Internal Migration Levels and Patterns in Europe: A Cohort Perspective

Abstract

Europe displays important variations in the level of internal migration, with a spatial gradient of high mobility in the North and West falling steadily to the South and East. At the same time, there is great diversity across the region in migration trends with some countries registering stability or decline, while rising migration rates are found in other countries. The dynamics of population mobility, and ultimately cross-national variations, remain, however, poorly understood because they are almost exclusively analysed with cross-sectional data and period measures. This paper seeks to advance understanding of internal migration in two ways. Methodologically, it proposes ten cohort-based measures of completed migration, migration timing, migration spacing, parity distribution and parity distribution ratios that can be used to systematically quantify migration levels and patterns across countries and over time. Substantively, it applies the proposed measures to internationally comparable retrospective survey data for 14 European countries that provide residential histories from age 17 to 50 of successive cohorts born between 1918 and 1957. The analysis reveals enduring cross-national variations in migration levels that have persisted across cohorts and shows that these variations are underpinned by the extent of repeat movement and the age at first move.

Background

Cross-national variations in migration levels and trends are now well-documented in regions around the world, including Europe (Bell et al. 2015; Rees and Kupiszewski 1999; Sánchez and Andrews 2011). Existing studies are, however, exclusively based on cross-sectional data and period measures, such as crude migration intensities, age-specific migration intensities and migration expectancy[1]. Like period estimates of fertility, these measures have the advantage of measuring contemporary migration trends and are relatively easy to interpret. Period measures represent, however, the compound experience of different cohorts and can potentially be distorted by tempo effects, which artificially inflate or deflate the period measure of a demographic event due to a rise or fall in the mean age at which the event occurs (Bongaarts and Feeney 2008). In addition, period measures tend to highlight yearly variations in migration due to transient influences. This is particularly problematic when comparing countries because economic cycles, housing market conditions, and government policy regimes are unlikely to be in phase in different national contexts (Bell et al. 2002). In contrast, a cohort approach reflects the lifetime behaviour of real individuals and has the advantage of smoothing out short-term temporal variations in migration since individuals may live through periods of high and low mobility.

A cohort perspective based on completed residential histories is by no mean a new idea. Bogue (1950) was a vigorous advocate of a cohort approach to migration analysis, and Shyrock and Larmon (1965) were the first to use retrospective migration histories to estimate average number of moves in a lifetime. Recent studies in England (Falkingham et al. 2016) and Sweden (Kolk 2016; Kulu et al. 2014) have revealed important inter-cohort variation in migration behavior. These studies are based, however, on particular aspects of migration such as age patterns, move order or the total number of lifetime moves and have not advanced our understanding of the mechanisms underlying variations in migration levels. What is missing is a series of robust measures that allow the comprehensive comparison of migration behavior

[1] Migration expectancy corresponds to the average number of moves a person could expect to make in a lifetime subject to the age-specific migration rates and mortality conditions of a given year.

across cohorts and countries to systematically quantify variations in migration levels and identify the demographic mechanisms underpinning these differences.

Cohort Measures of Migration

This paper takes a first toward that end by proposing a total of ten cohort measures adopted from the fertility literature to gauge migration levels and patterns. The terminology used in fertility studies is adopted here. 'Move order' refers to the order of each move, i.e. first, second, etc., while 'parity' describes the number of moves an individual has undertaken at the time of observation. Table 1 lists each migration measure in summary form, providing a definition and an algebraic representation, where subscript *x* refers to age and *i* to parity. *M* corresponds to the number of moves, *P* to the number of individuals. Thus, P_i refers to the number of individuals at parity *i*, M_i to the number of moves of order *i* for all *i>0*.

