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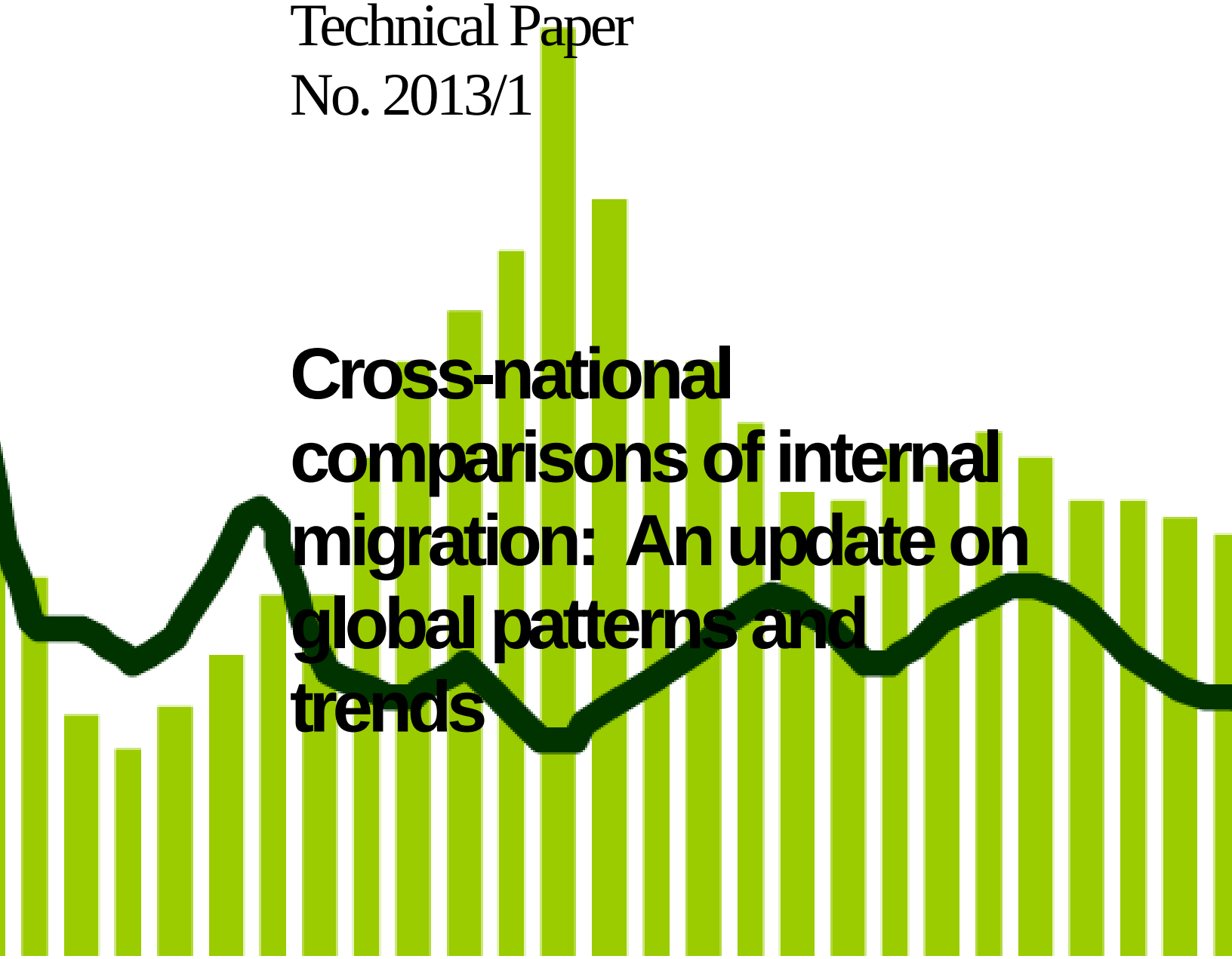
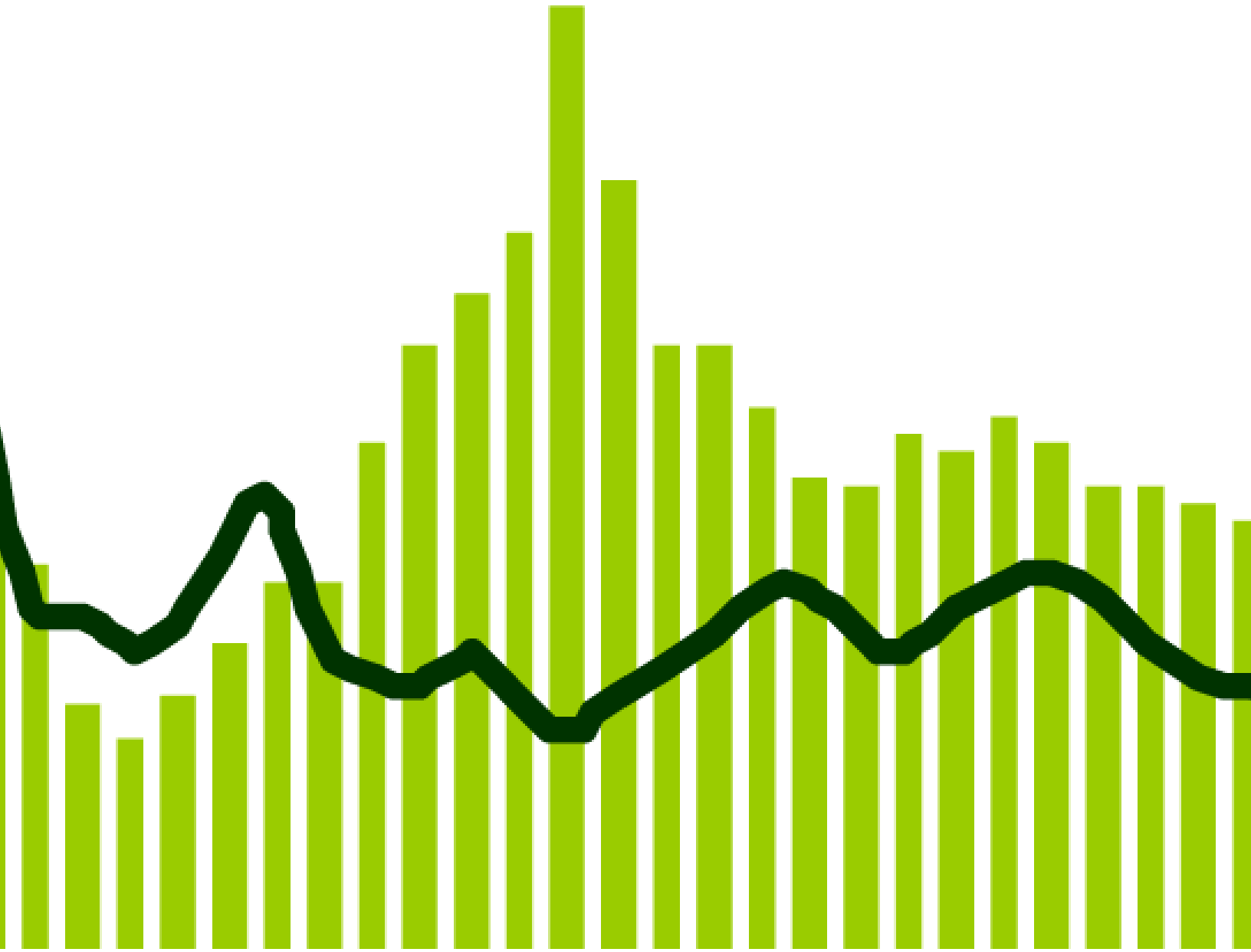
Population Division

Technical Paper
No. 2013/1

Cross-national comparisons of internal migration: An update on global patterns and trends





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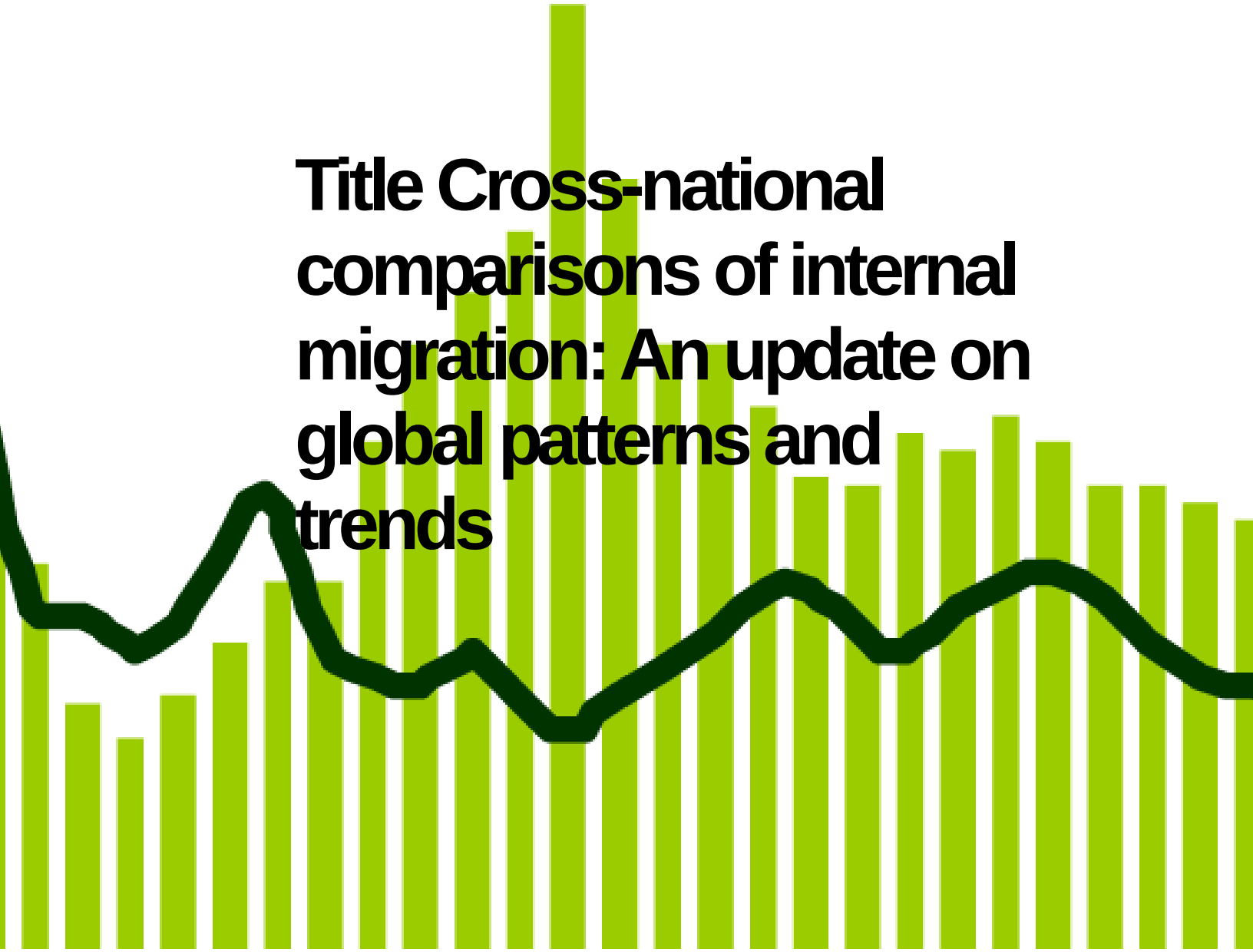

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The term “country” as used in this paper also refers, as appropriate, to territories or areas.

