International migrations and urbanisation: 1960-2010

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Abstract

International migrations and urbanisation rates have seen a large increase in the last decades. Here we analyse the relationships between migrations and urbanisation by using a panel of *ca* 200 countries over the period 1960-2010. We describe the main global stylised facts on urbanisation and international migrations focusing on differences in these across world regions. We found that while there was a positive association between *immigration* and urbanisation, particularly in small and medium-sized cities, the association between *emigration* and urbanisation in developing countries was inverse. Both associations have become stronger over the few past decades, and our results highlight that international migration is an increasingly relevant and complementary dimension of the traditional rural-urban reallocation of workers which takes place during economic development.

Keywords

Urbanisation; international migration; urban concentration; development

JEL Classification

R00, R23, F22

1. Introduction

In 1960 one third of the world's population lived in cities. In 2012 this figure reached 52.6%. At this speed of growth, which has been particularly faster in the last two decades, in 2050 around two thirds of the world population will be living in cities. The process of urbanisation is related to the process of economic development, with people migrating from lagged rural areas to developing urban ones, which exhibit higher productivity and offer higher wages. However, migration flows currently occur not just within countries but also increasingly between them, with people also looking for opportunities, derived for instance, by international differentials in productivity levels and real wages. Migrations have important consequences on both sending and receiving countries. In fact, despite the fact that the largest flows have been within countries, the number of persons living outside their country of birth has surpassed 200 million people (almost three per cent of the world's population in 2010). While in OECD countries, the population of foreign origin now represents about 12% of the total population (i.e. are net 'importers' of people), in other parts of the world, such as Central Asia, Central America and the Caribbean, more than 10% of the population has migrated *out* of their country. Acknowledging these two global trends, the aim of this paper has been to inspect whether international migration can be considered as a relevant factor in the evolution of the internal economic geography of countries.

In this work, we analyse the increasing role of cities all over the world, and the importance of international migrations in the process of urbanisation, using a wide database of 197 countries over the period 1960-2010. We focused on differences across world geographical regions in levels of economic development and rates of urbanisation. Urbanisation was examined both quantitatively (i.e. rates) and qualitatively, i.e. by considering urbanisation in small and-medium sized cities and the process of urban concentration in larger agglomerations.

The paper is structured in five sections. After this introduction we present a brief literature review on the determinants of urbanisation, focusing on a potential role for international migrations, which prepares the ground for inspecting the current trends in these two processes through correlation analyses (section 3). In section 4 we use a parsimonious econometric model for urbanisation. Finally, we discuss the main findings and conclusions.

2. Determinants of urbanisation: A brief literature review

The central role of urbanisation in the process of economic development is extensively present in the literature (Lewis, 1954; Ranis and Fei, 1961; Harris and Todaro, 1970; Todaro, 1976, to mention a few seminal papers). In most of these models, migration occurs between lagged rural areas and developed urban areas, driven by the higher wages in the latter due to the higher productivity of the urban sector. As migration proceeds, the economy experiences a structural change moving from

agricultural-based activities to industrial activities, which are the base for economic development (Gollin et al. 2002). However, urbanisation, and urban concentration in large agglomerations, is also maintained by the higher productivity driven by agglomeration economies (even at the risk of urban underemployment, as expressed in Rauch, 1993), with labour mobility being the human side of the agglomeration story. Urbanisation can be seen as a manifestation of development processes, and "migration is a contributor of development, a corrector of regional imbalances, and a conqueror of the tyranny of space," in the words of Firebaugh (1979, p.199).

More recent literature has focused on the process of urbanisation itself, considering not just urbanisation but also urban concentration. In this line, there are papers providing theoretical modelling (Henderson and Wang, 2005), as well as empirical evidence on the association between the sector shift out of agriculture and urbanisation (Brueckner, 1990; Davis and Henderson, 2003; Castells-Quintana and Royuela, 2011 and Franch Auladell et al., 2013). Kasarda and Crenshaw (1991) define three proximate determinants of urban growth: the natural increase of urban population; boundary redefinition through annexation of surrounding areas; and migration, both intra-national (rural-urban and urban-urban) and international. However, as the authors highlight, scholars have focused mainly on rural-urban migration rather than on international migration. The relevant role of other factors driving urbanisation has also been highlighted, including institutions (Henderson and Wang, 2007), adverse rural conditions (Firebaugh, 1979) and climate change - especially in Sub-Saharan Africa (Barrios et al., 2006). Finally, regarding urban concentration, other factors have been found to be relevant. Ades and Glaeser (1995) report as significant determinants, high tariffs, high costs of internal trade and low levels of international trade, as well as political factors, while Davis and Henderson (2003) analyse the role of specific policies like development of interregional infrastructure and fiscal decentralization.

International migrations are an increasingly important factor accompanying traditional internal migrations. However, they are often overlooked in the analyses of urbanisation processes. International migrations can be understood as an equaliser of the marginal productivity of labour not just between rural and urban spaces, but also between countries. Additionally, in the same way as rural-urban migrations within countries, associations are also expected between international migrations and features of the process of economic development and thus also with changes in the economic geography of countries. Of course, we expect migration processes to affect the economic geography of both sending as well as receiving countries.

Overall, as the World Development Report (World Bank, 2009) stresses, "an important insight of the agglomeration literature – that human capital earns higher returns where it is plentiful – has been ignored by the literature of labour migration" (WDR, 2009, p. 158). Novel understandings come

from considering together agglomeration economies and labour migration, which takes place both at the national and at the international level.