Measure		Definition	Method
1	Completed Migration Rate	Average number of moves per individual by the end of their migratory life	$CMR = M/P$
2	Parity Progression Ratios	Proportion of a cohort who moved at least *i* times and who went on to move at least once more	$PPR_{(i,i+1)} = \frac{M_{i+1}}{M_i}$
3	Order-Specific Migration Rates (or Parity Distribution)	Proportion of a cohort at parity *i*	$OSMR_{(0,i)} = \frac{P_i}{P}$
4	Age-Specific Migration Rates	Proportion of a cohort who moved at age *x*	$ASMR_x = \frac{M_x}{P_x}$
5	Normalized Age-Specific Migration Rates	Proportion of a cohort who moved at age *x* normalized to unity	$NASMR_x = (\frac{M_x}{P_x}) \Big/ (\sum_{x=1}^{X} M_x/P_x)$
6	Migration Mean Age*	Mean age at which individuals of cohort moved	$MMA = \sum_{i=1}^{I} X_i * M_i \Big/ \sum_{i=1}^{I} M_i$
7	Mean Migration Spacing	Average lengths of all intervals between moves for individuals who moved at least twice	$MMS = \sum_{i=1}^{I} (MMA_{i+1} - MMA_i) * M_i \Big/ \sum_{i=2}^{I} M_i$
8	Age-Order-Specific Migration Rates	Proportion of a cohort who moved at least *i* times at age *x*	$AOSMR_{x,i} = \frac{M_{x,i}}{P}$
9	Migration Mean Age by Parity	Mean age at which individuals of cohort moved at least *i* times	$MMA_i = \sum_{x=1}^{X} (x + 0.5) * M_{i,x} \Big/ \sum_{x=1}^{X} M_{i,x} X_i$
10	Mean Migration Spacing by Parity*	Average time between two consecutive moves	$MMS_{(i,i+1)} = MMA_{i+1} - MMA_i$
INTER-RELATIONS			$CMR = M/P = \sum_{x=1}^{X} M_x/Px = \sum_{x=1}^{X} ASMR_x$ $CMR = M/P = \sum_{i=1}^{I} M_i/P = \sum_{i=1}^{I} PPR_{(O,i)}$

***** *Formula for data by single-year age groups. For five-year age groups, 0.5 should be replaced by 2.5 in equation (6) and (9)*

Table1 Cohort measures of migration

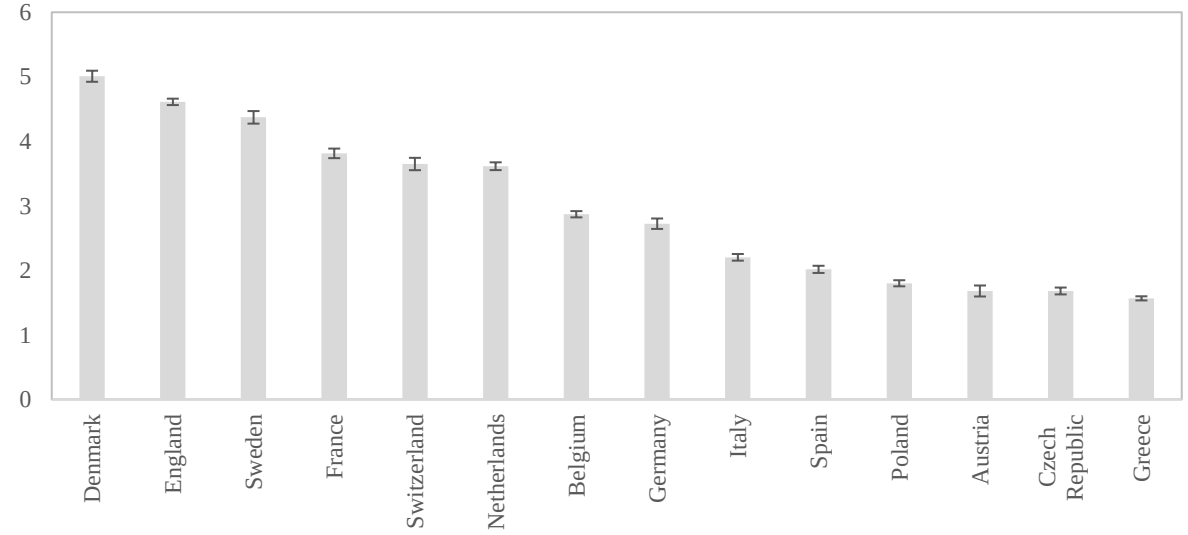
Data Sources

Cohort measures of migration can be estimated from two types of data: (1) prospective data drawn from population registers, administrative records or longitudinal household surveys and (2) retrospective data such as life histories. This paper utilizes retrospective data from the Survey of Health, Ageing and Retirement in Europe (SHARE), a longitudinal survey of the population of 13 European countries aged 50 and over and data from the English Longitudinal Study of Ageing (ELSA), a longitudinal survey of the English population aged 50 and over. Both surveys retrospectively collected between 2007 and 2008 directly comparable lifetime

