Development and the Educational Composition of International Migrants across Cities

Abstract

This paper presents how the educational composition of international immigrants to cities varies with local development. The study quantifies and structures international immigration inflows by education level as a function of local development, comparing cities of different sizes. We employ a multivariate model to examine how the educational composition of international immigrants varies with the Human Development Index (HDI) of destination cities, proxied by a composite measure of health, education, and household amenities derived from census data. City-level immigration data by educational attainment were compiled from harmonized census microdata and linked to Functional Urban Areas (FUAs). The dataset covers 311 cities in 13 countries and 29 censuses across five decades With rising development, cities attract an increasingly educated immigrant population with higher shares of secondary and university degrees, and fewer with little schooling. This shift is steeper and more orderly in large and secondary cities. This work contributes to monitoring how human capital mobility reshapes the educational composition of urban populations at different stages of development.

Background

Existing studies on human capital mobility have predominantly focused on highly skilled migrants or present a dichotomy, university-educated versus non-university educated (Akbaritabar et al., 2025; Czaika & Parsons, 2016; Docquier & Rapoport, 2009; Ewers & Dicce, 2018; Sanliturk et al., 2023) offering limited insights into the educational composition in destinations. Only a few studies have provided empirical assessments of the skill composition of international immigration (Artuç et al., 2014; Docquier & Marfouk, 2006; Huang et al., 2025), and evidence focusing on cities as primary hubs of international migration remains particularly scarce. Some research has examined high-skilled migration to specific urban contexts (Beaverstock, 2011; Buch et al., 2017; Labrianidis et al., 2022) but systematic analyses that include migrants across all education levels are still lacking.

Leaving one's country behind and making the decision to migrate is shaped by a complex set of drivers (Castelli, 2018; Hugo, 2016; Van Hear et al., 2018), including the relative level of development in destination countries and cities. Prior research suggest that higher levels of development are associated with increased immigration (Clemens, 2014; De Haas, 2010), a pattern also hypothesized for internal migration to cities (Zelinsky, 1971, 1978). Development can be measured in many ways, but census data make it possible to operationalize development through an adaptation of the United Nations Human Development Index (HDI) (United Nations, 2022), shifting focus from purely economic measures to also considering health and education progress and individuals capabilities (Sen, 1999). The impact of developmental progress on migration to cities across different educational groups remains relatively unexplored, and it is therefore unclear how varying levels of development shape the educational composition of immigration.

To address this gap, this research analyzes the educational composition of immigration flows into cities, using a comparative framework that spans multiple countries, time periods and urban contexts. Cities play a central role in shaping migration selectivity (Kanbur & Rapoport, 2005), as they concentrate economic opportunities, services, and amenities that attract migrants with diverse educational backgrounds. Unlike national-level immigration distributions, city-level inflows vary according to the functional role and development of each urban area, reflecting differences in labor markets, infrastructures and accessibility of services (Sassen, 2001). This study provides a comparative perspective on how international migration reshapes the educational structure of cities along the development gradient.

Data

To estimate the relationship between local development and immigration into cities by educational composition, we exploit census data based on samples provided by IPUMS International (Minnesota Population Center, 2019) in combination with geospatial data of Functional Urban Areas (OECD & European Commission, 2020). Thus, we receive the number of people immigrating by educational attainment level for individual cities within 13 countries. The education attainment variable is structured into four categories, less than primary education, completed primary, completed secondary and completed university education. Within the census, a household member reports the current and previous residence (typically five or one year prior to enumeration), which enables us to identify recent immigrants in their destination cities. In our sample we have 311 cities across 29 censuses in 13 countries (Figure 1) spanning 5 decades and different development stages.