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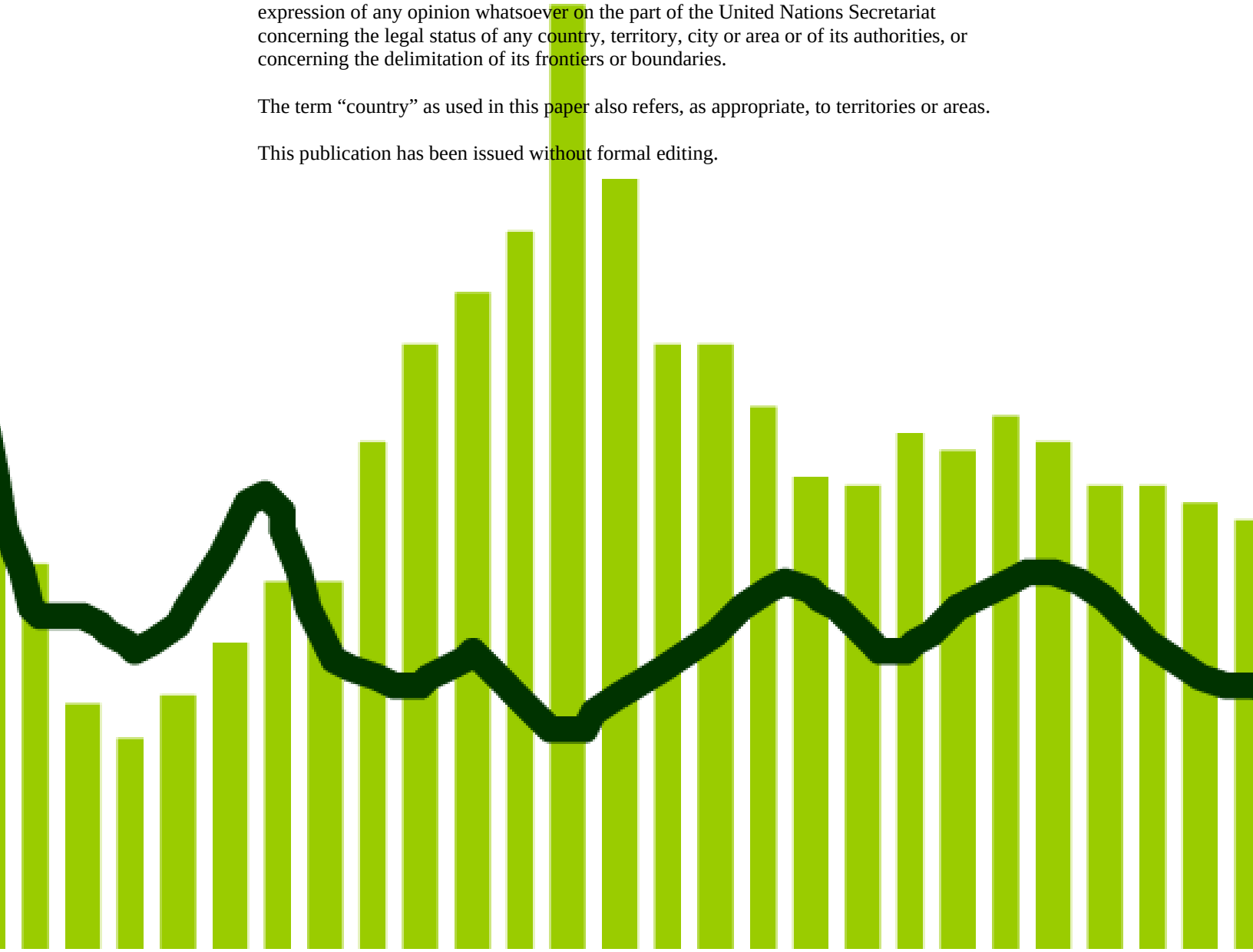

PREFACE

The Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat is responsible for providing the international community with up-to-date and scientifically objective information on population and development. The Population Division provides guidance on population and development issues to the United Nations General Assembly, the Economic and Social Council and the Commission on Population and Development and undertakes regular studies on population estimates and projections, fertility, mortality, migration, reproductive health, population policies and population and development interrelationships.

The purpose of the *Technical Paper* series is to publish substantive and methodological research on population issues carried out by experts within and outside the United Nations system. The series promotes scientific understanding of population issues among Governments, national and international organizations, research institutions and individuals engaged in social and economic planning, research and training.

This paper updates and extends previous work by Bell and Muhidin (2009), to measure and analyze levels and trends in the intensity and spatial impact of internal migration based on census data from the 1990, 2000 and 2010 rounds of census. Migration intensities tend to be highest in the new world countries of Australia, Canada, New Zealand and the United States of America, and lowest in Asia. Intensities in Europe, Latin America and Africa stand at intermediate levels, but with considerable intra-regional diversity. In a majority of countries, more than 10 per cent of the population had migrated outside their region of birth at the time of the 2000 round of censuses. *Five-year* migration intensities have been stable or declining (China being a notable exception) but *lifetime* migration intensities have generally been stable or increasing for the last few decades. The authors estimate that at the global level, as of 2005, there were approximately 763 million persons living within their own country but outside their region of birth. Internal migration has redistributed a sizable proportion of the national population across major regions. These estimates remain preliminary and subject to future revisions as more data become available, but the figure underline the large scale and significance of internal migration. The paper was written by Professor Martin Bell and Dr. Elin Charles-Edwards, both of whom are affiliated with the Queensland Centre for Population Research of the University of Queensland.

The *Technical Paper* series as well as other population information may be accessed on the Population Division's website at www.unpopulation.org. For further information concerning this publication, please contact the office of the Director, Population Division, Department of Economic and Social Affairs, United Nations, New York, 10017, USA, telephone (212) 963-3179; fax (212) 963-2147.

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CROSS-NATIONAL COMPARISONS OF INTERNAL MIGRATION: AN UPDATE ON GLOBAL PATTERNS AND TRENDS

Professor Martin Bell and Dr. Elin Charles-Edwards of Queensland Centre for Population Research, University of Queensland

A. INTRODUCTION

Cross-national comparisons of internal migration remain an embryonic and challenging field of inquiry. Compared with other areas of demography, particularly fertility and mortality, there is no single repository of data capturing mobility within countries, and comparisons are hindered by widespread variation in data collection practices. These include differences in the types of data collected (e.g. events versus transitions), the intervals over which migration is measured (e.g. one year, five years, since birth, or latest move regardless of the timing), and the statistical geography over which migration is defined. Over the past decade, there have been a number of concerted attempts to address these issues. Bell and others (2002), surveyed key issues hampering cross-national comparisons of internal migration and proposed a series of indicators, which could provide a basis for such comparisons. Bell and Muhidin (2009), subsequently utilised a number of these metrics to estimate the intensity, age patterns, and spatial impacts of internal migration for 28 countries. A large-scale international research project, Comparing **I**nternal **M**igration **A**round the **G**lobe**E** (IMAGE), is currently extending this work to cover a majority of the 193 United Nations Member States. While final results will take some time, it is useful to provide progressive updates on the task of drawing together rigorous comparisons. Accordingly, this paper has been assembled to summarise progress on the IMAGE project and the current state of knowledge on global trends in internal migration. The paper updates and extends the analysis undertaken for the United Nations Development Programme by Bell and Muhidin in 2009, and has been formulated principally to provide input to the forty-sixth session of the Commission on Population and Development, on the theme *New Trends in Migration: Demographic Aspects*.[1]

B. INTERNAL MIGRATION DATA: A GLOBAL INVENTORY

An essential pre-requisite to conducting cross-national comparisons, is an understanding of internal migration data collections around the globe. There is considerable heterogeneity in the types of data collected across countries, variations which can be traced in part at least to the absence of international statistical standards for the measurement of internal migration. A primary objective of the IMAGE project is to develop a Global Inventory of Internal Migration Data collected by the 193 United Nations Member States. In January 2013, the inventory held information for 179 countries (table 1).

[1] Scheduled to take place from 22 to 26 April 2013 at the United Nations Headquarters in New York.

Censuses are the most common source of internal migration data around the globe with 142 countries collecting information on internal migration in the United Nations 2000 round of censuses (1995-2004). At the time of writing, the IMAGE inventory identified 106 countries collecting data in the United Nations 2010 round of censuses (2005-2014), but this number is expected to increase as censuses scheduled for the latter part of the Round are completed. Globally, fifty countries are known to compile internal migration data from a population register or other administrative collection, while 111 countries drew data from some form of survey since 1995**.**

TABLE 1. COUNTRIES COLLECTING DATA ON INTERNAL MIGRATION BY CONTINENT, 2000 AND 2010 ROUND OF CENSUSES AND OTHER SOURCES

Region	2000 Round of Censuses	2010 Round of Censuses	Register	Survey[1]	Multiple data sources	Total countries collecting internal migration data	Total No. of countries
Africa	32	27	0	38	31	50	54
Asia	34	24	15	23	26	40	46
Europe	32	23	32	34	36	42	44
Latin America and the Caribbean	28	19	0	12	12	31	32
North America	3	2	2	2	2	3	3
Oceania	13	11	1	2	3	13	14
Total	142	106	50	111	110	179	193

Source: IMAGE Inventory of Internal Migration. Available from http://www.gpem.uq.edu.au/image (accessed January 2013).

[1] Surveys counted in table 1 are limited to USAID's Demographic and Health Surveys, the World Bank's Living Standards and Measurement Survey, the European Union Labour Force Surveys and a number of large scale demographic and migration surveys conducted since 1995. The final category includes the National Household Survey (Canada), National Sample Survey (India), Malaysian Migration Survey (Malaysia), Labour Force Survey (Pakistan), The Syrian Migration Survey (Syria), Thailand Migration Survey (Thailand), the American Community Survey (USA), Current Population Survey (USA) and Vietnam Migration Survey (Viet Nam).

