Thomas Salzmann
Barry Edmonston
James Raymer (Eds.)

Demographic
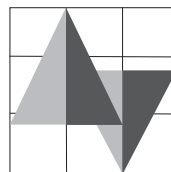# Aspects
# of Migration

VS RESEARCH

Thomas Salzmann · Barry Edmonston · James Raymer (Eds.)

Demographic Aspects of Migration

VS RESEARCH

Demografischer Wandel –
Hintergründe und Herausforderungen

Herausgegeben von

Prof. Dr. Gabriele Doblhammer,
Rostocker Zentrum zur Erforschung des Demografischen Wandels, Rostock

Prof. Dr. James W. Vaupel,
Max-Planck-Institut für demografische Forschung, Rostock

Unsere Gesellschaft verändert sich tiefgreifend: Immer mehr Menschen erreichen in Gesundheit ein hohes Lebensalter, immer weniger Kinder kommen zur Welt, neue Partnerschafts- und Familienstrukturen entstehen, Menschen wandern über regionale und nationale Grenzen hinweg. In Zeiten einer alternden und schrumpfenden Bevölkerung sind neue Entwürfe für Biografien, für das Zusammenleben, für den Arbeitsmarkt, für den Wohlfahrtsstaat aber auch für die Regional- und Stadtplanung gefragt. Mit dieser Schriftenreihe wollen die Herausgeber zur verantwortungsvollen Diskussion um die Hintergründe und Herausforderungen des Demografischen Wandels beitragen und aktuelle Forschungsergebnisse in kompakter, allgemein verständlicher Form darstellen.

Thomas Salzmann
Barry Edmonston
James Raymer (Eds.)

Demographic Aspects of Migration

Foreword

Dr. Albert Schmid
President of the Federal Office for Migration and Refugees

According to the United Nations, about 200 million people of the estimated world population of 6.8 billion are international migrants – that corresponds to about three per cent of the total world population. The proportion of international migrants in the global population has increased only marginally in the last 40 years. But, as a result of global population growth, the absolute number of migrants has increased, and their structure and spatial distribution has changed considerably. A structural shift has taken place primarily in the industrialised countries, where less than 20 per cent of the global workers are now living, but where more than 60 per cent of all migrants worldwide reside. Since 1990, more than 16 million people have moved to Germany, while about 11 million have left the country in the same period. Altogether, 15 million people of international migration origin are living in Germany, comprising almost 19 per cent of Germany's current population of 82 million. At the end of 2006, about 64 million people out of Europe's population of 732 million, or nine per cent, lived in a European country they were not born in.

But why does anybody migrate at all? People decide to leave because, in general, they expect to find better conditions and opportunities in other countries or regions.

The most important impetus for migration processes are economic factors. In a microeconomic view, migration flows are influenced by – at least in the context of the Western European receiving societies – short-term cyclical economic conditions, middle-term changes of the production organisation and basic structural settings of the national economies. Political and social factors determine migration flows, as well. These factors can take several forms: from local conflicts between power holders and the opposition or between majorities and minorities, to the general oppression of the population and nationwide human rights abuses. Environmental and climatic conditions can also be initiating factors for international migration processes. However, there are a wide range of environmental conditions that might influence migration, and it is difficult to predict how the future volume of migration may be affected by continuing environmental changes.

Demographic trends influence internal and international migration processes over the long term. In this context, the tempo and the regional spatial distribution

of the population growth are essential parameters. According to the United Nations Population Division, the estimated increase in the world population to more than 8.0 billion people in 2025, and to 9.1 billion in 2050 (under medium variant assumptions), will take place almost entirely in the developing countries, mainly in Africa and Asia. This vast population growth will intensify internal migration in the poorer countries (mainly rural-urban migration), and, as a possible result, will raise the potential for migration to Europe. In addition, this predicted population trend may act as a pull factor in Western European receiving countries, if a long-term population decline results in the lack of an adequate future workforce. These European countries face the question of whether these trends can be addressed by new, rational measures, or if, indeed, higher levels of migration are required.

To answer the question, studying the causes of migration, including the extent to which demographic trends in general, and migration in particular, influence population change, is of the greatest importance. The research group of the Federal Office, in co-operation with the research group "Young Demography" of the German Association for Demography (DGD), hosted a conference with the title "Demographic Aspects of Migration" in Nuremberg, Germany, on 9 and 10 October 2008. Researchers from several countries, as well as representatives from different Federal and State Offices, presented and discussed their research findings. Four topics were the focus of attention: population dynamic aspects of migration, demographic processes of migrants, socioeconomic aspects of migration and processes of internal migration.

