

Proposal for a communication at the European Population Conference 2020, 24-27 June,
Padova (IT)

International Migration and City Growth in the Global South

Mathias Lerch
Max Planck Institute for Demographic Research
email: lerch@demogr.mpg.de

Abstract

Urbanization in the global South carries a number of risks and opportunities for human development, which may also increase international migration. Yet the evidence about the sources of urban growth is scarce, especially on migration and at the city level. We offer comparative estimates, and associated confidence intervals, of international migration in cities of the global South and investigate the interactions with other growth components across seven countries and their urban hierarchies. Combining individual-level census data and geographic master-files with indirect techniques of demographic estimation, we cover 377 consistently defined metropolitan areas. Cities pioneered the transformations of their countries' international migration regime. In almost one third of cities, the population change and replacement was mainly determined by migration. The international component of migration was larger than the domestic one in more than half of cities. Whereas internal migration tends to decrease with rising city size, the balance in international movements tends to increase. Positive net international migration substitutes for the net losses from domestic movements in large cities, but complements the gains in intermediary cities.

Introduction

The urban transition from a mainly rural to a predominantly urban society constitutes among the most important transformations in contemporary population geography. In 2015, 49% of the population in developing countries was living in urban areas (up from 35% in 1990), and the future world population growth is expected to be concentrated there (United Nations 2018). This urbanization carries a number of risks and opportunities for human development, which are also likely to increase international migration. Yet the demographic changes that underlie urban growth remain poorly documented, especially at the city level where planning can be most effectively implemented. We aim at filling this gap and focus on the underappreciated role of international migration.

Repeated assessments of the demographic components of urban growth since 1960 in developing countries have suggested a dominant role for the excess number of births over the deaths (e.g. natural increase), rather than for rural-to-urban migrations (Chen et al. 1998, United Nations 1980, Jedwab et al. 2017, Jiang and O'Neill 2018). However, in very low urban fertility contexts of China and South-East Asia, recent urban growth was mainly driven by net rural-to-urban movements (Hugo 2014, Zheng and Yang 2016). Moreover, in highly urbanized countries, the excessive agglomeration of human activity creates industrial, social and environmental diseconomies. These problems particularly concern cities at the top of the settlement distribution according to size, political and economic functions – hereafter also referred to as the urban hierarchy. Therefore, economic activities are shifted to lower-ranked settlements, leading to rising inter-city migration from primate cities towards the fast growing intermediary and smaller cities – as currently observed in Latin America (Rodríguez-Vignoli 2017) and Asia (Jones 2006, Firman 2016). What is more, the overall intensity of internal migration is declining across the world since the 1980s (Bell et al. 2018).

While developing countries will soon complete the fertility transition, and the role of internal migration (hereafter also referred to as out-/in-migration) is diversifying and potentially declining in city growth, we know almost nothing about international movements (referred to as e-/immigration). International migration has concerned a growing number of developing countries since 1960 (Czaika and de Haas 2014, Özden and Parsons 2015, Abel and Sander 2014). Yet the evidence about the subnational origins and destinations of these flows is almost completely non-existing in the global South.

Cities are likely to play a key role in the international migration phenomenon (Skeldon 2018). They are attractive destinations because of the more diversified labor markets, when compared to rural areas, and their role as engines of national economic and social development (World Bank 2009). Cities compete with one another for students and workers on a national *and* global scale. These pull factors of migration are particularly marked in global cities that function as command centers of the international economy (Sassen 2001). Cities thus constitute national gateways for immigrants because they concentrate networks of previous migrants who assist new candidates in their resettlement process. The importance of international migration for demographic growth is confirmed in samples of large cities and national capitals around the world – not only in Western countries, but also in Eastern and South-Eastern Asia (Hugo 2014,

Plane et al. 2005, Strozza et al. 2015, Lerch 2017). However, we lack evidence for a truly international sample of cities that includes also intermediary and small settlements, where the majority of the world's urban population is concentrated (United Nations 2018).