There are clear regional variations in the sources from which internal migration data are derived. Censuses are the most common source in Africa, Asia, Latin America and the Caribbean, and Oceania, while population registers and administrative collections are most prominent in Europe, and are becoming increasingly common with the shift away from traditional censuses (Valente, 2010; Coleman, 2013). Surveys are also widely used across the globe, but vary in their coverage, from nationally representative population surveys (e.g., the American Community Survey), to surveys directed primarily to females of reproductive age (e.g., Demographic Health Surveys). More than half of all countries (110) draw internal migration data from multiple sources.

There are a number of impediments to comparison of internal migration data collected from the three different sources. The most fundamental is whether migration is measured as a fixed transition, as an event, as the latest move, or over a lifetime. Fixed interval transition data are most commonly associated with national censuses (but are also collected by many surveys) and are derived by comparing a person's place of residence at the time of

enumeration with their place of residence at some earlier date (Bell and others, 2002). One year and five year intervals are most common, but other transition intervals are also widely used. Transition data measure the number of movers rather than the number of moves and miss both return and onward movements made during the observation period. Comparing transition data over different length intervals is fraught because the number of migrants does not increase arithmetically with time. Thus, the number of migrants captured over a five-year period is not equivalent to five times the number captured over a one-year period (Long and Boertlein, 1990).

Transition data can also be derived from population registers, but, in practise, registers are most commonly associated with migration events, which capture all moves made during a defined interval (Bell and others, 2002). Latest move data are derived by asking respondents for their place of previous residence irrespective of the time of the move, and are commonly combined with a question on duration of residence. These are widely found in censuses and surveys but their utility for cross-national comparisons is limited by differences in the way duration of residence is measured. Lifetime data are derived by comparing place of birth (within a country) by place of current residence, and are collected both by censuses and surveys, but are less commonly available from register-based statistics.

In addition to differences in the types of migration data collected by censuses, registers and surveys, cross-national comparisons of internal migration are hindered by differences in population coverage, in the temporal comparability of statistics, in data quality, and in the spatial framework over which migration is measured—that is, the number of zones into which countries are divided. These constraints are elaborated in detail in Bell and others (2002). The IMAGE project is seeking to address a number of these issues, but for the purposes of the comparison reported here, the focus is on five-year and lifetime migration data collected by national censuses, as these are the most widespread around the globe and thus allow for the best available international coverage and comparability.

As shown in table 2, there is significant variation in the types of migration data collected in national censuses. In the 2000 round of censuses, place of birth (lifetime) data were the most common, being collected by 122 nations. A further 29 countries measured migration over a one-year interval, while 52 countries employed a five-year interval and 55 collected data on latest move regardless of timing. In many cases, more than one form of data was collected. One-year intervals tend to be most popular in Europe, and have the benefit of more closely aligning census data with register-based estimates, which are also generally published as annual statistics (although problems of harmonisation still require attention (Bell and Rees, 2006). Five-year interval data are especially prominent in Latin America and Oceania, while latest move data are common in Africa and Asia. Place-of-birth data feature strongly in censuses across all continents but were least ubiquitous in Europe and Asia.

TABLE 2. INTERNAL MIGRATION DATA COLLECTED IN THE 2000 ROUND OF CENSUSES (1995-2004)

Region	Type of Data						Total No. of countries collecting data
	Observation Period					Duration of residence	
	One year	Five years	Other fixed interval	Lifetime	Latest move		
Africa	9	8	8	29	13	17	32
Asia	1	13	8	26	18	24	34
Europe	14	4	12	26	10	13	32
Latin America and the Caribbean	2	16	2	28	12	13	28
North America	1	3	0	3	0	0	3
Oceania	2	8	2	10	2	5	13
TOTAL	29	52	32	122	55	71	142

Source: IMAGE Inventory of Internal Migration. Available from http://www.gpem.uq.edu.au/image (accessed January 2013).

Table 3 summarises the available information on data being collected as part of the census round of 2010. Lifetime migration data are again the most common (88 of 106 countries), followed by data on latest moves, and five-year transitions. A large number of African countries are yet to conduct a census in the current round, which partly accounts for the prominence of five-year over latest-move data. Regional patterns of migration data collection mirror those in the census round of 2000, with one-year data prominent in Europe, and five-year data dominating collections in Latin America and Oceania. Like other census topics, collection practices for internal migration data tend to have a high degree of inertia in individual country collections.

TABLE 3. INTERNAL MIGRATION DATA COLLECTED IN THE 2010 ROUND OF CENSUSES (2005-2014)

Region	Type of Data						Total No. of countries collecting data
	Observation Period					Duration of residence	
	One year	Five year	Other fixed interval	Lifetime	Latest move		
Africa	8	7	5	26	10	9	27
Asia	5	12	3	16	12	9	24
Europe	12	3	2	16	10	14	23
Latin America and the Caribbean	1	13	3	19	8	10	19
North America	1	2	0	2	0	2	2
Oceania	4	10	1	9	0	9	11
TOTAL	31	47	14	88	40	53	106

Source: IMAGE Inventory of Internal Migration Available from http://www.gpem.uq.edu.au/image (accessed January 2013).

C. DATA USED IN THE CURRENT STUDY

Table 4 sets out the data used for the analysis presented in this report. Attention is focused on five-year transitions and lifetime migration, both because of their widespread availability across countries and regions, and to facilitate comparison with the results

reported by Bell and Muhidin (2009). Although latest-move data are also widely collected, differences between countries in measuring residence duration severely prejudice their utility for cross-national comparison (Bell, and others, forthcoming). Data for 37 countries are drawn on from the Integrated Public Use Microdata Series (IPUMS) held by the Minnesota Population Center. IPUMs data are an invaluable resource for cross-national comparison of internal migration, but are inevitably subject to sampling variability. The sample sizes of IPUMs and other data analysed in this report are shown in appendix A. Full census information for an additional 22 countries in Latin America and the Caribbean has been extracted from the CELADE Internal Migration Database, while data for a number of other countries have been obtained directly from national statistical agencies (NSAs).

Our dataset therefore encompasses 70 countries and over 4.8 billion people, equivalent to 71 per cent of the global population in 2010. This is 42 countries more than were available to Bell and Muhidin (2009) and encompasses an additional 753 million people. The dataset covers 16 countries in Africa, 25 in Asia, 10 in Europe, 23 in Latin America and the Caribbean, 3 in North America and 3 in Oceania. Where possible, data have been obtained for the 1990, 2000 and 2010 round of censuses to facilitate temporal comparisons in the intensity and spatial impacts of migration. Coverage is most complete for the 2000 round of censuses, with five-year or life-time data available for 60 countries. Data for 43 countries are available for the 1990 round of censuses, and for 21 countries in the 2010 round of censuses.

TABLE 4. SUMMARY OF DATA HELD IN IMAGE REPOSITORY, BY COUNTRY AND CENSUS ROUND

		1990 Round of Censuses			2000 Round of Censuses			2010 Round of Censuses		
		Year	five-year	Lifetime	Year	five-year	Lifetime	Year	five-year	Lifetime
Africa										
1	Botswana				2001		x[1]			
2	Egypt				1996		x	2006		x
3	Ghana				2000	x	x			
4	Guinea				1996		x			
5	Kenya	1989		x	1999		x			
6	Malawi	1987		x						
7	Mali	1987		x	1998		x			
8	Mauritius				2000	x				
9	Rwanda	1991		x	2002		x			
10	Senegal	1988	x	x	2002	x	x			
11	South Africa				2001	x	x	2007		x
12	Sudan							2008		x
13	Tanzania				2002		x			
14	Uganda				2001		x			
15	Zambia	1990		x	2000		x			
16	Zimbabwe				2002		x			
Asia										
1	Bhutan							2005		x
2	Cambodia				1998		x	2008		x
3	China	1990	x	x[1]	2000	x	x			
4	India	1991		x	2001		x			
5	Indonesia	1990	x		2000	x	x	2010	x	x
6	Iraq				1997		x			
7	Japan							2010	x[1]	
8	Kyrgyz Rep.				1999		x			
9	Malaysia	1991	x	x	2000	x	x			
10	Mongolia	1989		x	2000	x	x			
11	Nepal				2001	x	x			
12	Philippines	1990		x	2000	x				

13	Thailand	1990		x	2000		x				
14	Vietnam	1989	x		1999	x		2009	x		
15	Turkey	1990		x	2000		x				
Europe											
1	Armenia				2001		x				
2	Belarus				1999		x				
3	France	1990		x	1999		x	2006		x	
4	Greece	1991	x		2001	x					
5	Ireland				2002		x	2006		x	
6	Portugal	1991	x	x	2001	x	x				
7	Romania	1992		x	2002		x				
8	Slovenia				2002		x				
9	Spain	1991		x	2001		x				
10	Switzerland	1990	x[1]		2000	x[1]					
Latin America and the Caribbean											
1	Antigua and Barbuda	1991		x	2001		x				
2	Argentina	1991	x		2001	x	x				
3	Barbados	1990	x	x	2000	x	x				
4	Belize	1990		x	2000		x				
5	Bolivia	1992	x	x	2001	x	x				
6	Brazil	1991	x		2000	x	x				
7	Chile	1992	x		2002	x	x				
8	Colombia	1993	x					2005	x	x	
9	Costa Rica				2000	x	x	2011	x	x	
10	Cuba				2002		x				
11	Dominican Rep.				2002	x	x				
12	Ecuador	1990	x		2001	x	x				
13	El Salvador	1992		x				2007		x	
14	Guatemala	1994		x	2002		x				
15	Honduras	1988	x	x	2001	x	x				
16	Jamaica	1991		x	2001		x				
17	Nicaragua	1995	x	x				2005	x	x	
18	Panama				2000		x				
19	Paraguay	1992	x	x	2002	x	x				
20	Peru	1993	x	x				2007	x	x	
21	Saint Lucia				2001		x				
22	Uruguay	1985	x		1996	x	x				
23	Venezuela	1990		x	2001	x	x				
North America											
1	Canada	1991	x		2001	x		2006	x		
2	Mexico	1995	x	x	2000	x	x	2005	x	x	
3	USA	1990	x	x	2000	x	x	2005	x[2]	x	
Oceania											
1	Australia	1991	x		2001	x		2011	x		
2	New Zealand							2006	x		
3	Vanuatu							2009	x	x	

Source: Authors' calculations, based on data in IMAGE Inventory of Internal Migration Available from http://www.gpem.uq.edu.au/image (accessed January 2013).

[1] Migration status only.

[2] Five-year data are derived from the 2005 Current Population Survey.