We restrict the analysis to individuals aged 25 to 64 to ensure that education has been completed and to focus on the economically active population. Local development is measured through a composite Human Development Index (HDI) at the FUA level, following the capabilities framework and adapting UNDP methodology for small-area census data—as recommended by (Permanyer, 2013; Permanyer et al., 2015). The health dimension is estimated using Brass' method (Brass, 1975) for child survival rates; the education dimension averages completion rates for primary (ages 15–19), secondary (20–24), and tertiary (25–29) schooling; and living standards are derived from a household wealth index based on durable goods and service access. To avoid unreliable income data in small areas (Harttgen & Klasen, 2012) we instead calculate the proportion of available household amenities per FUA. Each component is normalized within country-periods, and their average yields a composite HDI consistent with the pre-2010 UNDP framework.

We fit a series of Bayesian multilevel categorical (multinomial) regression models using the brms package (Bürkner, 2017) to examine how the relative levels of immigration by education to cities changes with HDI. The response variable is the share of immigrants by their education attainment. We control for the destination city population size for the overall model and introduce destination city and country random effects to control for characteristics that stay constant over time such as locational advantages related to connectivity within the international and national transport network, proximity to ports, or coastal access to capture remaining city- and country-specific effects.

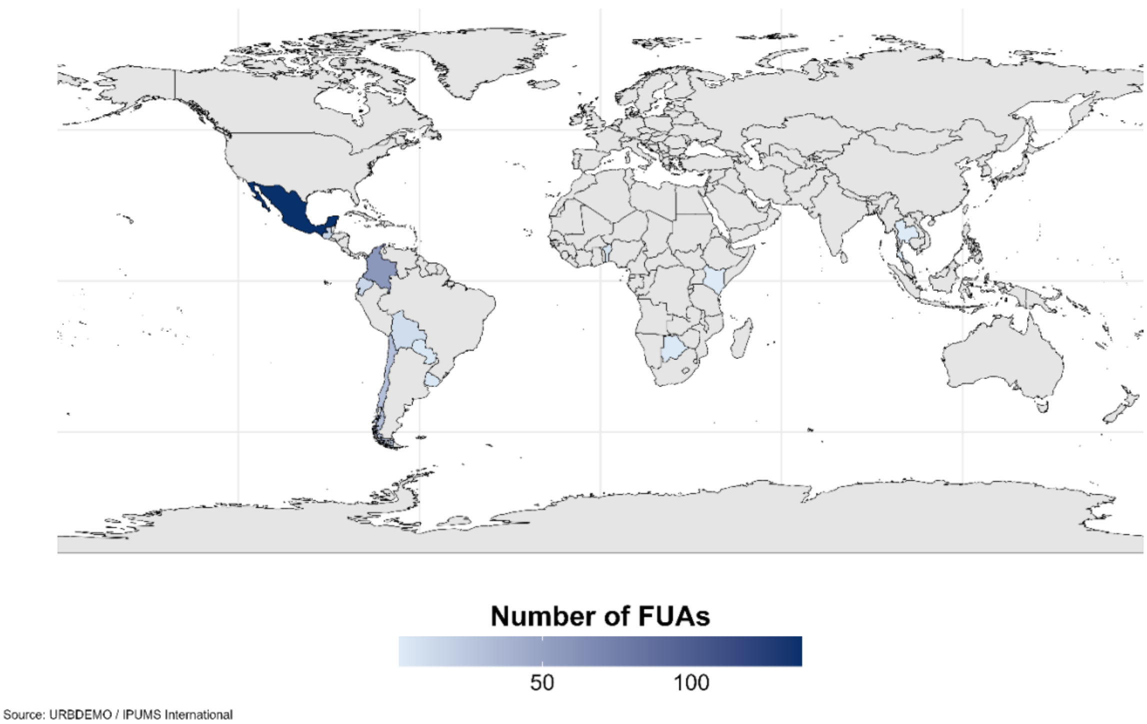

Figure 1: Geographic Distribution and Number of Functional Urban Areas (FUAs) included in the Study based on available census rounds.
Source: URBDEMO & GHSL

Preliminary Results

Figure 2 displays the share of international immigrants by education level across all 311 cities, plotted against the Human Development Index (HDI) of the destination. Each point represents one city, and smoothed LOESS curves trace the relationship between city-level development and the educational composition of immigrant inflows.