Cities may be major sending areas of international migrants, too. The capabilities to move abroad are often acquired in urban environments because they concentrate the higher education infrastructure. When compared to lower skilled workers, the more educated face lower barriers to mobility (in terms of costs, language proficiency, etc.), have a more global labor market, and increased aspirations and awareness for better political and economic opportunities abroad (DeHaas 2010). Cities also act as national career escalator regions (Fielding 1993), in which workers gain experience in modern labor markets and develop work attitudes that enable them to find interesting jobs in other countries. As the major nodes in transport and communication networks, cities also tend to channel the rural exodus towards foreign destinations (Fussel 2004, Lerch 2016). In addition to these enabling factors of migration, push factors may also be significant in cities, especially in small settlements where poverty is more prevalent when compared to larger cities (Brockerhoff and Brennan 1998, Ferré et al. 2010).

We provide the most consistent assessment of the role of international migration and its interaction with internal migration and natural increase in the recent population growth of 377 metropolitan areas located in seven countries that span all developing regions. The selected countries cover different stages of the urban and demographic transition, and are characterized by contrasting histories of international migration: Benin, Morocco, Indonesia, The Philippines, Chile, Brazil and Mexico. We have three main working hypotheses. Firstly, we expect cities to lead the progress in their country's mobility transition (with negative international migration in early stages, but positive net flows in later stages). Secondly, we hypothesize that international migration contributes to city-growth to a larger extent than internal migration (and natural increase) in later, when compared to earlier, stages of the urban (and demographic) transition because of the exhausted domestic rural reservoir of potential internal migrants (and the cities leading role in the secular fertility decline). Thirdly, we expect international migration to be positive and more sustained in upper levels of the urban hierarchy, which are socially and economically more attractive. As the push and enabling factors of migration may out-weight in intermediate and small cities, they are expected to lose populations to other countries.

Methodology

We combine indirect demographic estimation techniques with the use of individual-level census data and geographic masterfiles of metropolitan areas to estimate the natural increase and internal and international migration component of city growth. As we have concerns about the quality of the census samples, we applied two complementary approaches and quantify the uncertainty in the indirect estimates of international migration and birth rates.

Data and definitions

We assembled Integrated Public Use Micro-Samples (IPUMS) of national population censuses fielded since 1990, which include information on the place of residence at the time of

enumeration and five years earlier, disaggregated by municipality or any other lower subnational administrative level (Minnesota Population Center 2017). These individual-level data enable us to aggregate individuals into meaningful and consistently defined cities in order to estimate: weighted population counts and intercensal growth, as well as out- and in-migration flows (for the last quinquennium of the intercensal interval; due to data limitations, we have to assume that this rate remained constant over the whole interval). International migration and natural increase between two censuses are indirectly estimated (see further down). Deaths are implied by applying the United Nations' age- and sex-specific mortality rates to the IPUMS population at risk.

In order to appropriately delimit the city areas, we used administrative names to match the IPUMS data to the lists of municipalities constituting the *metropolitan areas* of cities according to www.citypopulation.de. These areas have been defined based on geo-spatial census data on the continuity of the built environment and include the recently urbanized (but officially rural) areas in the cities' vicinities. We define the boundaries of metropolitan areas at the *end* of the observation periods and apply this spatial definition to population data in earlier years. This is made possible thanks to the IPUMS's spatial harmonization of subnational administrative units across census rounds. In other words, we eliminate the reclassification component of city growth (which is due to urban sprawl) by including the population in the recently urbanized (but officially) rural areas in the cities vicinities. This enables us to focus on internal *and* international migration within constant spatial extents of cities.

Our sample of 377 cities includes: 5 cities in Benin observed in the period 2002-13, 128 Brazilian cities in 2000-10, 26 cities in Chile in 1992-2002, 59 Indonesian cities in 2000-10, 59 Mexican cities in 2000-10, 6 Moroccan cities in 1994-2004 and 94 cities in the Philippines in 2000-10.

Estimation method

In the first approach, we estimated the components of demographic change at the aggregate population level. The rates of intercensal population change, deaths and in- and out-migrations are directly estimated based on the weighted IPUMS (and UN) data. Intercensal crude birth rates were obtained indirectly by reverse-survival of the weighted numbers of children aged less than 10 years at the second census (Moultrie et al. 2013). In a second step, we obtained the number of net international migrations as the *residual* of the demographic balancing equation at the aggregate population level (see Appendix for more detail).