Acknowledgements

Contents

Introduction

Barry Edmonston, James Raymer, Thomas Salzmann

International migration between countries and internal migration within countries have become the main source of population change within recent decades. Prior to about 1750, mortality fluctuations were the major determinant of population dynamics. In the pre-industrial period in currently developed countries, fertility was relatively high and population movements were either relatively local – between nearby villages or within primarily rural agricultural areas – and limited to small groups of merchants or infrequent actions of military forces. Under these demographic conditions, the regular and often large fluctuations of mortality were the principal factor affecting population change. In the worst years – such as during the mid-1300s when the bubonic plague moved out of Central Asia and swept through Europe – mortality losses claimed more than one-fourth of the existing population. During times of heavy mortality, the number of deaths greatly exceeded the contributions of births and substantial population losses occurred. In other years, mortality was more modest and population would slowly increase. These periods of modest mortality should not be thought of as "normal", however, because the characteristic demographic situation of pre-industrial societies was fluctuating mortality, evidenced by periods of modest increase and times of heavy population losses.

Fertility declines began to occur at different times in European and North American countries around the mid and late 1700s. These fertility changes were associated with improvements in food supplies – particularly better yields in cereal grains, improved storage facilities, and better transportation for foods – and significant progress in the advancement of public health, including cleaner water supplies, workable sewage systems, and better personal hygiene. By the early 1800s, the Industrial Revolution was underway in many countries of Europe and North America, providing support for further mortality decreases. As general levels of mortality began to steadily decline, fertility emerged as the key dynamic factor affecting population change. By about 1900, life expectancy at birth has increased in countries such as Great Britain from about 25 years in the medieval period to about 40 years. With mortality decreasing and staying relatively steady, albeit influenza and other epidemics still resulting in some mortality fluctuations, fertility became the key demographic component driving population change.

Fertility did not remain constant during the later periods of mortality improvements. By the mid-1800s, insipient fertility decreases were appearing throughout Europe and North American societies. Fertility declines gathered momentum in the late 1800s and early 1900s. By the 1930s, as documented by Dudley Kirk in his classic volume entitled *Europe's Population in the Interwar Years* (League of Nations, 1946), fertility has fallen to replacement-level in many European countries. In France, for example, fertility was below replacement by 1930 and several French provinces were experiencing heavy population losses.

For the recent decades, both mortality and fertility have remained at relatively low and (generally) unchanging levels. There are important variations, however, in mortality-fertility differences in European and North American countries. In some countries – such as Italy, Spain, and Greece – fertility as remained fairly low relative to mortality and these populations will experience long-term population decreases in the absence of net immigration. Three developed countries – France, Iceland, and United States – are somewhat exceptional in having fertility levels that are close to the level required for population replacement. Other developed countries lie in between the two boundaries of very low fertility and replacement-level fertility. In this situation, international migration has become the dynamic factor affecting population growth.

Background

This collection of research papers explores demographic issues related to migration from an interdisciplinary perspective. The issues relate to the population dynamic processes caused by migration, as well as the relationship between migration and fertility, migration and mortality and morbidity, and the socio-demographic and economic aspects of migration. Special thanks go to the Federal Office for Migration and Refugees, for their financial and organizational support.

We have grouped the 12 chapters in this volume in four sections below for purposes of discussion: measuring immigration and its effects, immigration and natural increase, labour force and employment, and internal migration and migration to Japan.

Measuring Immigration and Its Effects

The first three chapters deal with questions of migration data and measuring the effect of migration on population change. Barry Edmonston describes various methods for measuring the contribution of immigration to population, including a detailed illustration of one method useful for a historical reconstruction of Canada's

population. Before beginning the study of migration and population dynamics, we need to have accurate data. If no reliable data are available, there are other methods for estimating both internal and international migration flows, as described in a chapter by James Raymer. In a third chapter, Alberto del Rey and José Antonio Ortega demonstrate the usefulness of the birth replacement ratio for interpreting the role of migration in population dynamics for Spain, including analysis of international migration and migration changes for regions and provinces.