Across the observed HDI range, the share of immigrants with less than primary education tends to decrease with higher HDI, although with wide variation at low local development. Those with primary education follow an inverted-U pattern, peaking in mid local development before declining. Secondary completed immigrants display relatively stable shares across development levels, while university-educated immigrants remain a minority in most cities but show a modest upward trend at higher local development. This suggests a gradual educational upgrading of immigrant inflows as local development advances.

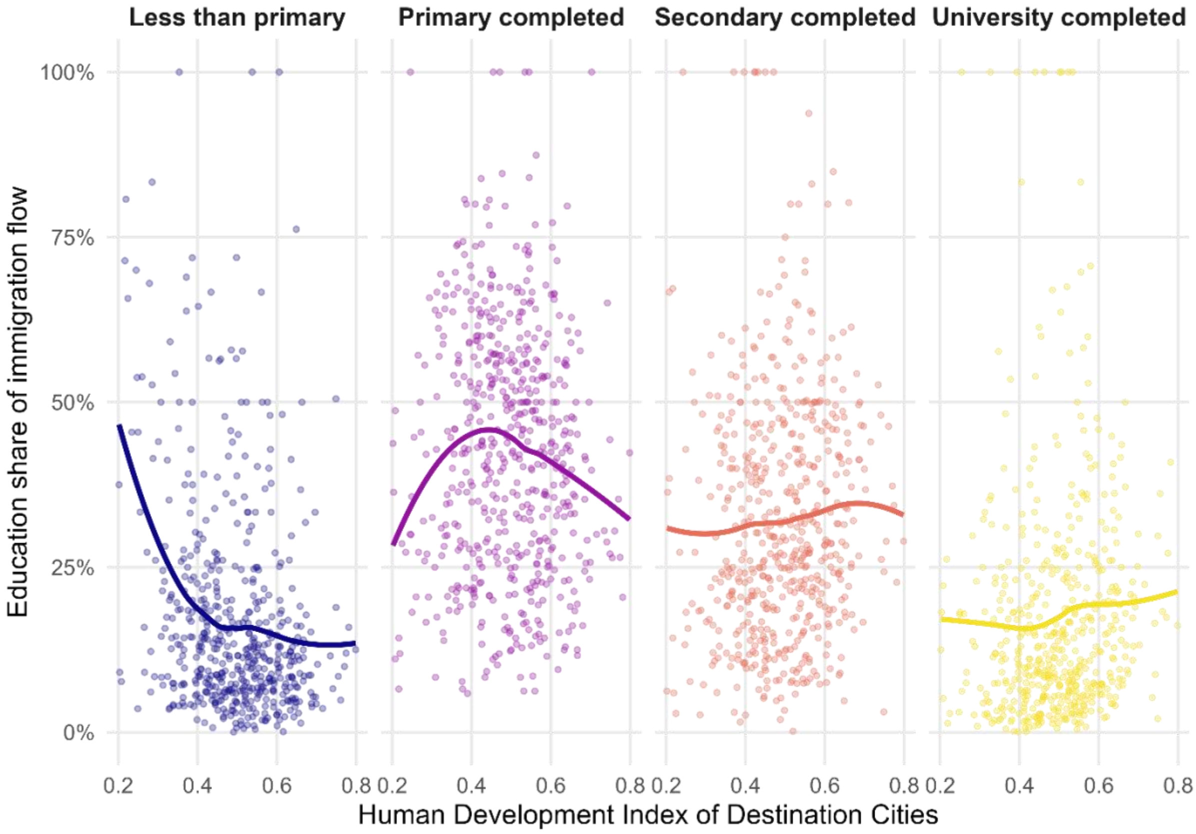

Figure 2: Descriptive Trend of the Relationship between City-Level Human Development (HDI) and the Share of Educational Composition of International Immigrants
Source: URBDEMO/IPUMS International

Figure 3 depicts the model-based predicted educational composition of immigrants for an average city as local development increases. The share of immigrants with less than primary education declines slightly at lower HDI levels but rises again marginally as local HDI increases. Migrants with primary and secondary education dominate inflows across much of the development spectrum, while the shares of secondary- and especially university-educated immigrants increase in higher local HDI contexts. University-educated remain a minority overall. Together, these predictions suggest that as local development advances, immigrant inflows become progressively more selective toward higher educational attainment in cities.