3. Data, trends and analysis of the relationship between urbanisation and international migration

3.1. Data and trends

In this section we describe the main trends in urbanisation and international migrations all over the world by exploring variables on population and urbanisation gleaned from the World Bank World Development Indicators at the country level.[1] Regarding migration, our data sources were the World Bank Bilateral Migration Database 1960-2000 and the World Bank Bilateral Migration Matrix 2010. Data are from 197 countries for the years 1960, 1970, 1980, 1990, 2000 and 2010.[2] These datasets provide information on stocks rather than on flows. However, we selected these data because immigration stocks data are based on national censuses, and therefore are probably of higher quality than data reporting annual immigrant flows. Censuses deal with unambiguous, net permanent moves. In our paper we have followed Ortega and Peri (2009), who argue that theoretical models of migration can be interpreted as determining the relationships for stocks of migrants, or the analogous flows. As they do, we will consider the stock of migrants as a proxy of long-term migration flows.

Table 1 presents the main urbanisation trends by continent and world subregion.[3] The urban world population has increased from 33% in 1960 to 51% in 2010. In Africa, America and Asia urbanisation has increased by at least 20 points, in Europe by 16, and in Oceania by 4 (already having a high rate in 1960). In 2010, 15 subregions had more than half of their population living in cities, while in the remaining eight regions the figure was still below 50%. Urban concentration (defined as population living in cities of more than one million inhabitants) has globally risen by 6% in the last 50 years, being especially important in America, Oceania, and in several other subregions, such as Southern Africa and Western Asia. However, the global urbanisation trend has a stronger pace in small and medium-sized cities (i.e. less than one million inhabitants). These cities have grown two times faster than larger cities over the past 50 years (smaller cities: 20% in 1960 to 32% in 2010 vs. larger cities: 13% in 1960 to 19% in 2010). In two regions, Central Asia and Northern Europe, large cities actually lost weight, while small and medium-sized cities were responsible for the entire increase in urbanisation rates. Moreover, in Europe we can see that more

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[1] Urban population refers to people living in urban areas as defined by National Statistical Offices. It has been estimated from World Bank population estimates and urban ratios from the United Nations World Urbanisation Prospects.

[2] The list of countries is reported in Annex 1. These databases can be respectively accessed at http://data.worldbank.org/data-catalog/global-bilateral-migration-database and http://go.worldbank.org/JITC7NYTT0. We used the version collected and revised by Ramos (2013). Over one thousand census and population register records have been combined to construct decennial matrices.

[3] Annex 1 classifies the countries by continent and geographical region.

than 80% of the increase in urbanisation rates was due to the growth of small and medium-sized cities, rather than due to population increases in the large cities. Finally, the growth in urbanisation has been faster in recent decades, and this is true for both small/medium-sized (<1 million inhabitants) and large cities.

Table 2 shows the main demographics trends, also by continent and world subregion. Population growth has slowed down over the last 40 years, although several world subregions still had annual growth rates in excess of 2% in 2010, mainly African regions, Western Asia and Melanesia. Eastern Europe is the only subregion where population has decreased in the past two decades. Regarding migration, although the number of migrants has increased over time, its share of total world population was 3% in 1960 and slightly decreased in 1990 (2.6%), followed by resurgence since then (2.8% in 2010).

Immigration has been particularly pronounced in rich regions, like North America, most of Europe and Australia and New Zealand, compared to other regions. In North America, Western Europe, Australia and New Zealand, immigration largely exceeds emigration. On the other hand, emigration is more important in the Caribbean, Central America, Central Asia, Eastern Europe, Micronesia and Polynesia, with insular regions (such as the Caribbean and the Polynesia) showing the most dramatic increases in emigration rates from 1960 to 2010 and where emigration currently largely exceeds immigration. Interestingly, African regions, Western Asia and Melanesia, with the highest population growth, do not show the highest rates of emigration.

Overall, although urban population has increased in both small and medium-sized cities and in larger cities, among all urban people in the world the proportion of population living in large cities has decreased slightly over the last 50 years (39% in 1960 to 37% in 2010). We found important differences in this across world regions; while in certain regions urban concentration in large cities is substantial (e.g. North and South America, Southern Africa, Australia and New Zealand), in other regions it is the small and medium-sized cities that drives overall urban growth (similarly to European regions and Central Asia). Regarding international migrations, developed regions, which are usually the more urbanised ones, have the highest levels of net immigration (defined as the difference between immigration and emigration), while poorer regions show higher levels of net emigration.

Table 1. World urbanisation trends per world regions. 1960-2010.