D. COMPARISON OF MIGRATION INTENSITIES

1. Five-year intensities

Table 5 sets out five-year migration intensities[2] calculated for various countries and census rounds. Five-year transition data is available for a total of 36 countries. Since the

[2] Crude Migration Intensity (CMI) is calculated for a number of levels of spatial disaggregation, and computed by expressing the total number of internal migrants (M) in a given time period as a percentage of the population at risk (P) such that CMI = 100M/P (see Rees and others, 2000 for a comprehensive definition).

value of the intensity varies according to the spatial framework employed, table 5 also sets out the number of regions between which migration has been measured in each case. Separate rows in the table indicate where data are available at different spatial levels. Focusing initially on the 2000 round of censuses (for which coverage is most complete), the results reveal wide-ranging variation in the level of migration intensity between countries. Table 5 shows migration intensities ranging from a low of less than 0.8 per cent of people moving between the eight regions of Indonesia over the previous five years, to a high of 20.5 per cent (one person in five) relocating between the 74 Territorial Authorities of New Zealand. Movement intensities of 10 per cent or more were recorded between municipalities in South Africa and Canada, between parishes of Portugal, cantons of Costa Rica, provinces of Bolivia, districts of Paraguay and statistical divisions of Australia. In contrast, movements between regions of Viet Nam and Portugal registered intensities of less than 2 per cent. A similar level of heterogeneity is observed in the 1990 and 2010 round of censuses. Over the five-years prior to the 1990 census, only 1.1 per cent of the population moved between provinces of China, while 20.7 per cent of Canada's population moved between municipalities. In the 2010 round of censuses, 2.4 per cent of Indonesians moved between 33 provinces, while 21.2 per cent moved between 351 Australian Statistical Areas (SA3s).

Marked shifts in five-year migration intensities are apparent across the 1990, 2000 and 2010 round of censuses. Between 1990 and 2000, inter-provincial migration in China more than doubled, while intensities in other parts of Asia tended to fall. Stable or declining intensities were also observed across much of Latin America and the Caribbean, and in the new world countries of Australia, Canada and the United States of America. Rising intensities were observed in southern Europe and in Senegal, the only African country for which time series data is available. While it is impossible to pinpoint causal mechanisms on the available evidence, the regionalisation of trends is suggestive. Speculation about declining five-year intensities in Asia and Latin America and the Caribbean between the 1990 and 2000 round of censuses may be due to a dampening of labour migration flows during the financial crises of the late 1990s. Observed declines in five-year migration intensity in Australia, Canada and the United States are likely to have a different origin. Although these countries still record amongst the highest levels of geographical mobility anywhere in the world, there is a growing body of evidence for a structural decline in mobility tied to the completion of the urban transition, economic maturation and population ageing (Zelinsky, 1971; Cooke, 2011).

Between the 2000 and 2010 rounds of censuses, intensities rose in several Asian countries. These increases may reflect economic recovery subsequent to the financial crisis of the 1990s, and the continued urbanisation of these populations. It is more difficult to speculate on trends across Latin America, Europe and Africa due to the small numbers of countries for which data are available. The data do, however, provide further evidence of a sustained decline in mobility across the new world countries of Australia, Canada and the

United States of America.

TABLE 5. FIVE-YEAR CRUDE MIGRATION INTENSITY BY COUNTRY AND TYPE OF REGION, 1990, 2000 AND 2010 ROUNDS OF CENSUSES

		1990		2000		2010		Trend	
	Country	**No. of Regions**	**Intensity (%)**	**No. of Regions**	**Intensity (%)**	**No. of Regions**	**Intensity (%)**	**1990-2000**	**2000-2010**
Africa									
1	Ghana			10	3.5				
				110	6.0				
2	Mauritius			14	5.4				
3	Senegal			11	3.7				
		30	5.9	34	8.1			RISE	
4	South Africa			9	4.3				
				52	13.2				
Asia									
1	China	30	1.1	31	2.7			RISE	
		347	3.4	347	6.7			RISE	
2	Indonesia	7	1.1	7	0.8			FALL	
		26	2.9	26	2.2	33	2.4	FALL	RISE
				280	3.9				
				314	4.0	456	4.4		RISE
3	Japan					47	5.8		
4	Malaysia	15	7.2	15	4.8			FALL	
		132	13.3	133	8.0			FALL	
5	Mongolia			21	8.5				
6	Nepal			74	3.3				
7	Philippines			16	2.5				
				83	3.3				
				1610	4.6				
8	Vietnam	8	2.5	8	1.9			FALL	
		61	3.4	61	2.9	63	4.3	FALL	RISE
				663	4.6	660	6.5		RISE
				1203	6.5				
						9111	8.6		
Europe									
1	Greece	54	5.4	54	6.0			RISE	
				1034	10.3				
2	Portugal	7	1.8	7	1.9			RISE	
		22	2.9	22	3.2			RISE	
		308	5.7	308	7.1			RISE	
				4000	14.4				
3	Switzerland	25	6.6	26	6.1			FALL	
				2896	20.2				
Latin America and Caribbean									
1	Argentina	24	6.3	24	3.6			FALL	
				511	7.2				
2	Barbados	11	6.9	11	6.4			FALL	
3	Bolivia	9	5.6	9	6.0			RISE	
				112	10.0				
4	Brazil	5	2.2	5	2.2			STABLE[1]	
		27	3.9	27	3.4			FALL	
		1540	10.7	1520	10.0			FALL	
5	Chile	13	6.5	13	6.3			STABLE	
		44	9.6	44	9.6			STABLE	
				178	16.7				
6	Colombia	10	6.1						
		31	8.2			33	4.2		
		529	13.5			532	6.4		
						1105	7.4		
7	Costa Rica			7	5.5	7	5.6		STABLE
				60	10.6				
				81	10.7	81	10.4		STABLE
8	Dominican Republic			9	4.2				
				225	6.4				

9	Ecuador	22	6.2	22	5.6			FALL	
		117	8.6	128	8.3			STABLE	
10	Honduras	18	4.9	18	4.2			FALL	
				298	7.2				
11	Nicaragua			17	3.5	17	2.5		FALL
				145	5.2	153	4.1		FALL
12	Paraguay	18	9.1	18	7.6			FALL	
				236	11.5				
13	Peru	25	8.6			25	5.4		
						1833	11.8		
14	Uruguay	19	7.5	19	6.5			FALL	
15	Venezuela			24	5.1				
North America									
1	Canada	11	4.0	11	3.4	13	2.9	FALL	FALL
		288	14.9	288	12.5	288	11.3	FALL	FALL
		5600	20.7	5600	16.6	4916	15.0	FALL	FALL
2	Mexico	32	4.9	32	4.4	32	2.5	FALL	FALL
						2438	5.2		
3	USA			4	4.8				
		9	7.0	9	6.6			FALL	
		51	9.6	51	8.9			FALL	
Oceania									
1	Australia	8	5.4	8	4.8	8	4.4	FALL	FALL
		38	16.5	38	14.9			FALL	
		69	18.2	69	16.5	88	15.5	FALL	FALL
						351	21.2		
2	New Zealand			14	11.6	16	11.0		FALL
				74	20.5	73	20.5		STABLE
3	Vanuatu					6	7.3		
TOTAL (no. of countries)			**23**		**31**		**12**		

Source: Authors' calculations, based on data in IMAGE Inventory of Internal Migration Available from http://www.gpem.uq.edu.au/image (accessed January 2013).

[1] STABLE is defined as a change of less than ±5 per cent

The ability to draw cross-national comparisons of migration from the data in table 5 is fundamentally prejudiced by differences in the number of zones against which the migration is being recorded. As described in Bell and Muhidin (2009), Courgeau's *k* offers an alternative metric for the comparison of aggregate migration intensities. As Courgeau (1973) observed, if, as is known to be true, there is a relationship between the propensity to move and distance, there must also be a relationship between the level of mobility and the number of zones into which a space is divided. The finer the spatial mesh, the larger the number of migrations that will be recorded, and, hence, the greater the apparent migration intensity. Courgeau's (1973) formula CMI = $k \ln (n^2)$ endeavours to capture this link in a simple linear equation, which connects migration intensity to the natural log of the square of the number of regions. Computation of *k* requires migration data for multiple levels of geography within each country, and these are only available for 29 of the 36 countries for which we have five-year transition data. Results of the analysis are set out in table 6 and the coefficient of determination reported as a measure of goodness of fit. The parameter *k* is not intrinsically meaningful—it has no plain language meaning in the same way as indicators such as the TFR or life expectancy, but values of *k* are directly comparable between countries. The higher the value of *k* (that is the steeper the slope of the regression line) the greater the intensity of migration. Indeed, *k* is directly scalable, such that a value of *2k* indicates an underlying

migration intensity double that of *k*.

The results of the Courgeau *k* analysis help clarify the patterns and trends of individual intensities measured at different levels of geographical subdivision. Australia, Malaysia and the United States of America emerge as the most mobile countries in the 1990 round of censuses, and China, Indonesia and Portugal as the least mobile. In the 2000 round of censuses, Australia is again amongst the most mobile countries along with South Africa and Chile, while Indonesia, Honduras and the Philippines are the least mobile. Data from the 2010 round of censuses indicate that New Zealand is the most mobile country, followed by Australia and Costa Rica. Looking across the three rounds of censuses, some regional groupings are apparent. Led by New Zealand, Australia, Canada and the United States of America, developed new world countries exhibit the highest values of *k*. Asian countries, with the exception of Malaysia, consistently exhibit low values of *k*. The picture is more varied in Africa, Latin America and Europe, with these regions gravitating to more moderate levels of mobility. Considered in sequence, these results from the three rounds of censuses confirm the general decline in mobility observed across many countries over the thirty-year period, with China being the notable exception. The last two columns of table 6 summarise the decennial trend, with the result denoted 'STABLE' if the change over time was less than plus or minus 5 per cent.

2. Lifetime intensities

For lifetime migration intensity, data are available for 62 countries. The results (table 7) are consistently higher than for the five-year period and in several cases reveal a remarkable level of lifetime mobility. Thus, in the 2000 round of censuses, 50 per cent of the population in Chile were living outside of their municipality of birth, as were around two-fifths of Brazilians and Spaniards. Similarly, two fifths of the French population were living outside of their department of birth, while lifetime migration intensities over 30 per cent were recorded between districts of Botswana, Panama and Paraguay, between states of the United States of America, and between cantons of Costa Rica.

Trends in lifetime intensities across the 1990, 2000 and 2010 rounds of censuses present a markedly different picture from those apparent in the five-year data, with much more stability over this twenty-year period. Between the 1990 and 2010 census rounds, there was in fact a modest tendency towards increasing lifetime migration across Asia and Latin America. While initially surprising, given the decline in five-year intensities observed in these regions over the same period, this trend can be readily explained by the inertia inherent in lifetime migration data. As people age, they effectively accumulate more moves and, since the population in most countries is ageing, the cumulative national lifetime migration experience is rising. Also, as observation periods lengthen, the average migration distances tend to increase, so that, on balance, an older population has a greater chance of being

displaced from its region of origin. The consequence is that, *ceteris paribus*, population ageing will raise lifetime intensities, at least until return migration begins to hold sway at older ages. It may be this latter process that accounts for the fall in lifetime intensities in Europe and the United States of America (table 7).