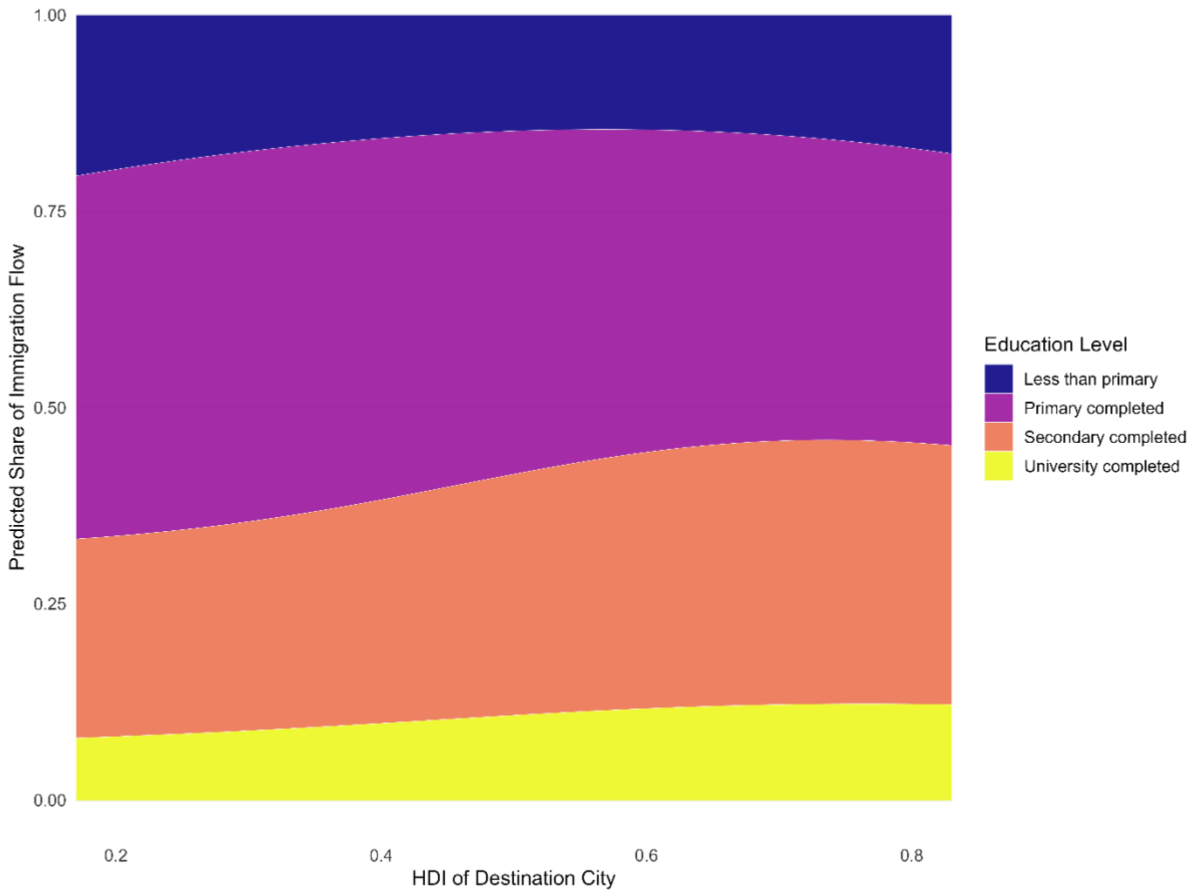

Figure 3: Model-Predicted Educational Composition of International Immigrants across the City-Level Human Development Spectrum
Source: URBDEMO/IPUMS International