	Urban Population (% of total population)						Population living in cities of more than 1 million (% of total population)						Population living in small and medium-sized cities* (% of total population)					
	1960	**1970**	**1980**	**1990**	**2000**	**2010**	**1960**	**1970**	**1980**	**1990**	**2000**	**2010**	**1960**	**1970**	**1980**	**1990**	**2000**	**2010**
Africa	**18%**	**23%**	**28%**	**32%**	**36%**	**40%**	**7%**	**9%**	**10%**	**11%**	**12%**	**13%**	**12%**	**15%**	**18%**	**21%**	**24%**	**28%**
Central Africa	14%	19%	29%	38%	45%	52%	3%	6%	9%	11%	13%	17%	10%	14%	20%	26%	32%	36%
Eastern Africa	7%	10%	15%	18%	21%	24%	2%	3%	4%	5%	6%	6%	5%	7%	10%	13%	15%	18%
Northern Africa	31%	37%	41%	45%	49%	52%	13%	15%	16%	16%	16%	15%	19%	22%	26%	30%	33%	37%
Southern Africa	42%	44%	45%	49%	54%	59%	21%	23%	23%	24%	26%	29%	21%	21%	21%	24%	28%	30%
Western Africa	15%	21%	27%	33%	39%	45%	4%	7%	9%	11%	13%	14%	11%	15%	18%	22%	26%	30%
America	**59%**	**64%**	**69%**	**72%**	**77%**	**80%**	**29%**	**33%**	**34%**	**35%**	**37%**	**38%**	**29%**	**32%**	**34%**	**37%**	**40%**	**42%**
Caribbean	39%	44%	51%	55%	61%	66%	13%	16%	18%	19%	21%	23%	26%	29%	33%	36%	39%	43%
Central America	46%	54%	60%	65%	69%	72%	19%	24%	28%	29%	30%	30%	27%	29%	32%	36%	39%	41%
Northern America	70%	74%	74%	75%	79%	82%	38%	41%	40%	41%	43%	45%	32%	33%	34%	34%	36%	38%
South America	51%	60%	68%	75%	79%	84%	24%	28%	32%	34%	35%	38%	27%	31%	36%	41%	44%	46%
Asia	**20%**	**23%**	**26%**	**32%**	**37%**	**43%**	**9%**	**10%**	**12%**	**13%**	**15%**	**17%**	**11%**	**12%**	**15%**	**19%**	**22%**	**26%**
Central Asia	39%	43%	45%	45%	42%	42%	6%	6%	7%	6%	6%	6%	33%	36%	38%	38%	36%	37%
East Asia	20%	23%	26%	33%	40%	48%	11%	12%	13%	14%	18%	22%	9%	11%	13%	19%	22%	27%
South Asia	17%	20%	23%	26%	29%	32%	7%	8%	9%	11%	12%	13%	11%	12%	14%	16%	17%	19%
Southeast Asia	18%	21%	25%	32%	40%	48%	8%	9%	10%	11%	11%	11%	10%	12%	15%	21%	29%	37%
Western Asia	36%	45%	52%	61%	64%	67%	16%	21%	24%	26%	28%	28%	20%	24%	28%	35%	36%	39%
Europe	**57%**	**63%**	**68%**	**71%**	**72%**	**73%**	**14%**	**15%**	**15%**	**16%**	**16%**	**16%**	**43%**	**48%**	**53%**	**55%**	**56%**	**57%**
Eastern Europe	49%	57%	64%	68%	68%	68%	10%	12%	13%	13%	13%	14%	39%	45%	51%	55%	55%	54%
Northern Europe	71%	73%	82%	83%	84%	85%	24%	22%	21%	20%	21%	21%	47%	51%	61%	62%	63%	64%
Southern Europe	52%	59%	63%	65%	66%	69%	15%	19%	20%	19%	20%	20%	37%	40%	44%	45%	46%	49%
Western Europe	68%	71%	73%	74%	75%	77%	14%	14%	14%	14%	14%	15%	54%	57%	59%	60%	61%	62%
Oceania	**67%**	**71%**	**71%**	**71%**	**70%**	**71%**	**38%**	**41%**	**43%**	**42%**	**41%**	**40%**	**29%**	**30%**	**29%**	**29%**	**29%**	**31%**
Australia & N. Z.	80%	85%	85%	85%	87%	89%	48%	51%	54%	54%	55%	54%	33%	33%	31%	31%	32%	35%
Melanesia	9%	15%	18%	20%	19%	19%	0%	0%	0%	0%	0%	0%	9%	15%	18%	20%	19%	19%
Micronesia	27%	35%	41%	48%	52%	52%	0%	0%	0%	0%	0%	0%	27%	35%	41%	48%	52%	52%
Polynesia	26%	32%	35%	37%	36%	38%	0%	0%	0%	0%	0%	0%	26%	32%	35%	37%	36%	38%
World	**33%**	**36%**	**39%**	**43%**	**47%**	**51%**	**13%**	**14%**	**15%**	**16%**	**18%**	**19%**	**20%**	**22%**	**24%**	**27%**	**29%**	**32%**

*<1 million inhabitants

Table 2. World Demographic trends per world regions. 1960-2010.