residential mobility histories of individuals born between 1918 and 1957. Using life-history grids, respondents were asked to report the start and end date of up to 20 dwellings in which they lived for more than 6 months since birth. The address of each residence was collected, but to ensure confidentiality an annual indicator of change of residence was constructed instead of releasing geographic information. While this means that the distinction between short- and long-distance moves cannot be made, using all changes of addresses as a measure of migration ensures that the results are not affected by the size, shape, or changes in administrative boundaries. Respondents were between 50 and 89 years old at the time of the survey, so in order to obtain life courses of comparable length, the analysis is restricted to mobility histories from age 17 to 50. The analysis presented in this paper spans three birth cohorts: 1918-1931(n=5,723); 1932-1946 (n= 13,630), 1947-1959 (n=14,298). Preliminary results focus on the most recent cohort.

Preliminary Results

Figure 1 ranks countries from the highest to the lowest completed migration rate (CMR) for the most recent cohort and reveals pronounced variations. The average number of lifetime moves varies from highs of more than 6 in England and Denmark to lows of less than 2 in Austria and Greece. A marked North-South and East-West gradient is apparent, with the high CMRs of Nordic country countries moderating south and eastwards through to the Netherlands, Switzerland and Belgium, declining further in Italy and Spain, before reaching very low CMRs in Austria, Poland, the Czech Republic and Greece. The rank order of countries is stable across cohorts suggesting enduring cross-national variations in migration.

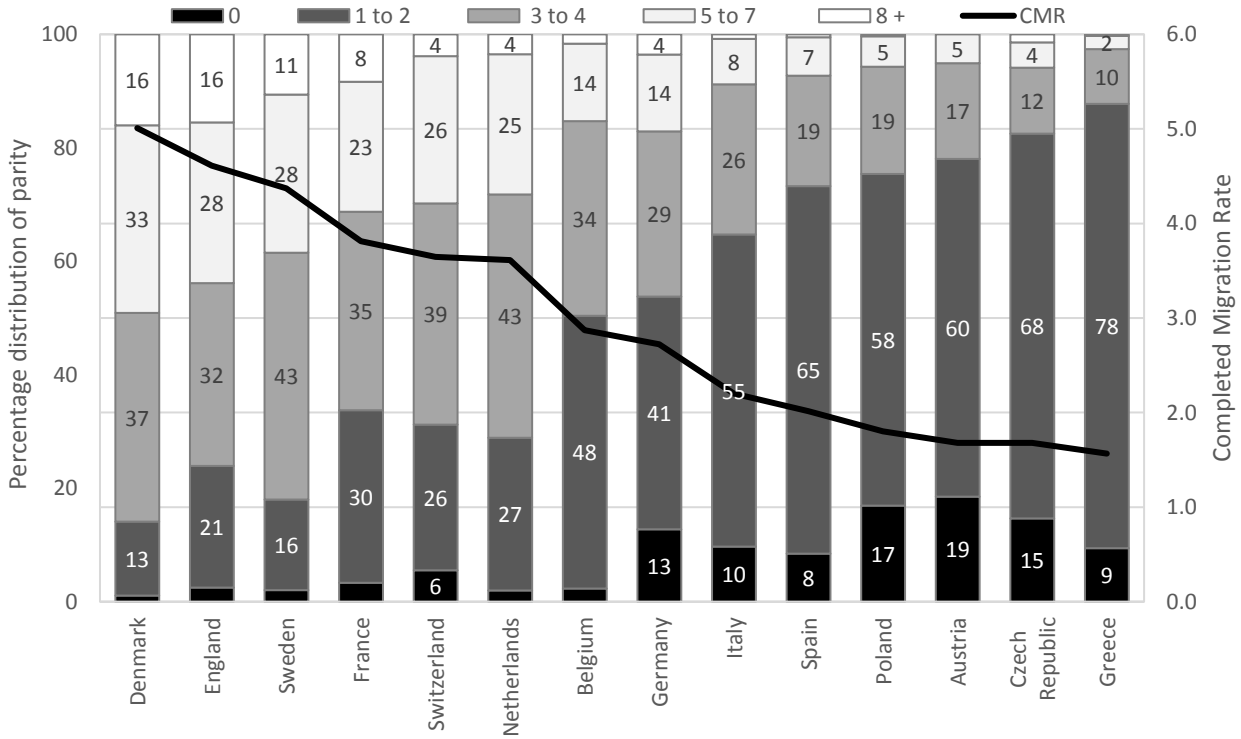


Note: error bars represent at 95 % confidence interval estimated using a t-distribution because of non-normality. For Austria, the Czech Republic, Italy, the Netherlands, Spain, Sweden and the Switzerland, the number of births was obtained from the Human Fertility Database. For years with missing data, the number to births from the closest available year was used instead. For the other countries, the number of births in 1960 was obtained from Eurostat's birth and fertility database and was assumed to be the same of each year from 1947 to 1959.

