes	yes	yes	yes
Intercept	1.107***	1.115***	0.847***	-0.652***	-0.231***	-0.052	-0.534***	261.774***	0.245***
	(0.02)	(0.02)	(0.02)	(0.05)	(0.07)	(0.05)	(0.04)	(30.86)	(0.02)
R^2 adj.	0.86	0.86	0.79	0.52	0.47	0.62	0.69	0.17	0.32
# obs.	5502	5501	5501	5463	5463	5463	5463	4830	5502

*Significance: *= p<0.10, ** = p<0.05, *** = p<0.01*

Source: See section 3; author's computations.

Table 8: IV Results, breakdown by years since migration

	HCR all	HCR local	HCR SAEs	Street Lighting	Street Paving	Garbage Removal	Connected to Sewage	Spending pc on urbanism	Share who leave munic
Mig <1 year	-0.389***	-0.471***	-0.327***	0.593***	0.103	0.495***	0.035	-181.123*	0.058
	(0.08)	(0.08)	(0.07)	(0.17)	(0.25)	(0.14)	(0.18)	(94.70)	(0.05)
Mig 1-2 years	-0.081	-0.016	0.064	0.027	0.290	0.201	0.220	-63.321	0.087
	(0.09)	(0.08)	(0.08)	(0.18)	(0.26)	(0.15)	(0.19)	(130.20)	(0.05)
Mig 2-3 years	-0.033	0.012	0.109	-0.422*	-0.268	0.281	0.191	183.162	-0.112
	(0.10)	(0.11)	(0.11)	(0.25)	(0.34)	(0.20)	(0.25)	(159.19)	(0.07)
Mig 3-4 years	0.027	-0.028	-0.014	-0.114	-0.434	-0.505**	-0.317	-21.876	-0.023
	(0.12)	(0.12)	(0.12)	(0.28)	(0.37)	(0.23)	(0.27)	(163.89)	(0.08)
Mig 4-5 years	0.327***	0.309***	0.009	0.288	0.405	-0.189	-0.289	-7.576	-0.013
	(0.11)	(0.11)	(0.11)	(0.25)	(0.35)	(0.21)	(0.27)	(156.59)	(0.07)
ln (population)	-0.011***	-0.009***	-0.009***	0.084***	-0.011***	0.026***	0.035***	-30.318***	-0.014***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(1.46)	(0.00)
% men (20-35)	-0.542***	-0.615***	-0.170*	0.434**	0.066	0.414**	-0.094	281.550**	0.084
	(0.09)	(0.09)	(0.09)	(0.22)	(0.29)	(0.18)	(0.17)	(140.48)	(0.07)
% women (20-35)	-0.385***	-0.421***	-0.401***	-0.570**	0.392	0.867***	-0.215	46.175	0.777***
	(0.10)	(0.10)	(0.09)	(0.23)	(0.32)	(0.22)	(0.18)	(146.97)	(0.10)
% Primary education	-0.737***	-0.741***	-0.748***	0.450***	0.391***	0.372***	0.243***	73.132	-0.057**
	(0.04)	(0.04)	(0.04)	(0.09)	(0.13)	(0.07)	(0.08)	(56.93)	(0.02)
% Secondary education	-0.653***	-0.679***	-0.804***	0.403***	1.268***	0.337***	0.200***	77.655*	0.142***
	(0.03)	(0.04)	(0.03)	(0.07)	(0.12)	(0.07)	(0.07)	(41.05)	(0.03)
% Higher education	-1.514***	-1.560***	-1.271***	0.355**	3.158***	0.512***	1.683***	169.924*	0.236***
	(0.08)	(0.08)	(0.08)	(0.14)	(0.28)	(0.12)	(0.17)	(91.08)	(0.06)
% WASP	-0.293***	-0.304***	-0.182***	-0.087***	0.030	0.249***	0.313***	2.773	-0.046***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.05)	(0.02)	(0.02)	(13.29)	(0.01)
Density	-0.000	-0.000	-0.000	-0.000***	-0.000	-0.000***	-0.000*	0.015***	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Density State	0.000***	0.000***	0.000***	0.000***	0.001***	0.000***	0.001***	0.320***	-0.000***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.11)	(0.00)
Other controls	yes	yes	yes	yes	yes	yes	yes	yes	yes
Intercept	1.123***	1.129***	0.842***	-0.607***	-0.206***	-0.050	-0.536***	244.008***	0.253***
	(0.02)	(0.02)	(0.02)	(0.05)	(0.07)	(0.05)	(0.04)	(30.59)	(0.02)
R^2 adj.	0.86	0.86	0.79	0.51	0.47	0.62	0.69	0.16	0.31
# obs.	5502	5501	5501	5463	5463	5463	5463	4830	5502

*Significance: *= p<0.10, ** = p<0.05, *** = p<0.01*

Source: See section 3; author's computations.

Table 9: IV Results, polarization

	sanitation			
lr	water	toilet	sewage	garbage
immigration	-0.576	-0.102	-0.035	0.413***
rate	(0.46)	(0.06)	(0.16)	(0.14)
Controls	yes	yes	yes	yes
R^2 adjusted	0.13	0.11	0.15	0.09
# obs.	4857	4857	4857	4857

Source: See section 3; author's computations.