	Population Growth - annual rates					Emigrants (as % of local population)						Immigrants (as % of local population)					
	1960-1970	1970-1980	1980-1990	1990-2000	2000-2010	1960	1970	1980	1990	2000	2010	1960	1970	1980	1990	2000	2010
Africa	**2.5%**	**2.7%**	**2.8%**	**2.5%**	**2.3%**	**2.9%**	**2.9%**	**2.9%**	**2.6%**	**2.5%**	**2.9%**	**2.9%**	**2.2%**	**2.0%**	**1.5%**	**1.5%**	**1.5%**
Central Africa	2.1%	2.6%	2.9%	2.8%	2.7%	2.0%	1.8%	2.2%	1.9%	1.8%	2.4%	2.6%	2.0%	1.5%	1.5%	1.1%	1.5%
Eastern Africa	2.8%	2.9%	3.0%	2.7%	2.6%	3.5%	2.8%	2.1%	1.8%	1.7%	2.2%	3.5%	2.7%	1.8%	1.3%	1.2%	1.2%
Northern Africa	2.6%	2.7%	2.6%	1.9%	1.7%	3.1%	3.9%	4.1%	4.1%	3.6%	4.5%	2.1%	1.0%	0.8%	0.7%	0.7%	0.7%
Southern Africa	2.4%	2.3%	2.5%	2.3%	1.3%	2.6%	2.2%	2.1%	2.4%	2.0%	2.5%	4.9%	4.2%	3.4%	3.5%	2.3%	3.5%
Western Africa	2.3%	2.7%	2.7%	2.6%	2.6%	2.4%	2.5%	2.9%	2.4%	2.6%	2.8%	2.3%	2.4%	2.8%	2.1%	2.2%	2.0%
America	**2.0%**	**1.8%**	**1.6%**	**1.5%**	**1.1%**	**1.3%**	**1.5%**	**2.0%**	**2.5%**	**3.4%**	**3.8%**	**4.7%**	**4.0%**	**4.2%**	**4.6%**	**5.5%**	**5.8%**
Caribbean	2.0%	1.6%	1.4%	1.2%	0.9%	7.0%	9.4%	11.2%	13.4%	15.4%	16.3%	2.5%	2.8%	2.6%	2.5%	2.6%	2.1%
Central America	3.0%	2.8%	2.1%	1.8%	1.4%	1.7%	2.0%	3.5%	5.6%	9.0%	10.0%	0.9%	0.6%	0.5%	0.6%	0.8%	0.9%
Northern America	1.3%	1.1%	1.0%	1.2%	0.9%	1.0%	1.1%	1.1%	1.0%	1.1%	1.0%	6.8%	6.6%	7.9%	9.8%	12.7%	13.7%
South America	2.6%	2.3%	2.1%	1.6%	1.2%	0.9%	0.9%	1.2%	1.5%	1.9%	2.5%	3.4%	2.4%	1.9%	1.4%	1.2%	1.1%
Asia	**2.3%**	**2.1%**	**1.9%**	**1.5%**	**1.1%**	**1.8%**	**1.5%**	**1.5%**	**1.5%**	**1.6%**	**1.7%**	**1.9%**	**1.6%**	**1.3%**	**1.3%**	**1.2%**	**1.2%**
Central Asia	3.1%	2.2%	2.0%	0.9%	1.1%	7.3%	8.3%	7.9%	10.2%	12.0%	10.7%	14.9%	16.3%	14.5%	13.3%	9.4%	7.4%
East Asia	2.0%	1.8%	1.4%	1.0%	0.5%	0.8%	0.6%	0.6%	0.6%	0.7%	0.8%	0.4%	0.3%	0.3%	0.3%	0.4%	0.3%
South Asia	2.4%	2.4%	2.4%	1.9%	1.5%	3.2%	2.4%	2.0%	1.7%	1.5%	1.6%	3.1%	2.2%	1.6%	1.1%	0.8%	0.6%
Southeast Asia	2.6%	2.4%	2.2%	1.6%	1.3%	0.6%	0.6%	0.9%	1.4%	1.8%	2.1%	1.8%	1.3%	0.7%	0.6%	0.9%	1.0%
Western Asia	2.7%	2.8%	2.7%	2.2%	2.3%	3.0%	4.2%	5.9%	6.0%	6.2%	5.5%	5.3%	5.7%	6.6%	8.7%	8.4%	9.4%
Europe	**0.8%**	**0.5%**	**0.4%**	**0.1%**	**0.2%**	**7.8%**	**8.0%**	**7.6%**	**7.7%**	**7.2%**	**7.4%**	**4.9%**	**5.8%**	**6.3%**	**7.2%**	**7.7%**	**9.2%**
Eastern Europe	0.9%	0.7%	0.5%	-0.2%	-0.3%	10.3%	10.2%	9.6%	10.2%	9.1%	9.1%	5.9%	6.2%	6.2%	7.0%	6.8%	6.8%
Northern Europe	0.7%	0.3%	0.2%	0.2%	0.5%	7.4%	8.3%	7.8%	7.8%	7.8%	7.3%	4.0%	5.9%	6.7%	7.6%	8.3%	10.7%
Southern Europe	0.8%	0.8%	0.3%	0.1%	0.8%	7.9%	9.3%	8.3%	7.6%	7.5%	8.5%	0.8%	1.3%	1.9%	2.9%	4.5%	9.9%
Western Europe	0.9%	0.3%	0.3%	0.4%	0.3%	3.7%	3.4%	3.5%	3.5%	3.7%	3.9%	6.7%	8.4%	9.7%	10.4%	11.2%	11.5%
Oceania	**2.0%**	**1.7%**	**1.6%**	**1.4%**	**1.7%**	**1.8%**	**2.0%**	**2.7%**	**3.3%**	**4.3%**	**4.1%**	**13.3%**	**15.3%**	**15.0%**	**15.5%**	**15.5%**	**17.9%**
Australia and New Zealand	1.9%	1.5%	1.4%	1.2%	1.5%	2.0%	2.1%	2.6%	3.2%	4.1%	3.9%	15.9%	18.4%	18.5%	19.6%	20.0%	23.8%
Melanesia	2.4%	2.7%	2.4%	2.4%	2.3%	0.6%	0.8%	1.4%	2.0%	2.7%	2.9%	2.2%	2.7%	1.9%	1.4%	1.2%	0.9%
Micronesia	2.7%	2.1%	3.7%	1.9%	0.4%	6.9%	4.8%	10.8%	8.5%	14.7%	12.5%	8.0%	6.5%	6.2%	12.8%	16.8%	16.5%
Polynesia	3.0%	1.7%	1.2%	1.2%	0.9%	4.1%	5.2%	17.5%	20.0%	26.7%	25.9%	2.1%	3.2%	5.5%	6.5%	6.7%	5.5%
World	**2.0%**	**1.9%**	**1.7%**	**1.4%**	**1.2%**	**3.0%**	**2.8%**	**2.7%**	**2.6%**	**2.7%**	**2.8%**	**3.0%**	**2.8%**	**2.7%**	**2.6%**	**2.7%**	**2.8%**

3.2. Correlations between international migration and urbanisation processes

The relationships between the processes of urbanisation and international migration were examined by conducting correlation analyses between these variables at the international level on our panel database. Table 3 displays the correlation coefficients between migration (emigration rate at origin and immigration rate at destination) and urbanisation rate variables calculated from the raw data, or from the data after removal of time and/or country effects,[4] for all sized cities and separately for small/medium-sized and large cities.