As censuses more frequently undercount children than older populations (implying biased birth rates and, thus, also international migration residuals), we also applied an alternative estimation approach, in which we turn things up-side down. The number of net international migrations is obtained as a first residual of the age-specific version of the demographic balancing equation (see Appendix; Hill 1987, Hill and Wong 2005). The crude birth rate is then obtained in a second step as the residual of the balancing equation at the aggregate population level. The two sets of residual estimates still do not capture all the uncertainty regarding data quality (i.e. differential enumeration completeness or quality in the IPUMS sampling). To quantify this uncertainty, we provide lower and higher confidence intervals of our point estimates by replicating the procedures outlined above after adjustment of the population

counts at the second census for a hypothetical rate of differential under- and over-enumeration/sampling of three percent, respectively. We also mapped the internal and international migration patterns to evaluate the plausibility of our results and better understand the spatial context of the interactions between the two flows.

Results

International migration and its interaction with internal movements in cities

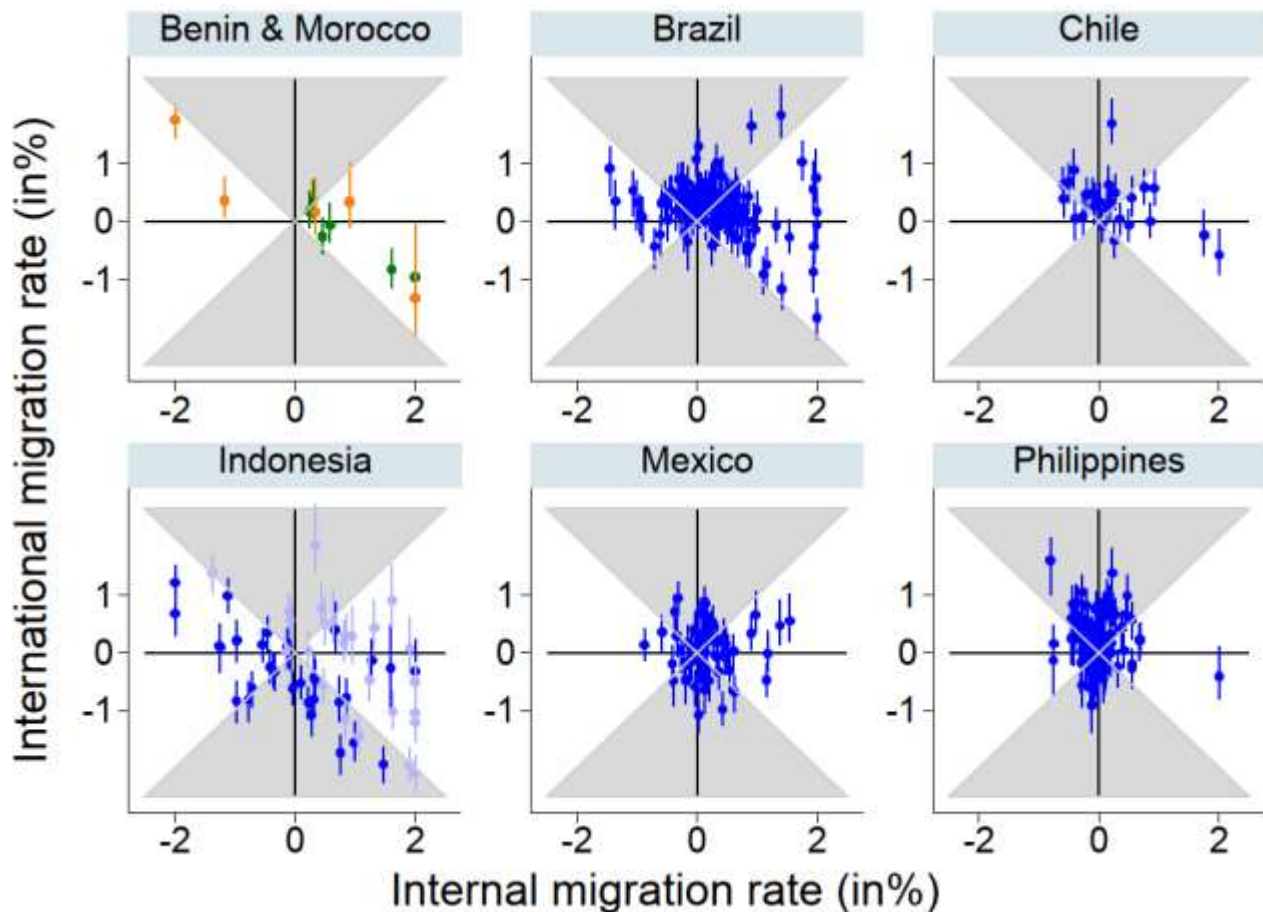
To appreciate the interactions between internal and international migration in the process of city growth, we plotted in Figure 1 all cities according to the annual rate of net internal migration (on the x-axis) and the rate of net international migration (on the y-axis) by country. The metropolitan populations situated in the upper gray-shaded triangle experienced a positive net international migration, which was larger than the absolute value of the balance of internal movements. In cities situated in the lower gray-shaded triangle, net international migration also affected city growth to a larger extent than internal migration, but the rate is negative. Outside of these gray-shaded areas, the internal movements had a major demographic impact.