TABLE 6. COURGEAU'S *K*[1], FIVE-YEAR MIGRATION INTENSITY BY COUNTRY AND TYPE OF REGION, 1990, 2000 AND 2010 ROUND OF CENSUSES

		1990		2000		2010		Trend	
	Country	**k**	**r^2**	**k**	**r^2**	**k**	**r^2**	**1990-2000**	**2000-2010**
Africa									
1	Ghana			0.66	0.90				
2	Senegal			1.03	0.77				
3	South Africa			1.50	0.82				
Asia									
1	China	0.26	0.78	0.53	0.87			RISE	
2	Indonesia	0.40	0.83	0.33	0.95	0.36	0.99	FALL	RISE
3	Malaysia	1.36	1.00	0.83	0.98			FALL	
4	Philippines			0.34	0.67				
5	Vietnam			0.40	0.89	0.49	0.98		RISE
Europe									
1	Greece			0.75	1.00				
2	Portugal	0.49	0.99	1.22	0.96			RISE	
3	Switzerland			1.22	0.96				
Latin America and Caribbean									
1	Argentina			0.57	0.61				
3	Bolivia			1.11	0.83				
4	Brazil	0.70	0.98	0.65	0.97			FALL	
5	Chile	1.27	1.00	1.46	0.89			RISE	
6	Colombia	1.10	0.96			0.53	0.88		
7	Costa Rica			1.27	0.96	1.23	0.94		STABLE[2]
9	Ecuador	0.93	0.93	0.86	0.98			FALL	
10	Honduras			0.33	0.93				
11	Nicaragua			0.55	0.84	0.41	0.99		FALL
12	Paraguay			0.38	0.95				
13	Peru					0.79	1.00		
North America									
1	Canada	1.21	0.97	0.99	0.96	0.90	0.94	FALL	FALL
2	Mexico					0.33	0.99		
3	USA	1.31	0.43	1.22	0.33			FALL	
Oceania									
1	Australia	2.09	0.87	1.89	0.87	1.74	0.94	FALL	FALL
2	New Zealand					2.27	0.92		
TOTAL (no. of countries)			**11**		**23**		**10**		

Source: Authors' calculations, based on data in IMAGE Inventory of Internal Migration Available from http://www.gpem.uq.edu.au/image (accessed January 2013).

[1] CMI = *k* ln (n2).
[2] STABLE is defined as a change of less than ±5 per cent.

Table 8 sets out the values of Courgeau's *k* for lifetime migration intensities for 28 countries. Among the developed nations, the United States of America stands out with the highest *k* value at the 2000 round of censuses, followed closely by France and Spain, which show intermediate levels of mobility. Latin America again displays a diverse profile, with high mobility in Chile, Costa Rica, Cuba and Panama, but substantially lower levels in Brazil and Colombia. On the whole, however, these values are well above the figures for the small

sample of Asian countries. A more mixed picture emerges in Africa, with Zambia and Ghana recording a relatively high value of *k*, and Uganda a relatively low value.

TABLE 7. LIFETIME CRUDE MIGRATION INTENSITY BY COUNTRY AND TYPE OF REGION, 1990, 2000 AND 2010 ROUNDS OF CENSUSES

		1990 Census Round		2000 Census Round		2010 Census Round		Trend	
	Country	**No. of Regions**	**Intensity (%)**	**No. of Regions**	**Intensity (%)**	**No. of Regions**	**Intensity (%)**	**1990-2000**	**2000-2010**
Africa									
1	Botswana			28	30.7				
2	Egypt			27	7.5	27	6.8		FALL
3	Ghana			10	17.8				
				110	27.8				
4	Guinea			34	15.8				
5	Kenya	8	12.6	8	12.6			STABLE[1]	
		41	17.4	69	20.3			RISE	
6	Mali	47	13.3	47	11.5			FALL	
7	Malawi	24	18.7						
8	Rwanda	12	9.0	12	10.4			RISE	
9	Senegal	30	20.6	34	21.9			RISE	
10	South Africa			9	15.4	9	17.7		RISE
11	Sudan					25	9.9		
12	Tanzania			26	14.1				
13	Uganda			4	5.2				
				56	14.6				
14	Zambia	10	20.2	10	18.3			FALL	
				72	29.0				
15	Zimbabwe			10	28.9				
Asia									
1	Bhutan					20	32.7		
2	Cambodia			24	11.7	24	13.6		RISE
				149	18.0				
3	China			31	6.2				
4	India	35	3.3	35	4.1			RISE	
				593	7.5				
5	Indonesia	7	4.2	7	4.1			STABLE	
		26	8.2	26	8.4	33	12.9	STABLE	RISE
6	Iraq			15	8.3				
7	Kyrgyz Rep.			52	19.2				
8	Malaysia	15	19.8	15	20.7			STABLE	
9	Mongolia	21	21.9	21	20.2			FALL	
10	Nepal			74	14.1				
11	Philippines	16	11.7						
		77	14.9						
12	Thailand	73	14.0	76	17.0			RISE	
13	Turkey	61	23.5	61	27.0			RISE	
Europe									
1	Armenia			11	13.7				
2	Belarus			6	10.7				
3	France	22	23.9	22	25.5	26	26.2	RISE	STABLE
				101	39.8				
4	Ireland			8	19.9	8	21.2		RISE
5	Portugal	7	13.2	7	12.8			STABLE	
		22	18.9	22	18.8			STABLE	
		308	28.8						
6	Romania			4	7.7				
		8	13.6	8	11.6			FALL	
				42	16.5				
7	Spain	52	22.7	52	22.4			STABLE	
				366	44.8				
		8,108	46.6						
8	Slovenia			2	6.6				
				12	13.0				
Latin America and Caribbean									
1	Antigua &	8	28.6	8	28.4			STABLE	

	Barbuda								
2	Argentina	24	15.0	24	19.9			RISE	
3	Barbados	11	29.9	11	31.1			STABLE	
4	Belize	6	14.2	6	14.2			STABLE	
5	Bolivia	9	13.8	9	15.2			RISE	
		111	25.0	112	26.3			RISE	
6	Brazil	5	9.4	5	10.1			RISE	
		27	14.8	27	15.4			STABLE	
		1540	36.0	1520	37.5			STABLE	
7	Chile	13	20.6	13	21.3			STABLE	
		44	27.9	44	29.7			RISE	
				338	49.6				
8	Colombia	10	16.6						
		33	22.8			33	20.3		
						532	32.5		
		1104	40.0			1105	36.2		
9	Costa Rica			7	20.0	7	19.9		STABLE
				60	34.0				
				81	34.2	81	33.3		STABLE
10	Cuba			15	15.2				
				169	28.1				
11	Ecuador	22	19.4	22	20.2			STABLE	
		117	27.9	128	30.3			RISE	
12	El Salvador	14	16.7			14	16.0		
		261	22.9			262	23.8		
13	Guatemala	22	10.8	22	11.1			STABLE	
		330	16.9	327	20.0			RISE	
14	Honduras	18	19.5	18	17.2			FALL	
		289	23.8	298	23.3			STABLE	
15	Jamaica	14	25.4	14	27.2			RISE	
16	Nicaragua			17	13.3				
				153	19.6				
17	Panama			11	20.6				
				75	34.5				
18	Paraguay	18	26.1	18	26.4			STABLE	
		227	31.7	236	35.1			RISE	
19	Peru	25	22.4			25	19.6		
						1833	34.9		
20	Saint Lucia			12	18.5				
21	Uruguay	19	24.5	19	24.1			STABLE	
22	Venezuela	23	23.1	24	23.8			STABLE	
North America									
1	Canada			13	15.6				
2	Mexico	32	17.3	32	18.5	32	19.3	RISE	STABLE
3	USA			4	17.8				
		9	23.5	9	23.3	9	23.3	STABLE	STABLE
		51	31.9	51	31.6	51	31.6	STABLE	STABLE
Oceania									
1	Vanuatu					6	17.2		
TOTAL (no. of countries)			**36**		**49**		**15**		

Source: Authors' calculations, based on data in IMAGE Inventory of Internal Migration Available from http://www.gpem.uq.edu.au/image (accessed January 2013).

[1] STABLE is defined as a change of less than ± 5 per cent

E. GLOBAL ESTIMATES OF INTERNAL MIGRATION

Bell and Muhidin (2009), computed global estimates of internal migration by taking the population-weighted average of migration intensities across four broad regions of the world, using data for the 28 countries at their disposal. With the benefit of the additional national datasets now available, table 9 provides revised and updated figures for both five-year and life-time migration, combining data from the 2000 and 2010 rounds of censuses, with discrete

estimates for each continent. The intensities are calculated for movements between major regions, usually the first level administrative sub-division of each country, and while these differ widely in number and size, they generally correspond to relatively longer distance moves. These averages are then applied to the 2005 mid-year population estimates for each continent as reported in the United Nations World Population Prospects, the 2010 Revision. Results are shown in table 9 alongside the estimates produced by Bell and Muhidin (2009).

TABLE 8. COURGEAU'S *K*, LIFETIME MIGRATION INTENSITY BY COUNTRY AND TYPE OF REGION, 1990, 2000 AND 2010 ROUNDS OF CENSUSES

	Country	1990		2000		2010		Trend	
		k	r^2	K	r^2	k	r^2	1990-2000	2000-2010
Africa									
1	Ghana			3.13	0.72				
2	Kenya	2.51	0.46	2.52	0.81			STABLE[1]	
3	Uganda			1.82	1.00				
4	Zambia			3.52	0.90				
Asia									
1	Cambodia			1.81	1.00				
2	India			0.59	1.00				
3	Indonesia	1.21	0.96	1.22	0.93			STABLE	
4	Philippines	1.83	0.28						
Europe									
1	France			4.21	0.97				
2	Portugal	2.70	0.87	2.83	0.98			STABLE	
3	Romania			2.39	0.85				
4	Spain	2.64	0.99	3.49	0.84			RISE	
5	Slovenia			2.77	0.59				
Latin America and Caribbean									
1	Bolivia	2.75	0.94	2.91	0.88			RISE	
2	Brazil	2.44	0.99	2.55	0.99			STABLE	
3	Chile	3.79	0.93	4.16	0.99			RISE	
4	Colombia	2.99	0.95			2.62	0.97		
5	Costa Rica			4.12	0.85	4.00	0.75		FALL
6	Cuba			5.50	1.00				
7	Ecuador	2.99	0.97	3.17	0.99			RISE	
8	El Salvador					2.30	0.41		
9	Guatemala	1.52	0.87	1.74	1.00			RISE	
10	Honduras			2.57	0.88				
11	Nicaragua			2.04	0.80				
12	Panama			4.06	0.98				
13	Paraguay			3.51	0.22				
14	Peru					2.43	0.85		
North America									
1	USA	4.37	0.30	4.57	0.37	4.50	0.42	STABLE	FALL
TOTAL (no. of countries)			**12**		**23**		**5**		

Source: Authors' calculations, based on data in IMAGE Inventory of Internal Migration Available from http://www.gpem.uq.edu.au/image (accessed January 2013).