Table 3. Correlation coefficients between countries' migration and urbanisation rates. 1960-2010

	Emigration rate at Origin				Immigration rate at Destination			
	Raw data	Removing time effects	Removing country effects	Removing time and country effects	Raw data	Removing time effects	Removing country effects	Removing time and country effects
Population Growth	-0.1236*	-0.1161*	-0.0437	-0.0246	0.2325*	0.2536*	-0.0675*	-0.0154
Urbanisation rate	0.0945*	0.0859*	0.0336	-0.0119	0.5024*	0.5095*	0.1384*	0.0383
Urbanisation rate - 1 Million	-0.0823*	-0.0865*	0.0265	0.0035	0.2034*	0.1998*	-0.0591*	-0.1406*
Urbanisation rate - Small and medium-size cities	0.1657*	0.1605*	0.0288	-0.0144	0.4122*	0.4129*	0.1830*	0.1138*
Urbanisation Growth rate	-0.0542	-0.0505	-0.0286	-0.0213	-0.0964*	-0.0874*	-0.0963*	-0.0534
Urbanisation rate - 1 Million - Growth rate	-0.038	-0.0373	-0.0019	-0.0002	-0.0817*	-0.0761*	-0.0067	0.0186
Urbanisation rate - Small and medium-size cities - Growth rate	-0.0356	-0.0312	-0.0275	-0.0205	-0.0559	-0.0479	-0.0925*	-0.0612

Note: asterisks indicate statistical significance at 5%.

Population growth was positively correlated with immigration rates and negatively correlated with emigration rates. The sign and significance of this relationship persists when the time effect is removed, but disappears when country effects are not present. Consequently, the observed correlation is a country-effect issue, i.e. countries with higher population growth are also those with less emigration and more immigration. On the other hand, urbanisation rates are positively correlated with both emigration and immigration rates, and again the country effect dominates, so the more urbanised countries are the ones with a higher propensity to international migration. However, and interestingly enough, we find conflicting signs for the different urbanisation rates

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[4] In order to remove country and time effects we regressed every variable against time and/or country fixed effects: $Y_{it} = \varphi_i + \phi_t + \varepsilon_{it}$. The residuals of every regression are used to compute the *corrected* correlations. More details of this strategy can be seen in Daveri and Tabellini (2000).

with respect to emigration; it is negatively correlated with urbanisation in cities of more than one million, while it is positively correlated with urbanisation in small and medium-sized cities. Similar conflicting signs are found with respect to immigration when we remove time and country effects. In other words, apparently international immigration is being directed more to smaller cities than to larger ones. Finally, correlations between growth in urbanisation rates and migration rates are generally not significant. The only exception is a significantly negative correlation between urbanisation growth in large cities and immigration: countries with higher growth of large cities (often, developing countries) seem to be those experiencing smaller international immigration rates.

Table 4. Correlation coefficients between countries' migration and urbanisation rates, separately for developed (top table) and developing countries (bottom table). 1960-2010.

Developed countries	Emigration rate at Origin				Immigration rate at Destination			
	Raw data	Removing time effects	Removing country effects	Removing time and country effects	Raw data	Removing time effects	Removing country effects	Removing time and country effects
Population Growth	-0.087	-0.0377	-0.1727*	-0.0759	0.1867*	0.2758*	0.0031	0.2587*
Urbanisation rate	-0.1602*	-0.2072*	0.1749*	0.0653	0.3731*	0.3432*	0.2478*	-0.2070*
Urbanisation rate – 1 Million	-0.3273*	-0.3332*	0.0495	-0.0177	-0.0378	-0.0486	0.1674*	-0.0447
Urbanisation rate - Small and medium-size cities	0.0932	0.0694	0.1771*	0.0749	0.3590*	0.3336*	0.2218*	-0.1905*
Urbanisation Growth rate	0.0308	0.0811	-0.0442	0.0446	-0.0437	0.0053	-0.0757	0.107
Urbanisation rate - 1 Million - Growth rate	-0.019	-0.013	0.0733	0.0926	-0.0538	-0.0346	-0.1265	-0.0494
Urbanisation rate - Small and medium-size cities - Growth rate	0.0393	0.0863	-0.071	0.0113	-0.0241	0.0198	-0.0375	0.1252

Developing countries	Emigration rate at Origin				Immigration rate at Destination			
	Raw data	Removing time effects	Removing country effects	Removing time and country effects	Raw data	Removing time effects	Removing country effects	Removing time and country effects
Population Growth	-0.1348*	-0.1285*	-0.0393	-0.0231	0.3202*	0.3408*	-0.0768*	-0.0464
Urbanisation rate	0.1148*	0.1079*	0.0281	-0.016	0.5365*	0.5530*	0.1234*	0.0695*
Urbanisation rate – 1 Million	-0.0674*	-0.0716*	0.0262	0.0045	0.2433*	0.2408*	-0.0848*	-0.1518*
Urbanisation rate - Small and medium-size cities	0.1903*	0.1874*	0.0225	-0.0194	0.4336*	0.4423*	0.1783*	0.1545*
Urbanisation Growth rate	-0.0627	-0.0607	-0.0304	-0.0264	-0.0985*	-0.0941*	-0.1025*	-0.0818*
Urbanisation rate – 1 Million - Growth rate	-0.0389	-0.0384	-0.0048	-0.0036	-0.0784*	-0.0743*	0.0077	0.0263
Urbanisation rate - Small and medium-size cities - Growth rate	-0.0425	-0.0402	-0.0272	-0.0235	-0.0573	-0.0543	-0.1043*	-0.0927*

Note: asterisks indicate statistical significance at 5%.