In the least urbanized countries of the sample, Benin and Morocco, the internal component by far dominated total net migration in all eleven cities, but one (Morocco's inland city Marrakech). In the major emigrant sending country Morocco, all cities located at the border of the Atlantic Ocean experienced net emigration.

In Indonesia (a mid-urbanized country), the demographic importance of the international component dominated the migration exchanges in almost two fifth of the cities (i.e. the absolute level of international migration exceeds that of internal movements). More than half of the cities (54%) experienced net emigration. Cities thus play a pioneering role in the significant increase in more permanent international departures from Indonesia since 2000. These losses generally annihilated the cities' gains from in-migration (in 41% of cities). In the other 45% of cities, positive international migration either complemented the positive balance of internal movements, or substituted for the net losses.

The Philippines (another mid-urbanized country) stands out with the largest share of cities (71%) in which international migration had a stronger demographic impact when compared to that attributable to internal movements. More than three quarters of cities experienced net immigration. This contrasts with the country's history of sustained emigration and indicates the cities' leading role in the emerging migration turnaround. Manila's metropolitan area and satellite cities were the main recipients. Net immigration compensated for the internal migration losses in 41% of cities, but complemented the domestic gains in almost one third (especially in the main urban centers).

Figure 1: Annual rates of net internal and international migration by city, 377 metropolitan areas in seven developing countries, 1992-2013.



Sources: own estimates based on www.citypopulation.de & IPUMS-International.

Notes: estimates for intercensal periods are shown; green = Morocco, orange = Benin, light blue = Indonesian cities defined by geographic areas that are not necessarily consistent over census rounds; the vertical lines that cross the dots refer to the confidence intervals of net international migration.

In Brazil and Chile (two highly urbanized countries), the demographic relevance of net international migration was more important than that of internal migration in 44% of Brazilian and 58% of Chilean cities. The majority of cities (at least three quarters) had a positive international balance, while net internal migration varied substantially. In at least 42% of cities, international migration was complementary to the gains from in-migration. In the second major group of cities (at least 30%), international migration replaced internal population losses. The average net international migration of cities was significantly above the (almost) neutral balance observed at the national level in both countries.