The question of the contribution of international migration to population growth has interested demographers for some time. At first glance, it may appear that it would be relatively simple to calculate and interpret the contribution of immigration. If one knew that a population received 100,000 immigrants last year, is not that a simple and easy to explain the number "100,000" as the contribution of immigration to population growth? The contribution of immigration, however, has a more complex set of effects. First, not all immigrants remain in their new destination and, for most immigrant-receiving countries, a significant proportion of immigrants later emigrate. So, emigration is a critical factor to take into account when studying the contribution of immigration. Second, immigrants make an important indirect contribution to population growth through their childbearing. In some countries, such as the United States, the fertility levels of immigrants are considerably higher than other residents, which magnifies the long-term contribution of immigrants to population change. In other countries, such as Canada, the fertility levels of immigrants are not greatly different than other residents, but the indirect effects of childbearing will still have important demographic consequences.

In the chapter by Barry Edmonston, he reviews three broad approaches that demographers have developed for measuring the contribution of immigration to population growth. The first approach deals with the study of period changes, focussing on population change during a specific period of time. It is quite common for demographers to use census and administrative records on international migration to report the amount of immigration – or immigration, emigration, and net immigration – for five or ten-year periods. Edmonston notes that there are two useful variants for this type of study. One variation is to estimate the indirect contribution of births to immigrants in order to assess the overall contribution of immigration during a period of time. A second variation is useful when studying populations with limited or inadequate data: it is a technique that estimates "corrected" international migration, birth, and death figures so that they are consistent with census data for the initial and ending period of study.

The second approach involves the use of cohort-component population projection models. These models share a common framework, starting with birth cohorts, and moving them through time while making assumptions about changes due to the components of birth, death, and migration. Cohort-component population projections models have been commonly used by researchers and government statistical

agencies to provide alternative forecasts for national populations, often illustrating the effects of zero and different levels of net immigration on future population growth. A novel adaptation of the basic model has been to incorporate immigrant generations that usually distinguish immigrants (the first generation), sons and daughters of immigrants (the second generation), and all subsequent generations. Such models have proved to be useful for the study of the effect of immigration on the labour force, ethnic intermarriage, and citizenship and nationality.

Cohort-component projection models are informative for studying the contribution of immigration to past population growth. Edmonston's chapter presents a detailed description of data sources, methods, and results for a historical reconstruction of Canada's population growth from 1851 to 2006. His work reveals that more than three-fourths of Canada's population growth during 1851 to 2006 was due to immigration, including childbearing of immigrants and their descendants. This type of approach is particularly helpful for understanding the long-term consequences for immigration during historical periods of time for population growth.

The third approach involves the use of stable population models to analyze migration's effect on population change. Some of the most useful demographic work has involved stationary population models that examine the role of immigration in the context of a hypothetical population with replacement-level fertility – that is, an assumption that the population has a net reproduction rate of 1, which implies long-term zero growth and an unchanging stationary population. These models have been useful for explicating and interpreting national and sub-national population dynamics influenced by international and internal migration.

The chapter by James Raymer notes that data on both international and internal migration are often inadequate. His chapter proposes a general methodological framework for estimating and improving migration data by using information from multiple sources. This general framework is applied to estimate a time series of detailed flows of internal migration in England and international migration between countries in Europe.

Current data on international and internal migration are often deficient in several ways. Regarding international data, origin-destination information may be derived from both sending and receiving countries, sometimes by sex and age. However, many countries do not provide data, for example Belgium, Estonia, Greece, France, and Ireland, among others. For those countries providing data, there are differences in migrant definitions and collection methods. For example, Norway applies a six month criterion to define an international migrant, whereas Sweden uses twelve months, Germany uses no particular definition and Poland uses 'permanent'. These differences in definition have important consequences for the number of report migrants. Second, there are differences in the reliability of data collection itself, with some countries underreporting the number of immigrants, either because the registration system does not canvas everyone or because some

migrants avoid registration deliberately. Similar problems exist for internal migration data, which are collected from periodic censuses, surveys or population registers.

The approach proposed by Raymer involves the estimation of origin-destination flow matrices – including selected characteristics of migrants, such as age, sex, ethnicity, and other variables of interest – using a log-linear statistical model. The approach consists of three key steps. In the first stage, data sets of interest are located and a model that incorporates these available data is developed. Next, if required, the basic data sets are harmonized, attempting to reconcile different variable definitions and achieving consistency among different estimates. Finally, a log-linear statistical model is used to estimate the migration flows.