Figure 4 displays model-predicted trends in the educational composition of international immigrants by city size. Across all levels of the urban hierarchy, the share of immigrants with less than primary education declines with development, while the proportion of university-educated migrants rises modestly. The upgrading of immigrant educational composition is most consistent in the largest and secondary cities, where increases in local development are accompanied by gradual rises in secondary- and tertiary-educated migrant shares. In intermediate and smaller cities, the relationship between development and education is more irregular, with less pronounced or fluctuating trends across HDI levels, calling for further investigation. Overall, these results suggest that larger cities attract increasingly educated immigrant populations, while smaller cities display weaker or more variable selectivity patterns. Over time, such dynamics may amplify inter-urban inequalities with large metropolitan areas consolidating their role as centers of knowledge production and exchange, while limiting similar opportunities in smaller urban contexts.

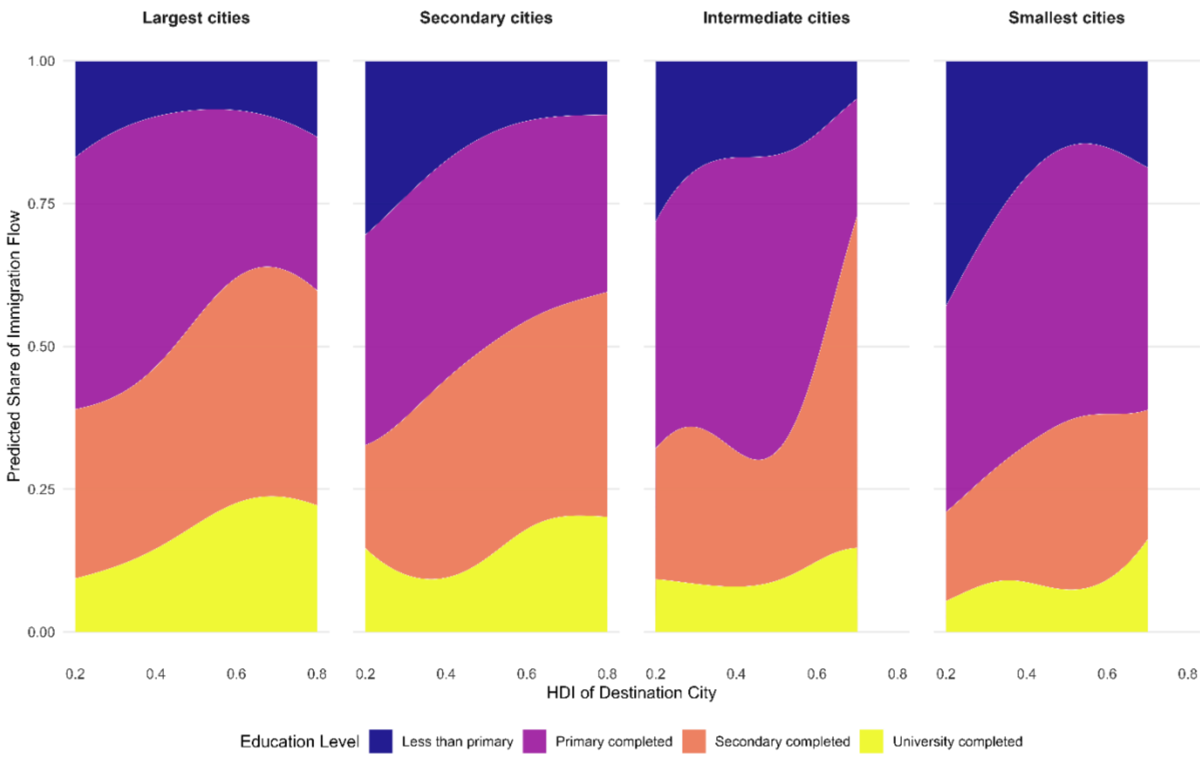

Figure 4: Model-Predicted Educational Composition of International Immigrants across the City-Level Human Development Spectrum
Source: URBDEMO/IPUMS International

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