Figure 1 Completed Migration Rate, Cohort 3 (1947-1959)

While the CMR is a summary measure that is helpful to identify high and low migration countries, the actual migration behaviour of individuals is more heterogeneous that summary statistics suggest. Because average measures are at risk of concealing the variety of migration behaviour, parity distribution, which corresponds to the proportion of individuals who moved

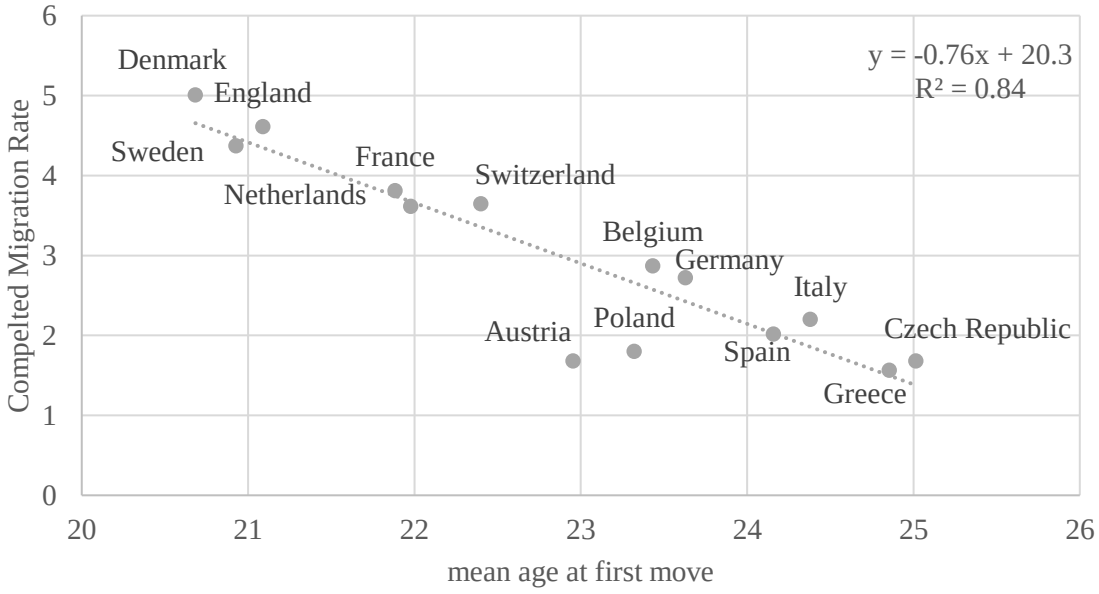
n times in their life, is useful to describe the actual range of migration experiences. Figure 2 reports parity distribution by countries ranked in order of decreasing completed migration rates. It shows that the high CMRs of Nordic and Western countries are attributable to the combination of very low percentages of non-movers and large proportions of frequent movers (5 moves or more). In contrast, the low mobility countries of Southern and Eastern Europe display opposite patterns of high proportions of non-movers and very low proportions of frequent movers. In England, Denmark and Sweden, 40 to 50 per cent of individuals moved 5 times or more compared to less than five percent in Poland, Austria, Czech Republic and Greece.



Note: cohort 3 (1947-1959)