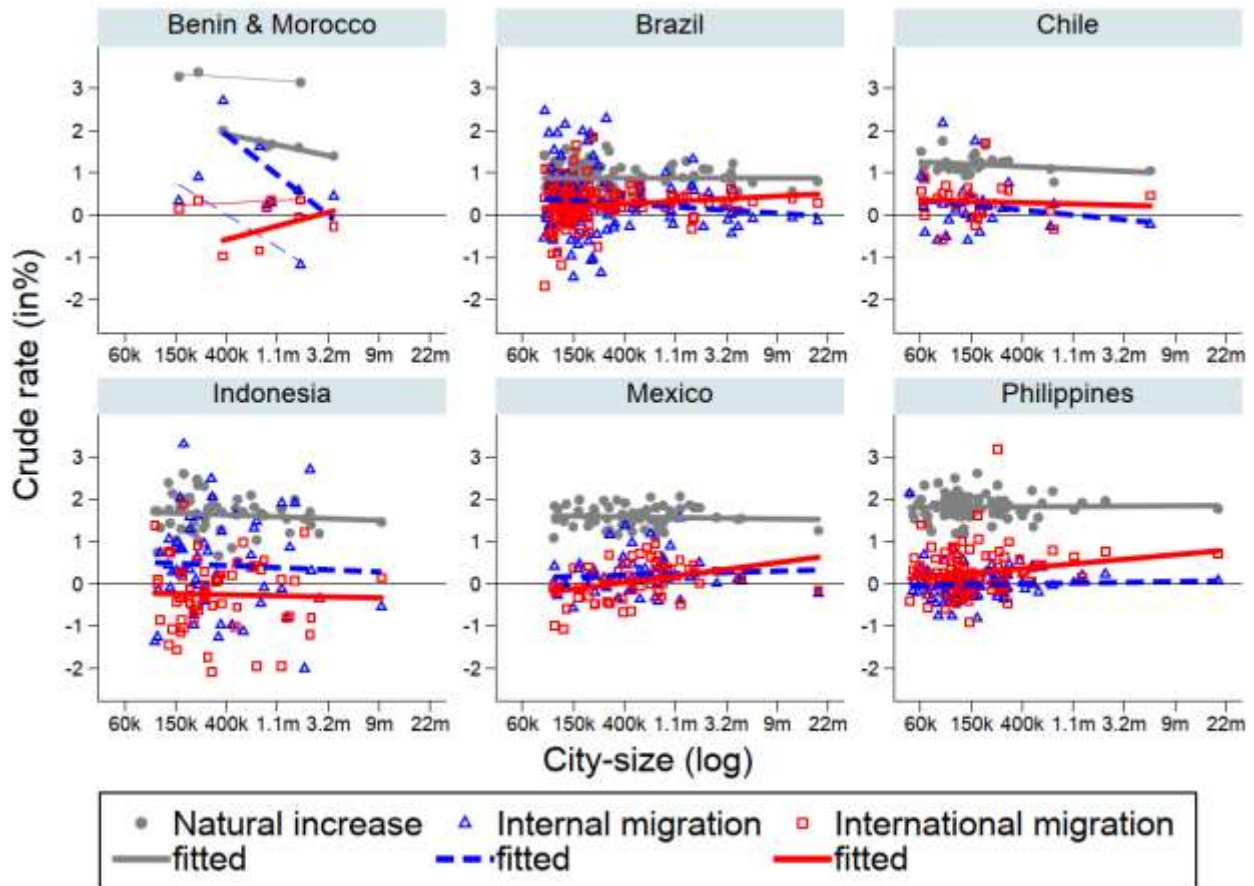
In Mexico (another highly urbanized country), the majority of metropolitan populations (59%) were affected by international movements to a larger extent than by internal ones, but the sign

of the international balance differed significantly. More than three fifth of the cities experienced net immigration. In 47% of cities, this positive net external migration complemented the net in-migration. International migration losses annihilate the gains from net in-migration in 25% of all cities.

The growth contribution of international migration across the urban hierarchy

After having established the importance of international migration, relative internal movements, for cities, we are now able to estimate the full demographic impact of population mobility, which is conjectured to rise as countries progress in their demographic transition. However, the demographic importance of migration and its sources (internal vs. international) likely vary across the urban hierarchy due the cities' leading role in the national fertility transition and the socioeconomic congestion effects that motivate outmigration from large settlements. In Figure 2, we plotted all city estimates and the linear regression line for each components of population change (on the y-axis) according to logged metropolitan population size (as a proxy for the urban hierarchy; on the x-axis) by country.

Figure 2: Annual rates of natural increase, net internal and international migration according to city-size, 377 metropolitan areas in 7 developing regions, 1992-2013.



Sources: own estimates based on www.citypopulation.de & IPUMS-international
 Notes: estimates for intercensal periods are shown; k = thousand, m = million; in the panel for

Benin & Morocco, the fine lines refer to Benin while the thicker ones pertain to Morocco; confidence intervals are not shown to increase lisibility of the graph.