Raymer's chapter provides two useful illustrations of the valuable new work on providing improved migration estimates. His first example shows how annual ethnic migration flows can be estimated for nine regions of England, and how annual economic activity flows can be estimated for 47 counties of England. His second example provides annual international migration estimates for 31 European countries. Raymer's work provides a helpful, new flexible framework for migration data, and is especially useful in the situation in which there are missing data. Moreover, the framework can be adapted for different levels of geography and for different policy needs.

As noted above, a particular challenge for today's demographers is to develop methods for understanding population dynamics in the context of migration. As argued by Alberto del Rey and José Antonio Ortega in their chapter, earlier work on population dynamics was dominated with the effects of fertility and mortality because migration often had a negligible role. Now, fertility and mortality are usually low and steady in modern societies and migration is the main determinant in population change. del Rey and Ortega have recently proposed some innovative methods for taking account of migration, fertility, and mortality, for both national and subnational populations. They illustrate their methods with analysis of population change in Spain and its regions and provinces.

del Rey and Ortega argue that there are limitations in demography's traditional measures of population change and fertility levels because they do not incorporate the effects of migration and assume a constant rate of fertility. They suggest that the use of birth replacement ratios (BRRs) and its components provides information and insights on the reproductive situation of a national or regional population. Their chapter describes the birth replacement ratio and the decomposition of BRR into components that measure the effect of migration.

During the twentieth century, the population of Spain was greatly affected by the emigration of Spaniards, with almost a 20 per cent loss of women in the childbearing years in the period from about 1900 to 1940. Because of heavy emigration, the observed ratio of the number of births to the number of mothers was considerably less than the traditional net reproduction rates (the calculated net reproduc-

tion rate for this period suggests that the ratio of daughters to mothers would be about 1.3; in fact, the ratio was about 1.0 because of emigration). Since 2000, migration has had an opposite effect. Although current fertility is comparatively low in Spain, there is positive net immigration and the observed ratio of daughters to mother is slightly higher than calculated by implied by the conventional net reproduction rate.

Birth replacement ratios are useful for studying regional population dynamics, as shown by del Rey and Ortega's analysis of regional and provincial populations in Spain. Internal migration has lead to population losses in some areas and caused strong population growth in others. International migration, however, has not followed exactly the same pattern as internal migration, which complicates the description of the role of migration for sub-national populations in Spain. Nevertheless, the use of birth replacement ratios provides a needed technique for interpreting the role of migration in population change.

Immigration and Natural Increase

As noted above, migrants do not only add (or subtract) a resident from the study population. Every migrant also has an effect on population dynamics because of birth or death. The arrival of a relatively old immigrant may affect deaths in the population in the near future. On the other hand, the arrival of a young woman may affect births in the population over the next few decades, and her possible children will subsequently affect fertility and mortality in later years. This volume includes three chapters that examine the fertility and mortality aspects of immigrants. Kirk Scott and Maria Stanfors examine fertility changes for immigrants and the immigrant second-generation in Sweden. Martin Kohls presents a study of German migrant mortality using administrative data bases. Susanne Schmid and Martin Kohls provide an overview of the reproductive behaviour of female migrants in Germany, with special focus on a comparison of immigrant and non-immigrant fertility from 1970 to 2005; they also rely on additional administrative data bases for further information about immigrant fertility.

Immigration has played an important role in Sweden during the past five decades. The foreign-born population of Sweden numbered fewer than 100,000 in 1945, but has increased to 1.2 million in 2008. In 2007, more than 13 per cent of the Swedish population was foreign-born; in addition, about 11 per cent of the Swedish population was born in Sweden but with one or more foreign-born parents. Statistics Sweden expects the foreign-born population to increase by another one-half million by 2050. The study of social integration of immigrants in Sweden raises questions about education, social mobility, labour force status, intermarriage, and other issues. One important topic for study is understanding immigrant fertility and

assimilation. Kirk Scott and Maria Stanfors take an intergenerational approach in their chapter by investigating the childbearing behaviour of immigrant women and second-generation women.