[1] STABLE is defined as a change of less than ± 5 per cent

It was estimated that in 2005, globally, 229 million people were living within the same country, but in a different region to five years before. This is 5 million less than the estimates of Bell and Muhidin (2009). The reduction is due entirely to a downward adjustment in the number of internal migrants in the more developed regions of the world, partly offset by an upward adjustment to the numbers in Asia, Africa and Latin America and the Caribbean. We

further estimate that 763 million people were living outside of their region of birth in 2005. This is an upward revision of 23 million from the 2009 figure. Underpinning this change was an upward adjustment of around 10 million migrants in Africa and 75 million in Asia, counteracted by a substantial downward revision in the number of lifetime migrants in the more developed regions. These estimates remain preliminary and are subject to future revisions as more data become available.[3] Notwithstanding, the estimates presented here and those in Bell and Muhidin (2009), appear to provide a consistent picture of the overall intensity of inter-regional migration within countries around the world. Set alongside the estimate of some 214 million international migrants, i.e., the number of people living outside their country of birth (United Nations, 2009), the figures given serve to underline the significance of migration within countries as a fundamental process of social and demographic change.

TABLE 9. GLOBAL ESTIMATES OF THE NUMBER OF INTERNAL MIGRANTS IN 2005, FIVE-YEAR AND LIFETIME DATA

	Previous Estimates[1]			**Updated estimates**			
Region	**PAR[2] (millions)**	**Migrants (millions)**	**Intensity**	**PAR (millions)**	**Migrants (millions)**	**Intensity**	**Number of countries**
			5 year				
Africa	860.7	32.9	4.0	865.6	39.7	4.6	4
Asia	3,724.9	96.2	2.7	3,747.7	109.8	2.9	10
Latin America and the Caribbean	531.1	18.7	3.7	529.2	21.9	4.1	16
Europe				694.2	34.8	5.0	3
North America				312.8	21.2	6.8	3
Oceania				31.9	1.8	5.7	3
More developed regions	1,150.5	87.8	8.1				
Global	**5,937.0**	**235.7**	**3.7**	**6,181.3**	**229.2**	**3.7**	**39**
			Lifetime				
Africa[3]	860.7	104.1	12.8	911.1	113.5	12.5	13
Asia	3,724.9	207.8	5.9	3,945.0	282.1	7.2	14
Latin America and the Caribbean	531.1	101.6	20.2	557.0	100.2	18.0	23
Europe				730.7	166.0	22.7	10
North America				329.2	91.5	27.8	6
Oceania				33.5	9.3		
More developed regions	1,150.5	326.3	29.9				
Global	**5,937.0**	**739.9**	**12.5**	**6,506.6**	**762.6**	**11.7**	**66**

[1] Source: Bell and Muhidin (2009).
[2] PARs are calculated as 95 per cent of the 2005 mid-year population.
[3] Zambia and Zimbabwe not included in calculation for lifetime migrants in Africa.

F. THE SPATIAL IMPACT OF MIGRATION

Table 10 sets out Migration Effectiveness Indices (MEI) and Aggregate Net Migration Rates (ANMR) for the 22 countries for which data were available for the five-year migration interval at the 1990 round of censuses; 29 countries for which data were available at the 2000 round of censuses, and for 11 countries for the 2010 round. The MEI captures the degree of asymmetry in a system of interzonal migration flows and hence the effectiveness of migration

[3] The regional population representation of the countries with census data for these calculations is reasonably good in Northern America, Latin America, Asia and Oceania, which together account for nearly three quarters of the 6.9 billion world population in 2010, but is not very good in Europe and Africa, which account for the remaining quarter of the world population.

in redistributing population within a settlement system. The value of the MEI ranges between 0 and 100, with high values indicating that migration is acting as an effective mechanism for population redistribution, while low values signify a more balanced system in which flows are largely balanced by counterflows, and little net redistribution is occurring[4]. The ANMR provides a more direct measure of the overall impact of migration in changing the pattern of human settlement within a country, by capturing the net redistribution of population relative to the base population in each region. The ANMR is computationally equivalent to the product of the CMI and the MEI (divided by 100)[5]. Bell and others (2002), provide a comprehensive discussion of the two measures as indicators of the spatial impact of migration.

Focusing first on migration effectiveness at the 2000 round of censuses, the results reveal *substantial* variation between countries. Ecuador, China and Viet Nam emerge as the countries in which migration displays the highest degree of asymmetry between inter-regional migration flows. In Ecuador, for every 100 migrants crossing a provincial boundary, there was a net redistribution of 63 people from one province to another. The figures were only slightly lower for China and Viet Nam with MEIs of 62 per cent and 60 per cent, respectively, at the province and regional level. The figures in other parts of the world are substantially lower with most countries registering MEIs in the high teens or twenties. For our sample of countries in Asia, migration effectiveness is generally at the upper end of this range, while for Latin America they are at the lower end. The more developed countries, as well, display relatively low levels of migration effectiveness.

Examining trends over time, what stands out is the high degree of volatility in migration effectiveness in several countries. In China, Malaysia and Viet Nam, the MEI almost doubled between the 1990 and 2000 rounds of censuses, and the same was true of Ecuador. Indonesia, on the other hand, registered a sharp reduction over the period, as did Barbados, Mexico and Australia. Elsewhere, migration effectiveness was generally more subdued and the general trend was falling, but the dominant impression from table 10, is of volatility, suggesting that major shifts may often occur in the overall pattern and balance of migration flows over relatively short intervals.

Values of the ANMR are consistently lower than the MEI, because the total population of the country (the population at risk) replaces gross migration flows as the denominator in the calculation. However, the ratio between the two values is not consistent over space or

[4] Computationally, $MEI=100\left\{\sum_i \left|D_i-O_i\right| / \sum_i \left(D_i+O_i\right)\right\}$ where D_i is the total inflows to zone i and O_i is the total outflows from zone i

[5] Computationally, $ANMR=100(\sum_i \left|D_i-O_i\right| / \sum_i P_i)$ where P_i is the population at risk in region i

time, because the relationship is mediated by migration intensity. Thus, according to the 2000 round of censuses, Greece and Bolivia (112 regions) displayed similar levels of migration effectiveness, but the ANMR for Bolivia is significantly higher because, as shown in table 5, it has a much greater level of migration intensity (10 per cent compared with 6 per cent). The ANMR is an important measure of migration impact because it captures the overall effect, which is exerted by migration in shifting the pattern of human settlement between regions within a country. As with all conventional migration indicators, however, results vary for different levels of spatial aggregation.

As shown in table 10, for the countries in our sample, the ANMR ranged from a high of 4.2 per cent for the 21 Aimags of Mongolia to a low of just 0.1 per cent for the seven major regions of Indonesia in 2000. In 21 of the 31 countries for which data was available in the 2000 round of censuses, the ANMR exceeded 1 per cent, and in eight of these the value was 2 per cent or more at one or more levels of spatial scale. Thus, over the five-year period, internal migration redistributed 2 per cent or more of the national population between the cantons of Ecuador (128) and Costa Rica (60), municipalities of Chile (178) and the Dominican Republic (225), districts of Malaysia (133) and Paraguay (236), provinces of Bolivia (112), as well as between the 21 Aimags of Mongolia noted above. The heavy representation of Latin America and the Caribbean countries in this list is notable, but is by no means a consistent regional pattern: both Brazil and Argentina recorded much lower levels of redistribution. Similarly, the Asian and African representatives in table 10 display mixed outcomes. In the more developed countries, on the other hand, ANMRs are generally at the lower end of the scale, despite their relatively high migration intensities: high mobility in the United States of America, Australia, New Zealand and Canada therefore appears to be largely absorbed in reciprocal movements, generating more modest levels of population redistribution. While more data would be needed for a comprehensive test, there does seem to be some evidence that spatial redistribution declines with advancing development.

Another feature notable from table 10 is that both migration effectiveness and redistribution tend to increase at finer levels of spatial scale. Of the 18 countries for which data are available at more than one geographic level in the 2000 round of censuses, 17 display consistently higher values for the MEI and the ANMR as the number of regions over which migration is measured increases. Data from the 1990 and 2010 rounds deliver a similar result. Internal migration therefore appears to be generating considerable population redistribution at lower geographic levels, even where regional population shares are remaining in closer equilibrium.

MEIs calculated on the basis of lifetime migration are substantially higher than their five year counterparts (table 11), demonstrating that, cumulatively, migration is more effective as a process of redistribution than the data for the five-year interval would suggest. The numbers for many countries are striking, with effectiveness indices around 50 per cent or

more in half of our sample countries at some geographic level. Cumulatively, this implies that fully half of all lifetime migrations generated a net relocation from one province to another. Even in those countries which registered relatively low MEIs, the figures are still remarkably high, falling below 25 per cent in only one country, Zimbabwe. Given both the higher levels of intensity and greater migration effectiveness, ANMRs are unsurprisingly also much higher for lifetime than for five-year mobility. In 2000, Spain recorded the highest ANMR of 18 per cent for migration between 366 regions. Of the 50 countries for which data are available in the 2000 round of censuses, fully 80 per cent registered lifetime ANMRs in excess of 5 per cent, and for 11 countries, the figure exceeded 10 per cent. That is to say, migrations out of their regions of birth had effectively redistributed 1 in 10 or more of the population to other regions of the same country. Once again, it is Latin America and the Caribbean that stands out with a large number of countries—proportionately more than in any other major world region—recording ANMRs in excess of 10 per cent, underscoring the considerable transformative effect of migration on settlement patterns in this part of the world.