The relative importance and demographic impact of the sources of city growth systematically differ over the city-size distribution. The level of internal migration tends to be more important in smaller than in larger cities – especially in Africa (Benin and Morocco), Brazil, Chile and, to a lesser extent, in Indonesia. This can be explained by the expansion of the population base (i.e. in-migrants make up a smaller share) over time and the out-migration from large cities to smaller settlements with better social and environmental amenities. In Africa, a negative association with city-size also holds for the level of natural increase.

The balance of international migration, by contrast, tends to increase with rising city-size in Brazil, Mexico, Morocco, and the Philippines. While small cities experience low and often negative rates of net international migration, large cities benefit the most from immigration. This positive association is weak to moderate (with correlation coefficients situated between 0.14 to 0.44, depending on the country), and statistically significant only in the Philippines and Mexico. Nevertheless, cities with more than 500 thousands inhabitants seldom experience a negative international migration balance.

Therefore, the frequent net out-migration in larger cities (as defined by a population of at least one or three million) tends to be compensated by net immigration. Both components of migration are generally positive and sustain population growth in intermediary cities (with 500 thousand to 3 million inhabitants). In small cities net in-migration was often annihilated by net emigration, although the growth patterns are very heterogeneous at the bottom of the urban hierarchy.

Preliminary Discussion

Cities tend to experience higher (and more often positive) levels of net international migration when compared to the total population in their country. More than two thirds of all cities experienced a positive balance. The results confirm a rising rate of international migration and its growing relative importance in the cities' migratory exchanges as their countries advance in the process of urban transition and human development (with Benin at the bottom and Chile and Brazil at the top of the distribution). However, this association is confounded by the pioneering role of cities in the emerging transformations of national migration regimes: the recent rise in permanent emigration from Indonesia and the emerging migration turnaround from historically negative to positive levels in the Philippines, Mexico and, to a lesser extent Morocco. The level of net international migration and its role in the process of demographic change also tends to increase with city size. Positive net international migration substitutes for the net losses from domestic movements in large cities, but complements the gains in intermediary cities.

In the full version of this communication, we will expand the discussion and also analyze the country maps of the interactions between internal and international migration in cities. This will

prove the plausibility of our indirect estimates, as the spatial patterns are congruent to our knowledge of the regional geography of migration and development in each country.

References

- Abel, Guy J., and Nikola Sander. 2014. "Quantifying Global International Migration Flows." *Science* 343.
- Bell, Martin, Elin Charles-Edwards, Aude Bernard, and Philipp Ueffing. 2018. "Global Trends in Internal Migration." In *Internal Migration in the Developed World*, edited by Tony Champion, Thomas Cooke and Ian Shuttleworth. Oxon & New York: Routledge.
- Brockhoff, Martin, and Ellen Brennan. 1998. "The Poverty of Cities in Developing Regions." *Population and Development Review* 24 (1):75-114.
- Chen, Nancy, Paolo Valente, and Hania Zlontnik. 1998. "What Do We Know about Recent Trends in Urbanization?" In *Migration, urbanization, and development: new directions and issues*, edited by Richard E. Bilsborrow, 59-88. Norwell: Kluwer Academic Publishers.
- Czaika, Mathias, and Hein de Haas. 2014. "The Globalization of Migration: Has the World Become More Migratory?" *International Migration Review* 48 (2):283-323.
- DeHaas, Hein. 2010. "Migration and Development: A Theoretical Perspective." *International Migration Review* 44 (1):227-264.
- Ferré, Céline, Francisco H.G. Ferreira, and Peter Lanjouw. 2010. "Is There a Metropolitan Bias? The Inverse Relationship between Poverty and City Size in Selected Developing Countries." *The World Bank Policy Research Working Paper Series* 5508.
- Fielding, Tony. 1993. "Migration and the Metropolis: An Empirical and Theoretical Analysis of Inter-regional Migration to and from South East England." *Progress in Planning* 39:71-166.
- Firman, Tommy. 2016. "Demographic Patterns of Indonesia's Urbanization, 2000-2010: Continuity and Change at the Macro Level." In *Contemporary Demographic Transformations in China, India and Indonesia*, edited by Christophe Z. Guilmoto and Gavin W. Jone, 255-269. Cham Heidelberg New York Dordrecht London: Springer International Publishing Switzerland.
- Fussel, Elizabeth. 2004. "Sources of Mexico's Migration Stream: Rural, Urban, and Border Migrants to the United States." *Social Forces* 82 (3):937-967.
- Hill, Kenneth. 1987. "New Approaches to the Estimation of Migration Flows from Census and Administrative Data." *International Migration Review* 21 (4):1279-1303.
- Hill, Kenneth, and Rebeca Wong. 2005. "Mexico: US Migration: Views from Both Sides of the Border." *Population and Development Review* 31 (1):1-18.
- Hugo, Graeme. 2014. *Urban Migration Trends, Challenges, Responses and Policy in the Asia-Pacific, Background paper for the World Migration Report 2015*. Geneva: International Organization for Migration (IOM).
- Jedwab, Remi, Luc Christiaensen, and Marina Gindelsky. 2017. "Demography, urbanization and development: Rural push, urban pull and... urban push?" *Journal of Urban Economics* 98 (2017):6-16.
- Jiang, Leiwen, and Brian O'Neill. 2018. "Determinants of Urban Growth during Demographic and Mobility Transitions: Evidence from India, Mexico, and the US." *Population and Development Review* 44 (2):363-389.
- Jones, Gavin W. 2006. "Urbanisation in Southeast Asia." In *Challenging Sustainability - Urban Development and Change in Southeast Asia*, edited by Tai-chee Wong, Brian J. Shaw and Kim-chuan Goh, 247-267. London: Marshall Cavendish International (Singapore) Private Limited.
- Lerch, Mathias. 2016. "Internal and International Migration across the Urban Hierarchy in Albania." *Population Research and Policy Review* 36 (6):851-876.