Because the analysis of world trends suggest that there are differences across regions according to the level of economic development, we have divided the sample into *developed* countries and

developing countries and have computed the correlation coefficients separately for each[5] (Table 4). When we look at the raw data the basic figures are overall similar to the global ones. The picture is different when we focus on correlations once country and time effects have been removed. We found important differences between developed and developing regions. While in developed countries population growth is significantly correlated with immigration rates, in developing countries this is not the case. On the other hand, urbanisation is negatively correlated with immigration rates in developed regions but still positively correlated in developing countries. The main driver of these differences is the urbanisation rate in small and medium-sized cities, which is negatively correlated with immigration in developed regions but positively correlated in developing countries.

4. Regression Analysis

In this section, the correlation analysis between migration rates and urbanisation goes a step further by controlling for other relevant factors in the urbanisation process. Thus, in order to test the influence on international migration of urbanisation rates we followed the parametric strategy proposed in Barrios et al. (2006):

$$Urban_{it} = \alpha + \beta \boldsymbol{X}_{it} + \delta_t + u_i + v_{it}$$

where $Urban_{it}$ is the urbanisation rate, $\boldsymbol{X}_{it}$ is a vector of time-varying potential determinants, in which we include migration rates, δ_t are time-specific effects common to all countries, u_i are time-invariant country-specific effects, and v_{it} is the usual error term. We did not aim to perform a strict causality analysis but rather to inspect the correlation between urbanisation and international migration once other factors had been cleared, taking advantage of the panel structure of the database, and performing a set of cross-country regression analyses.

For *Urban*, our dependent variable, we considered three different rates: urbanisation, urbanisation in larger cities (> 1 million inhabitants), and urbanisation in smaller cities (<1 million inhabitants). For migration rates we included immigration rate at destination [*immigr*] and the emigration rate at origin [*emigr*]. As controls, we included a list of classical factors in the applied literature: two economic variables, GDP per capita [*GDPpc*] and telephones per capita [*telph_pc*]; three demographic variables, total population [*pop_total*], the proportion of young [*pop_0_14*] and older people [*pop_m65*], and two development variables: life expectancy at birth [*life_exp*] and infant

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[5] In order to classify every country as developed or developing, we have followed the United Nations composition of economic regions, available at http://unstats.un.org/unsd/methods/m49/m49regin.htm#ftnc. Developed countries are the ones included in the following regions: Europe, North America, Japan, Australia and New Zealand.

mortality rates [*mort_inf*]. Even though we assumed that there may be relevant factors that we had excluded from the controls considered, for instance those related to institutions, we deemed that these factors would be mostly captured by development variables or, at a later stage, in the fixed effects specification. Even though these country-specific effects represent a measure of our ignorance, they are a good control for time invariant omitted variables.

The empirical model introduces all variables in logs, except the ones expressed as percentages, and is summarised in the following equation:

$$Urban_{it} = \beta_0 + \beta_1 immigr_{it} + \beta_2 emigr_{it} + \beta_3 \ln GDPpc_{it} + \beta_4 \ln telph\_pc_{it}$$
$$+ \beta_5 \ln pop\_total_{it} + \beta_6 pop\_0\_14_{it} + \beta_7 pop\_m65_{it} + \beta_8 \ln life\_exp_{it}$$
$$+ \beta_9 \ln mort\_inf_{it} + \delta_t + u_i + v_{it}$$

We calculated the between estimates (BE), which can be interpreted as measuring the long-run effects on urbanisation rates, and the fixed-effects estimates (FE), which capture how time-series changes within a country impinge on the changes in its urbanisation rate over time. In addition, given that these coefficients only reflect within-country time-series variation, they can be interpreted as short-run effects. We also performed a pooled estimation ('Pool'), which can be interpreted as an average of the BE and FE estimates. Table 5 displays the descriptive statistics of the main variables of our analysis. Most of the information on urbanisation rates and immigration rates at destination is cross sectional. Consequently, we expected that the BE estimates captured a substantial part of the variation of the urbanisation variables, while the FE results would explain the variations observed within countries over the 50 years considered in our study.

Table 5. Descriptive statistics of main variables in the regression analysis

	Mean	Standard Deviation		
		overall	between	within
Emigration rate at Origin	9.07	23.67	12.78	19.94
Immigration rate at Destination	7.33	11.53	10.62	4.55
Population Growth	1.870	1.444	1.122	0.913
Urbanisation rate	47.78	25.01	23.28	9.27
Urbanisation rate - 1 Million	11.62	16.38	16.12	3.07
Urbanisation rate - Small and medium-size cities	36.16	22.40	20.96	8.00
Urbanisation Growth rate	4.361	4.315	2.789	3.297
Urbanisation rate - 1 Million - Growth rate	0.840	2.209	1.484	1.639
Urbanisation rate - Small and medium-size cities - Growth rate	3.521	4.209	2.600	3.314

In order to obtain robust estimates of the standard errors, the estimates relaxed the usual requirement that the observations are independent, and consequently we allowed for intragroup correlation in the disturbance term: the observations are independent across groups (clusters) but not necessarily within groups. The considered groups are the world's subregions. The results are displayed in table 6.

Table 6. Regression results. Parameter estimates. Full database.