TABLE 10. FIVE-YEAR MIGRATION EFFECTIVENESS INDEX AND AGGREGATE NET MIGRATION RATE BY COUNTRY AND TYPE OF REGION, 1990, 2000 AND 2010 ROUNDS OF CENSUSES

		1990			2000			2010			Trend (MEI)		Trend (ANMR)	
	Country	**No. of Regions**	**MEI**	**ANMR**	**No. of Regions**	**MEI**	**ANMR**	**No. of Regions**	**MEI**	**ANMR**	**1990-2000**	**2000-2010**	**1990-2000**	**2000-2010**
Africa														
1	Ghana				10	15.7	0.6							
					110	22.7	1.4							
2	Mauritius				14	9.7	0.5							
3	Senegal				11	17.0	0.6							
		30	31.2	1.8	34	23.8	1.9				FALL		STABLE[1]	
4	South Africa				9	33.9	1.4							
Asia														
1	China	30	32.2	0.4	31	62.4	1.7				RISE		RISE	
2	Indonesia	7	20.0	0.2	7	9.4	0.1				FALL		FALL	
		26	30.8	0.9	26	19.8	0.4	33	33.5	0.8	FALL	RISE	FALL	RISE
					280	23.8	0.9							
3	Malaysia	15	15.3	1.1	15	28.6	1.4				RISE		RISE	
					133	33.3	2.7							
4	Mongolia				21	49.0	4.2							
5	Nepal				74	44.2	1.4							
6	Philippines				16	26.2	0.7							
					83	24.0	0.8							
7	Vietnam	8	36.5	0.9	8	59.7	1.2				RISE		RISE	
		61	35.1	1.2	61	49.9	1.5	63	58.2	2.5	RISE	RISE	RISE	RISE
Europe														
1	Greece	54	23.1	1.3	54	23.2	1.4				STABLE		RISE	
2	Portugal	7	11.3	0.2	7	10.0	0.2				FALL		FALL	
		22	17.6	0.5	22	16.3	0.5				FALL		STABLE	
Latin America and Caribbean														
1	Argentina				24	15.0	0.5							
2	Barbados	11	26.1	1.8	11	16.9	1.1				FALL		FALL	
3	Bolivia	9	23.8	1.3	9	28.8	1.7				RISE		RISE	
					112	22.9	2.3							
4	Brazil	5	23.8	0.5	5	23.3	0.5				STABLE		STABLE	
		27	25.6	1.0	27	17.7	0.6				FALL		FALL	
5	Chile	13	8.6	0.6	13	7.2	0.5				FALL		FALL	
		44	12.3	1.2	44	17.1	1.6				RISE		RISE	
					178	18.1	3.0							
6	Colombia	10	15.0	0.9										
		31	18.9	1.5				33	17.8	0.8				

		529	23.3	3.1				532	24.3	1.6				
7	Costa Rica				7	14.6	0.8	7	15.6	0.9		RISE		RISE
					60	16.6	1.8							
8	Dominican Republic				9	25.2	1.1							
					225	35.4	2.3							
9	Ecuador	22	27.6	1.7	22	63.3	3.5				RISE		RISE	
		117	24.4	2.1	128	29.0	2.4				RISE		RISE	
10	Honduras	18	34.7	1.7	18	31.9	1.4				FALL		FALL	
					298	26.5	1.6							
11	Nicaragua				17	33.6	1.2	17	21.1	0.5		FALL		FALL
					145	33.9	1.8	153	22.8	0.9		FALL		FALL
12	Paraguay	18	36.5	3.3	18	25.0	1.9				FALL		FALL	
					236	21.6	2.5							
13	Peru	25	28.7	2.5				25	29.7	1.6				
								1833	25.4	3.0				
14	Uruguay	19	21.2	1.6	19	22.9	1.5				RISE		FALL	
15	Venezuela				24	26.3	1.3							
North America														
1	Canada	11	16.7	0.7	11	18.9	0.6				RISE		FALL	
								288	15.0	1.7				
2	Mexico	32	33.6	1.6	32	28.4	0.8	32	13.8	0.3	FALL	FALL	FALL	FALL
3	USA				4	14.8	0.7							
		9	17.1	1.2	9	15.1	1.0				FALL		FALL	
		51	15.6	1.5	51	13.1	1.2				FALL		FALL	
Oceania														
1	Australia	8	19.0	1.0	8	11.7	0.6	8	10.7	0.5	FALL	FALL	FALL	FALL
		38	12.0	2.0	38	8.3	1.2				FALL		FALL	
		69	11.6	2.1	69	7.7	1.3	88	7.2	1.1	FALL	FALL	FALL	FALL
								333	8.6	1.8				
2	New Zealand				14	7.0	0.8	16	7.8	0.9	RISE		RISE	
					74	7.0	1.4	73	7.6	1.6	RISE		RISE	
3	Vanuatu							6	39.9	2.9				
TOTAL (no. of countries)				**22**			**29**			**11**				

[1] STABLE is defined as a change of less than ±5 per cent

TABLE 11. LIFETIME MIGRATION EFFECTIVENESS INDEX AND AGGREGATE NET MIGRATION RATE BY COUNTRY AND TYPE OF REGION, 1990, 2000 AND 2010 ROUNDS OF CENSUSES

		1990			2000			2010			Trend (MEI)		Trend (ANMR)	
	Country	**No. of Regions**	**MEI**	**ANMR**	**No. of Regions**	**MEI**	**ANMR**	**No. of Regions**	**MEI**	**ANMR**	**1990-2000**	**2000-2010**	**1990-2000**	**2000-2010**
	Africa													
1	Egypt				27	44.0	3.3	27	60.0	4.1		RISE		RISE
2	Ghana				10	45.2	8.0							
3	Guinea				34	49.4	7.8							
4	Kenya	8	58.4	7.4	8	57.7	7.3				STABLE[1]		STABLE	
		41	46.4	8.1	69	45.9	9.3				STABLE		RISE	
5	Mali	47	36.1	4.8	47	29.6	3.4							
6	Malawi	24	28.8	5.4										
7	Rwanda	12	45.9	4.1	12	50.3	5.2				RISE		RISE	
8	Senegal	30	34.0	7.0	34	32.8	7.2				STABLE		STABLE	
9	South Africa				9	45.7	7.0	9	47.2	8.4			STABLE	RISE
10	Sudan							25	54.8	5.4		RISE		RISE
11	Tanzania				26	37.8	5.3							
12	Uganda				4	57.8	3.0							
					56	44.7	6.5				FALL		FALL	
13	Zambia	10	28.1	8.2	10	24.2	4.4							
					72	28.1	8.2							
14	Zimbabwe				10	18.7	5.3							
	Asia													
1	Bhutan							20	37.1	12.1				
2	Cambodia				24	50.8	5.9	24	58.2	7.9		RISE		RISE
					149	48.9	8.8							
3	China				31	44.9	2.8							
4	India	35	33.1	1.1	35	35.4	1.5				RISE		RISE	
5	Indonesia	7	49.8	2.1	7	36.7	1.5				FALL		FALL	
		26	51.8	4.2	26	48.5	4.1	26	48.5	4.1	FALL	STABLE	STABLE	STABLE
6	Iraq				15	41.1	3.4							
7	Kyrgyz Rep.				52	45.1	8.7							
8	Malaysia	15	39.7	8.2	15	39.7	8.2				STABLE		STABLE	
9	Mongolia	21	65.5	14.4	21	66.2	13.4				STABLE		FALL	
10	Nepal				74	56.6	8.0							
11	Philippines	16	47.3	5.5										
		77	48.4	7.2										
12	Thailand	73	41.0	5.8	76	44.3	7.5				RISE		RISE	
13	Turkey	61	58.5	13.7	61	58.3	15.8				STABLE		RISE	
	Europe													
1	Armenia				11	49.7	6.8							

2	Belarus				6	37.5	4.0							
3	France	22	18.2	4.4	22	15.9	4.0				FALL		FALL	
4	Ireland				8	22.9	4.5	8	28.0	6.0		RISE		RISE
5	Portugal	7	11.3	0.2	7	55.9	7.2				RISE		RISE	
		22	17.6	0.5	22	47.6	8.9				RISE		RISE	
6	Romania				4	35.3	2.7							
		8	47.6	6.5	8	44.2	5.1				FALL		FALL	
					42	38.2	6.3							
7	Spain	52	51.1	11.6	52	45.6	10.2				FALL		FALL	
					366	39.0	17.5				RISE		RISE	
8	Slovenia				2	56.0	3.7							
					12	31.5	4.1							
	Latin America and the Caribbean													
1	Antigua & Barbuda	8	31.7	9.1	8	38.4	10.9				RISE		RISE	
2	Argentina	24	56.4	8.4	24	40.0	8.0				FALL		FALL	
3	Barbados	11	29.7	8.9	11	33.4	10.4				RISE		RISE	
4	Belize	6	17.8	2.5	6	22.5	3.2				RISE		RISE	
5	Bolivia	9	39.8	5.5	9	45.3	6.9				RISE		RISE	
		111	46.0	11.5	112	43.9	11.5				STABLE		STABLE	
6	Brazil	5	55.5	5.2	5	57.1	5.7				STABLE		RISE	
		27	49.6	7.4	27	48.5	7.5				STABLE		STABLE	
7	Chile	13	38.6	8.0	13	35.7	7.6				FALL		STABLE	
		44	31.5	8.8	44	29.0	8.6				FALL		STABLE	
8	Colombia	10	38.8	6.4										
		33	39.3	8.8				33	34.2	6.9				
								532	39.5	12.9				
9	Costa Rica				7	22.7	4.5	7	19.9	21.5		FALL		RISE
					60	29.8	10.1							
10	Cuba				15	49.8	15.2							
					169	34.5	9.7							
11	Ecuador	22	54.7	10.6	22	53.8	10.9				STABLE		STABLE	
		117	45.1	12.6	128	43.3	13.1				STABLE		STABLE	
12	El Salvador	14	54.0	9.0				14	40.6	6.5				
		261	44.2	10.1				262	40.9	9.8				
13	Guatemala	22	49.3	5.3	22	44.4	4.9				FALL		FALL	
		330	41.0	7.0	327	48.3	9.7				RISE		RISE	
14	Honduras	18	40.1	11.0	18	43.6	7.5				RISE		FALL	
		289	40.9	9.8	298	39.4	9.2				STABLE		FALL	
15	Jamaica	14	46.9	11.9	14	44.8	12.2				STABLE		STABLE	
16	Nicaragua				17	40.5	5.4							
					153	34.0	6.6							
17	Panama				11	59.4	12.2							
					75	39.5	13.6							
18	Paraguay	18	48.1	12.6	18	51.2	13.5				RISE		RISE	

		227	53.0	16.8	236	47.3	16.6				FALL		STABLE	
19	Peru	25	49.1	11.0				25	53.6	10.5				
								1833	47.6	16.6				
20	Saint Lucia				12	30.4	5.6							
21	Uruguay	19	48.2	11.8	19	44.5	10.7							
22	Venezuela	23	36.4	8.4	24	39.8	9.5							
	North America													
1	Mexico	32	40.6	7.0	32	46.5	8.6	32	45.3	8.4	RISE	STABLE	RISE	STABLE
2	USA				4	35.6	6.4							
		9	31.5	7.4	9	29.0	6.9	9	28.9	6.7	FALL	STABLE	FALL	STABLE
		51	28.6	9.1	51	26.1	8.3	51	26.1	8.2	FALL	STABLE	FALL	STABLE
	Oceania													
1	Vanuatu							6	55.9	9.6				
	TOTAL (no. of countries)				**35**			**49**		**15**				

[1] STABLE is defined as a change of less than ±5 per cent

G. CONCLUSIONS

This paper has reported results of a cross-national comparison of internal migration for 70 countries, undertaken as part of the IMAGE project, an international collaborative programme of research designed to investigate the way in which internal migration—the propensity to change residence within national borders—varies between countries around the world. Specifically, the paper aimed to update and extend the analysis originally reported by Bell and Muhidin (2009) for the United Nations *Human Development Report 2009*. It drew first on the IMAGE inventory of internal migration data collections to summarise the types of data which are collected. It then utilised data sets held in the IMAGE repository to examine trends in migration intensity and in the spatial impact of migration using five-year and lifetime migration data, drawn from the 1990, 2000 and 2010 rounds of censuses. The paper employed three measures of migration, as defined by Bell and others (2002), which are functionally related—the Crude Migration Intensity, Migration Effectiveness Index and Aggregate Net Migration Rate. To harmonise for differences between countries in the number of regions across which migration is measured, Courgeau's *k* (Courgeau, 1973) was also computed.