- Lerch, Mathias. 2017. "International migration and city growth." *United Nations Population Division Technical Paper* 2017-10.
- Minnesota Population Center. 2017. *Integrated Public Use Microdata Series, International: Version 6.5 [dataset]*. Minneapolis: University of Minnesota.
- Moultrie, Tom A., Rob Dorrington, Allan Hill, Kenneth Hill, Ian Timaeus, and Basia Zaba. 2013. *Tools for Demographic Estimation*. Paris: International Union for the Scientific Study of Population (IUSSP).
- Özden, Çağlar, and Christopher R. Parsons. 2015. "On the Economic Geography of International Migration." *The World Economy* 39 (4):478–495
- Plane, David A., C. J. Henrie, and M. J. Perry. 2005. "Migration up and down the urban hierarchy and across the life course." *Proceedings of the National Academy of Sciences* 102 (43):15313-15318.
- Rodríguez-Vignoli, Jorge. 2017. "Cities and migration in Latin America and the Caribbean: updated estimates of key socio-demographic effects." *United Nations Expert Group Meeting on Sustainable Cities, Human Mobility and International Migration* UN/POP/EGM/2017/1:30.
- Sassen, Saskia. 2001. "Cities in the Global Economy." In *Handbook of Urban Studies*, edited by Ronan Paddison, 256-272. London: SAGE Publications.
- Skeldon, Ronald. 2018. "International migration, internal migration, mobility and urbanization: Towards more integrated approaches." *IOM Migration Research Series* (53):10.
- Strozza, Salvatore, Federico Benassi, Raffaele Ferrara, and Gerardo Gallo. 2015. "Recent Demographic Trends in the Major Italian Urban Agglomerations: The Role of Foreigners." *Spatial Demography*:1-32. doi: 10.1007/s40980-015-0012-2.
- United Nations. 1980. *Patterns of Urban and Rural Population Growth*. New York: Population Division, Department of Economic and Social Affairs, United Nations Secretariat.
- United Nations. 2018. *World Urbanization Prospects The 2018 Revision*. New York: Population Division, Department of Economic and Social Affairs, United Nations Secretariat.
- World Bank. 2009. *World Development Report 2009: Reshaping Economic Geographies*. Washington DC.: The World Bank.
- Zheng, Zhenzhen, and Ge Yang. 2016. "Internal Migration in China: Changes and Trends." In *Contemporary Demographic Transformations in China, India and Indonesia*, edited by Christophe Z. Guilmoto and Gavin W. Jones, 223-237. Cham Heidelberg New York Dordrecht London: Springer International Publishing Switzerland.