	Urbanisation rate			Urbanisation rate - 1 Million			Urbanisation rate - Small and medium-size cities		
	Pooled OLS	Between	Fixed Effects	Pooled OLS	Between	Fixed Effects	Pooled OLS	Between	Fixed Effects
Immig	0.354***	0.373***	0.299***	0.288	0.268**	-0.152	0.279***	0.105	0.314***
Emig	-0.106	-0.240	-0.020	0.111	0.020	0.011	-0.119	-0.260	-0.031
ln GDP pc	3.871***	7.530***	1.894	0.66	3.936**	0.015	2.232	3.594*	1.879
ln Telph_pc	2.702***	6.126***	2.219**	0.19	2.896	0.203	2.500***	3.229	2.016**
Pop_total	2.844***	1.164	12.531***	3.586***	4.737***	4.202**	-0.432	-3.573***	8.329***
pop_0_14	-0.17	-0.299	-0.096	-0.007	0.578	-0.017	-0.175*	-0.877**	-0.079
pop_m65	-0.132	0.143	0.307	0.242**	-0.287	0.358**	-0.319	0.43	-0.05
ln life_exp	20.571***	1.949	6.91	5.124*	3.348	3.899	13.827**	-1.399	3.01
ln mort_inf	2.792	7.714**	1.489	-0.394	0.29	-0.447	3.030**	7.424*	1.936
1970	1.905		0.807	0.478		0.538	1.687*		0.269
1980	2.920*		1.083	0.121		0.203	3.267***		0.88
1990	4.997**		1.748	-0.311		-0.29	5.828***		2.037
2000	5.411*		0.952	-0.996		-1.127	6.893***		2.078
2010	6.213**		1.144	-1.645		-1.759	8.520***		2.903
Constant	-121.9***	-59.58	-200.1***	-69.06***	-129.18	-68.41**	-43.186*	69.592	-131.74***
N	739	739	739	739	739	739	739	739	739
R²	0.650	0.701	0.744	0.251	0.396	0.352	0.443	0.505	0.664
Adj R²	0.639	0.684	0.739	0.234	0.362	0.339	0.425	0.477	0.657

Note: asterisks indicate statistical significance at 1% (***), 5% (**) and 10% (*).

Immigration rates displayed a positive and significant parameter in all estimates (pooled, between and fixed effects) for the global urbanisation rate, in the between-estimate for larger cities, and in the pooled and fixed effects estimates for the small and medium-sized cities (Table 5). Thus, immigration is clearly linked to within-country increases in urbanisation rates, and this is particularly true for small and medium-sized cities. Quantitatively, the fixed effects estimates report that a 1% increase in the immigration rate is associated to a 0.3% higher urbanisation rate in the small and medium-sized cities

The regression of urbanisation on emigration had a negative, although non-significant sign, as was found for bivariate correlation analysis (see section 3.2). In other words: countries with higher (between estimates) or increasing (fixed effects estimates) emigration rates did not experience smaller or decreasing levels of urbanisation.

The control variables included in the model provided the following results:

1. A global trend in urbanisation was identified, captured by the individual time dummies, which was independent of other factors and statistically significant in small and medium-sized cities. The trend was non-significant for larger cities.

2. Social and economic development is relevant for explaining differences in urbanisation rates between countries, but not over time (the fixed effect estimates were never significant). Only telephones per capita displayed a significant result in small and medium-sized cities, suggesting an important role of connectivity for smaller cities.

3. Population size was significant for almost all estimates. The positive parameter in the fixed effects specification indicates that countries with faster population growth are the ones that experience faster increases in urbanisation rates. We found that on average (between estimates), more populated countries had a smaller proportion of small and medium-sized cities, possibly associated with the trend of growing megacities in many large developing countries such as Brazil, India and China.

4. Even though the demographic structure seems to play a minor role, we did find a number of significant parameters. On the one hand, on average (between estimates) countries with higher urbanisation rates in small and medium-sized cities displayed a negative relationship with the proportion of younger people. On the other hand, countries with a higher proportion of older people saw increases (fixed effects estimates) in the urbanisation rate in larger cities.

To explore in more depth these results, we divided the full sample of countries into economically developed and developing countries. We have seen that developed countries receive more immigrants, while developing countries have more emigrants, leading to expect a different structure of the model for these two groups of countries. On the other hand, as we have also seen there is a certain divide in population trends over the period considered, i.e. in recent periods urbanisation has accelerated, while migration rates have also increased. As most estimates show similar results for the control variables, table 7 only displays the parameters related with international migration.

From this analysis on the developed-developing divide, results show that larger international immigration rates are linked to higher urbanisation rates, particularly for small and medium-sized cities, but also for larger cities (between estimate in developing countries). Contrary to what was found when looking at bivariate correlations, in the regression analysis, once all controls have been taken into account, immigration was not significantly negative associated with urbanisation in larger cities.

Emigration was significant and negative in developing regions, but not so in the developed regions. This result suggests, at least from several estimates, that international emigration from developing countries occurs *at the expense* of local urbanisation: an emigration rate 1% higher is associated to a 0.16% (pool estimate for small and medium-sized cities) to 0.34% (between estimates for the global urbanisation rate) lower urbanisation rate. Our interpretation of this result is that migrants consider as destination both national as well as international urban destinations.

The 1960-1980 period displayed substantially less significant results than the 1990-2010 period. The impact of international migration on urbanisation has been more pronounced in recent decades (i.e. 1990-2010) than earlier (1960-1980). And this is true for both immigration and emigration. We see that the quantitative impact of immigration on urbanisation rates in smaller cities has decreased over time (from 0.31% in the 1960-1980 period to 0.17% in the 1990-2010 period), probably as a consequence of a large increase in urbanisation rates in the smaller cities in developing countries.

Table 7. Regression results. Parameter estimates. Subsamples according to development and time

	Urbanisation rate			Urbanisation rate - 1 Million			Urbanisation rate - Small and medium-size cities		
	Pooled OLS	Between	Fixed Effects	Pooled OLS	Between	Fixed Effects	Pooled OLS	Between	Fixed Effects
Developed									
Immgr. rate	0.372***	0.066	0.302***	-0.018	0.199	-0.064	0.378***	-0.133	0.365***
Emigr. rate	0.096	-0.394	0.134	0.027	0.138	0.030	0.083	-0.532	0.103
Developing									
Immgr. rate	0.402***	0.432***	0.345***	0.066	0.392***	-0.001	0.279***	0.039	0.346***
Emigr. rate	-0.163	-0.341*	-0.086	-0.007	-0.258	-0.029	-0.159*	-0.083	-0.057
All countries. 1960-1980									
Immgr. rate	0.404**	0.218	0.301	0.094	0.231	-0.001	0.279**	-0.013	0.307*
Emigr. rate	0.004	-0.073	0.149	0.019	0.075	0.011	-0.001	-0.148	0.138
All countries. 1990-2010									
Immgr. rate	0.248***	0.392***	0.157***	0.028	0.242**	-0.009	0.169**	0.150	0.167***
Emigr. rate	-0.042	-0.277*	0.022	0.031	0.006	0.010	-0.068	-0.283*	0.012

Note: asterisks indicate statistical significance at 1% (***), 5% (**) and 10% (*).