The results reveal significant spatial heterogeneity in both five-year and lifetime migration intensities. Broadly speaking, migration intensities are highest in the new world countries of Australia, Canada, New Zealand and the United States of America, and lowest in Asia. Intensities in Europe, Latin America and Africa stand at intermediate levels, but with considerable intra-regional diversity. Thus, five-year migration intensities were high in Chile and South Africa, but low in Ghana and Argentina. Lifetime migration intensities, which capture changes in residence within a country since birth, are systematically higher than the five-year figures and, in many cases, reveal a remarkable level of mobility. Thus, 9 countries were identified of the 54 collecting this form of migration data and for which information was available in the IMAGE data repository, and in which 30 per cent or more of the population were living outside their region of birth at the time of the 2000 round of censuses. While countries such as Chile, with 50 per cent of the population living outside their municipality of birth, are exceptional, only in a few isolated cases does the figure for lifetime inter-regional migration fall below 10 per cent.

Comparing migration intensities measured sequentially across the 1990, 2000 and 2010 rounds of censuses, the dominant impression from the five-year data is a trend of declining migration intensities across the globe. Between the 1990 and 2000 census rounds, five-year intensities fell in Asia, Latin America and the Caribbean, North America and Oceania, with only isolated increases apparent in parts of Africa and Europe. China is the most striking exception to the general pattern, characterised by a sharp increase in inter-provincial migration during the 1990s. Data revealing trends since 2000 are more limited but generally confirm the continuing fall in migration intensities, except in Indonesia and Viet Nam, each

of which registered a rise. Lifetime migration data reveal a very different picture, with intensities stable or rising across the three rounds of censuses throughout much of the world. This converse trend almost certainly reflects the inherent inertia in lifetime data, and the fact that migrations inevitably accumulate as populations age. A slowing, or incipient reversal, in lifetime intensities in Europe and North America may in turn be linked to rising return migration to regions of birth at older ages.

At a global level, it was estimated that in 2005, 229 million people were living within their country of birth but in a different region to five years earlier. This figure is five million less than previously estimated by Bell and Muhidin (2009). The reduction in the global figure reflects more robust estimates based on data for a broader sample of countries. It was further estimated that 763 million people were living within their own country, but outside their region of birth in 2005. This is an upward revision of almost 23 million from the 2009 estimate, again based on a broader data set. Lifetime migration intensities appear to be highest in Europe and North America and lowest in Asia. These estimates remain preliminary and subject to future revisions as more data becomes available, but set alongside the estimate of 214 million international migrants (the number of people living outside their country of birth) (Bell and Muhidin, 2009), the figure of 763 million internal migrants underlines the significance of migration within countries as a fundamental process of social and demographic change.

High migration intensities do not necessarily bring about significant changes in population distribution because a large proportion of migration is offset by counterflows in the reverse direction. Measured over a five-year period, the countries in our sample generally displayed migration effectiveness indices around 15 to 30 per cent, with the more developed countries and Latin America and the Caribbean at the lower end of the range, and Asian countries displaying higher indices. There is also striking evidence of outliers with Ecuador, Viet Nam and China all recording MEIs of 60 per cent or more in the 2000 round of censuses, reflecting highly asymmetrical migration flows. Migration effectiveness appears to be highly volatile, often reflecting short-term fluctuations in inter-regional migration patterns. Nevertheless, coupled with often high migration intensities, the results demonstrate that internal migration exerts a substantial effect on the pattern of human settlement. In 21 of the 31 countries for which data are available in the 2000 round of censuses, internal migration redistributed 1 per cent or more of the national population to other regions within a five-year period, and in 8 of these, the figure was above 2 per cent. Lifetime migration data provide an even more striking picture, with population redistribution exceeding 5 per cent in four out of five countries for which data was available, and exceeding 10 per cent in the case of one country in every five.

As the IMAGE project acquires data for other countries and time periods, it will become possible to progressively extend this analysis of cross-national variations and

temporal trends in internal migration, and assess their causes and impacts. At the time of writing, the IMAGE repository holds internal migration data for some 99 countries, in many cases spanning a large number of years. In building a global picture, however, analysis will increasingly need to confront the difficulties of harmonising datasets, which measure migration in differing ways. From the information assembled in the IMAGE inventory, and summarised in table 1 of this paper, it is apparent that the large group of data sets which capture information on the “latest move”, without any clear reference period, will present the greatest challenge.

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APPENDIX A

MICRO-DATA SAMPLE SIZES, BY COUNTRY AND ROUND OF CENSUSES

Region	Country	1990 Census Round			2000 Census Round			2010 Census Round		
		Year	Source	Sample Size %	Year	Source	Sample Size %	Year	Source	Sample Size%
Africa										
1	Botswana				2001	NSA+	100			
2	Egypt				1996	IPUMS	10	2006	IPUMS	10
3	Ghana				2000	IPUMS	10			
4	Guinea				1996	IPUMS	10			
5	Kenya	1989	IPUMS	5	1999	IPUMS	5			
6	Malawi	1987	IPUMS	10						
7	Mali	1987	IPUMS	10	1998	IPUMS	10			
8	Mauritius				2000	NSA				
9	Rwanda	1991	IPUMS	10	2002	IPUMS	10			
10	Senegal	1988	IPUMS	10	2002	IPUMS	10			
11	South Africa				2001	IPUMS	10	2007	IPUMS	2
12	Sudan							2008	IPUMS	15
13	Tanzania				2002	IPUMS	10			
14	Uganda				2001	IPUMS	10			
15	Zambia	1990	NSA	100	2000	NSA	100			
16	Zimbabwe				2002	NSA	100			
Asia										
1	Bhutan							2005	NSA	100
2	Cambodia				1998	IPUMS	10	2008	IPUMS	10
3	China	1990	IPUMS	1	2000	NSA				
4	India	1991	NSA	100	2001	NSA	100			
5	Indonesia	1990	IPUMS	0.5	2000	IPUMS	10	2010	IPUMS	10
6	Iraq				1997	IPUMS	10			
7	Japan							2010	NSA	100
8	Kyrgyz Rep.				1999	IPUMS	10			
9	Malaysia	1991	IPUMS	2	2000	IPUMS	2			
10	Mongolia	1989	IPUMS	10	2000	IPUMS	10			
11	Nepal				2001	IPUMS	11.35			
12	Philippines	1990	IPUMS	10	2000	IPUMS	10			
13	Thailand	1990	IPUMS	1	2000	IPUMS	1			
14	Vietnam	1989	IPUMS	5	1999	IPUMS	3	2009	IPUMS	15
15	Turkey	1990	IPUMS	5	2000	IPUMS	5			
Europe										
1	Armenia				2001	IPUMS	10			
2	Belarus				1999	IPUMS	10			
3	France	1990	IPUMS	4.2	1999	IPUMS	5	2006	IPUMS	33
4	Greece	1991	IPUMS	10	2001	IPUMS	10			
5	Ireland				2002	IPUMS	10	2006	IPUMS	10
6	Portugal	1991	IPUMS	5	2001	IPUMS	5			
7	Romania	1992	IPUMS	10	2002	IPUMS	10			
8	Slovenia				2002	IPUMS	10			
9	Spain	1991	IPUMS	5	2001	IPUMS	5			

10	Switzerland	1990	IPUMS	5	2000	IPUMS	5			
Latin America and the Caribbean										
1	Antigua and Barbuda	1991	CELADE	100	2001	CELADE	100			
2	Argentina	1991	IPUMS	10	2001	CELADE	100			
3	Barbados	1990	CELADE	100	2000	CELADE	100			
4	Belize	1990	CELADE	100	2000	CELADE	100			
5	Bolivia	1992	CELADE	100	2001	CELADE	100			
6	Brazil	1991	CELADE	100	2000	CELADE	100			
7	Chile	1992	CELADE	100	2002	CELADE	100			
8	Colombia	1993	CELADE	100				2005	CELADE	100
9	Costa Rica				2000	CELADE	100	2011	NSA	100
10	Cuba				2002	CELADE	100			
11	Dominican Rep.				2002	CELADE	100			
12	Ecuador	1990	CELADE	100	2001	CELADE	100			
13	El Salvador	1992	CELADE	100				2007	CELADE	100
14	Guatemala	1994	CELADE	100	2002	CELADE	100			
15	Honduras	1988	CELADE	100	2001	CELADE	100			
16	Jamaica	1991	IPUMS	10	2001	IPUMS	10			
17	Nicaragua	1995	CELADE	100				2005	CELADE	100
18	Panama				2000	CELADE	100			
19	Paraguay	1992	CELADE	100	2002	CELADE	100			
20	Peru	1993	CELADE	100				2007	CELADE	100
21	Saint Lucia				2001	CELADE	100			
22	Uruguay	1985	CELADE	100	1996	CELADE	100			
23	Venezuela	1990	CELADE	100	2001	CELADE	100			
North America										
1	Canada	1991	IPUMS	3	2001	NSA	100	2006	NSA	100
2	Mexico	1995	IPUMS	0.4	2000	CELADE	100	2005	IPUMS	10
3	USA	1990	IPUMS	5	2000	IPUMS	5	2005	IPUMS	1
Oceania										
1	Australia	1991	NSA	100	2001	NSA	100	2011	NSA	100
2	New Zealand							2006	NSA	100
3	Vanuatu							2009	NSA	100

GLOSSARY

Measures for cross-national comparison of internal migration used in this paper

Indicator Name	*Abbreviation*	*Description*
Measures of migration intensity		
Crude Migration Intensity	CMI	Total moves over population at risk
Measures of migration distance		
Courgeau's Index k	*k*	Slope of CMIs at various regional scales
Measures of migration connectivity		
Migration Effectiveness Index	MEI	Asymmetry of inter-zonal migration flows
Aggregate Net Migration Rate	ANMR	Extent of redistribution through migration

Source: Adapted from Bell and Muhidin (2009), table 2; mathematical formulas are given in the text.