Figure 2 Parity distribution and completed migration rate

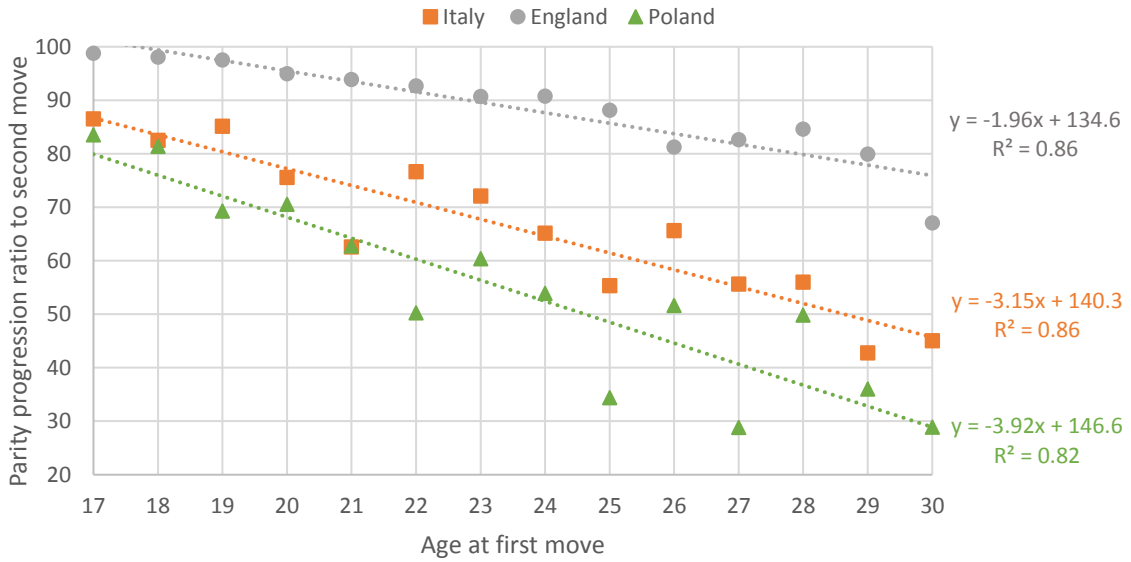
Are cross-national differences in the number of lifetime moves associated with particular migration patterns? To address this question, Figure 3 plots mean age at first move in adulthood against the Completed Migration Rate and shows a clear negative relationship, indicating that later ages at first move in adulthood are associated with reduced lifetime migration. North and Western countries combine an early occurrence of first move and high lifetime migration, while countries to the South and East exhibit the opposite pattern of delayed first moves and low lifetime migration.



Note: cohort 3 (1947-1959)

Figure 3 Mean age at first move against completed migration rate

To further elucidate the association between the timing of the first move in adulthood and the number of lifetime move, the paper next explores parity progression ratios by age. Parity progression correspond to the proportion of individuals with *n* moves who went on to move at least *n+1* times, so that a progression ratio of 90 indicates that 90 percent of individuals who moved *n* times on to move at least *n+1* times. Considering that the probability of migrating falls with age (Rogers and Castro 1981), one can expect that the likelihood of progressing to the next move to decrease with age at last move. To explore this association, Figure 4 plots parity progression ratios to the second move by age at first move for three countries with high, intermediate and low lifetime migration. For England, Italy and Poland, the data shows a clear negative association: the likelihood to move a second time decreases with the age at first at first move. For instance, the likelihood to move a second time in Italy is 86.5 per cent for individuals for first moved at age 17 and it goes down to 45.0 per cent for those who first moved at age 30. This suggests that in countries with a delayed first move the likelihood to transition to the second move will be lower than in countries with early first move. Table 2 explores this association further by reporting correction coefficients between mean age at move *i* and parity progression ratio from move *i to i +1* up to parity 6. It shows a strong negative association for all parities, with correlation coefficients ranging for -0.75 to -0.84. Thus, for all parities, older ages at last move are associated with lower parity progression ratios to subsequent move.



Note: results are for all cohorts combined to maximise sample size

Figure 4 Age at first move against parity progression ratio to 2nd move

	Correlation coefficient
Parity 1 to 2	-0.84*
Parity 2 to 3	-0.87*
Parity 3 to 4	-0.83*
Parity 4 to 5	-0.84*
Parity 5 to 6	-0.75*

*Note: cohort 3 (1947-1959), * statistically significant at 0.01 level*

Table 3 Correlation coefficient between age at move *i* and parity progression ratio to move *i+1*

Conclusion

Cohort analysis of migration confirms a pronounced spatial gradient within Europe of high mobility in the North and West falling steadily to the South and East and shows that these variations are underpinned by the extent of repeat movement. High and low mobility countries are also strongly differentiated in terms of age, with the latter recording older ages at first move in adulthood. The analysis of parity progression ratios suggests that age at first move operates to affect completed migration by shaping subsequent progression to higher parities. This is because the likelihood of moving an additional time decreases with the age at last move. These preliminary results show that a cohort perspective can shed new lights into the demographic mechanisms underpinning cross-national variations in migration levels. The full paper will explore how other processes, including spacing between moves, affect lifetime migration and in turn drives differences among countries and cohorts.

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