5. Discussion and conclusions

Individual case studies and regional comparisons analysing the impact of international migration on local cities have been common in the literature. Cross-national research, on the other hand, allows for testing general trends, as well as differences across world regions. The large database in this

paper (*ca* 200 countries over a 50-year period) allowed us to capture the global stylised facts of the relationships between international migrations and urbanisation, which have seldom been considered together (WDR, 2009).

We have identified strong and robust empirical relationships. Using panel estimations we have pointed out that immigration is indeed associated with increasing urbanisation, while emigration is only negatively associated with urbanisation in developing countries. Additionally, small and medium-sized cities are apparently more influenced by international migrations than larger cities, and this process has been particularly important in recent decades. This result is in line with recent calls (OECD, 2009) stressing that in many countries it can be the case that medium-sized and small agglomerations enjoy stronger opportunities for economic development[6].

Our results clearly complement the traditional urbanisation studies where the structural change takes place by internal rural-urban migration processes. While there is no doubt that increasing urbanisation worldwide has become a major challenge for sustainable development, especially in developing countries but also in developed ones, the role of increasing international migrations in shaping the economic geography of countries deserves further research.

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[6] In any case re recognise that these dynamics are not simple. In a recent study Martí and Rodenas (2012) found that up to 25% of foreign immigrants in Spain reallocate within the country two years after their arrival, and that the reallocation is more likely to happen if the first destination was a small municipality.

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Annex 1. Considered countries, classified by continents and geographical regions

(The countries classification by geographical regions corresponds to the United Nations Geoscheme, which can be accessed at http://unstats.un.org/unsd/methods/m49/m49.htm)

Africa

Central Africa	Eastern Africa	Southern Africa
Angola	Burundi	Botswana
Cameroon	Comoros	Lesotho
Central African Republic	Djibouti	Namibia
Chad	Eritrea	South Africa
Congo	Ethiopia	Swaziland
Equatorial Guinea	Kenya	**Western Africa**
Gabon	Madagascar	Benin
Sao Tome and Principe	Malawi	Burkina Faso
Northern Africa	Mauritius	Cape Verde
Algeria	Mozambique	Cote d'Ivoire
Egypt	Rwanda	Gambia
Libya	Seychelles	Ghana
Morocco	Somalia	Guinea
Sudan	Tanzania	Guinea-Bissau
Tunisia	Uganda	Liberia
	Zambia	Mali
	Zimbabwe	Mauritania
		Niger
		Nigeria
		Senegal
		Sierra Leone
		Togo

America

Caribbean	Central America	South America
Antigua and Barbuda	Belize	Argentina
Aruba	Costa Rica	Bolivia
Bahamas	El Salvador	Brazil
Barbados	Guatemala	Chile
Cayman Islands	Honduras	Colombia
Cuba	Mexico	Ecuador
Dominica	Nicaragua	Guyana
Dominican Republic	Panama	Paraguay
Grenada	**Northern America**	Peru
Haiti	Bermuda	Suriname
Jamaica	Canada	Uruguay
Puerto Rico	Greenland	Venezuela
St Kitts and Nevis	United States	
St Lucia		
St Vincent and the Grenadines		
Trinidad and Tobago		
Turks and Caicos Islands		

Asia

Central Asia	East Asia	Western Asia
Kazakhstan	China	Armenia
Kyrgyzstan	Hong Kong	Azerbaijan
Tajikistan	Japan	Bahrain
Turkmenistan	Korea, North	Cyprus
Uzbekistan	Korea, South	Georgia
South Asia	Macao	Iraq
Afghanistan	Mongolia	Israel
Bangladesh	**Southeast Asia**	Jordan
Bhutan	Brunei	Kuwait
India	Cambodia	Lebanon
Iran	Indonesia	Oman
Maldives	Laos	Qatar
Nepal	Malaysia	Saudi Arabia
Pakistan	Myanmar	Syria
Sri Lanka	Philippines	Turkey
	Singapore	United Arab Emirates
	Thailand	Yemen, North
	Vietnam	

Europe

Eastern Europe	Northern Europe	Southern Europe
Belarus	Denmark	Albania
Bulgaria	Estonia	Bosnia and Herzegovina
Czech Republic	Faroe Islands	Croatia
Hungary	Finland	Gibraltar
Moldova	Iceland	Greece
Poland	Ireland	Italy
Romania	Latvia	Macedonia
Russia	Lithuania	Malta
Slovakia	Norway	Portugal
Ukraine	Sweden	San Marino
Western Europe	United Kingdom	Slovenia
Austria		Spain
Belgium		
France		
Germany		
Luxembourg		
Netherlands		
Switzerland		

Oceania

Australia and New Zealand	Micronesia	Polynesia
Australia	Kiribati	French Polynesia
New Zealand	Marshall Islands	Samoa
Melanesia	Micronesia	Tonga
Fiji	Northern Mariana Islands	Tuvalu
New Caledonia	Palau	
Papua New Guinea		
Solomon Islands		
Vanuatu		