The fertility of immigrants in Sweden varies for different countries of origin. The childbearing patterns of women born in Nordic and European Union countries is similar to that of Swedish women, who currently have about 1.9 children over their lifetime. Women who were born outside of Europe have higher fertility than Swedish women, although available research suggests that immigrant women adjust to the fertility pattern of Swedish women with longer duration of residence in Sweden.

Empirical research on the fertility of the immigrant second-generation has received less attention, and the Scott and Stanfors' chapter provides a useful addition to available studies. They analyze data from the Swedish Longitudinal Immigrant database to construct a multi-generational data set along with information about births. Their analysis reveals that, for second-generation immigrant women, integration has largely occurred, and national background does not provide much additional information about the childbearing behaviour of women. Rather, other factors such as employment and education offer more important information about first-time childbearing and overall childbearing levels.

Overall, the Scott and Stanfors chapter will interest readers involved in the study of the relationship of employment and childbearing. The results of their study suggests that the effects of the Nordic model of combining employment and childbearing has similar effects for immigrant and non-immigrant women, that all women seem to respond to the same incentives in similar ways. Differences that exist in childbearing appear to be primarily affected by education, especially the timing and attainment levels.

A number of studies have reported that the mortality patterns of migrants differ from those of non-migrants. These studies generally report that migrants have lower mortality than the other resident population. Because, in some studies, migrants have lower education and income than others, this has been pointed out as a paradox because there is usually a positive relationship between socioeconomic status and lower mortality. The usual explanation for this paradox is that migrants display a "healthy migrant" selection. This is based on the notion that people who migrate are both self-selected to be healthy (chronically ill or disabled are less likely to move) and selected deliberately by the receiving country (many immigrant-receiving countries require a medical examination prior to issuing a visa for migration). In the chapter by Martin Kohls, he discusses a theoretical framework for understanding the selection process and raises the question about whether adequate data have been used for studying the selection process in previous studies. He uses two administrative data sets to analyze the selection process and the mortality for migrants in Germany.

Kohls begins his analysis by demonstrating the inadequacies of official German death statistics for the mortality study of migrants. The key limitation for official death statistics is that the foreign-born population was last enumerated in the census of 1987. But, because the foreign-born population has been leaving Germany at higher than assumed levels, the actual number of immigrants in the Germany is probably less than estimated. As a result, the number of deaths relative to the estimated foreign-born population displays a declining overall death rate compared to the total population. At present, the official death rates for the foreign-born look implausibly low.

Kohls recommends that mortality statistics on migrants in Germany make use of two alternative administrative data sets, the Central Register of Foreigners (AZR) and the Statutory Pension Insurance (GRV). His analysis reveals that the mortality levels for migrants in these two data bases are higher than in official death statistics. The AZR data shows lower mortality for Asian and African migrants than other residents, supporting the healthy migrant effect. On the other hand, these migrants move to higher mortality – similar to other residents – with longer duration of residence in Germany. The GRV data do not show a mortality advantage for migrants and, in fact, provide evidence of higher mortality for migrants from the former Yugoslavia. Overall, Kohls' analysis of two administrative data sets finds mortality differences between migrants and Germans that are considerably less than reported in official statistics. And, if a mortality advantage exists for migrants, it appears to be a difference that characterizes the initial years after arrival and is not an advantage that persists for long periods after arrival.

A chapter written by Susanne Schmid and Martin Kohls examines the fertility of immigrants in Germany. The number of persons of immigrant background in Germany has increased steadily in recent years, and now number almost 7 million, or 8 per cent of Germany's total population. Given Germany's relatively low fertility (a total fertility rate of 1.38 children, which is significantly below the 2.1 level required to replace the population) and increasing proportion of immigrants, it is useful to study possible fertility differences for immigrants, and factors related to these possible differences.

Current research on fertility in Germany is hampered by the lack of adequate data. Previous fertility studies on immigrant fertility have relied on official statistics, which are found to be deficient, in part because only births registered in Germany are linked to resident women and many immigrant women have had children born outside Germany. Schmid and Kohls provide a comprehensive review of current German databases that are potentially useful for fertility research. Using official statistics and administrative data from the Central Register of Foreigners (AZR) and the Statutory Pension Insurance (GRV), they find that the total fertility rate of foreign women is between 1.62 and 1.83 and the similar rate for non-immigrant German women is 1.30 – the total fertility rate for foreign women is about 25 to 40

per cent higher than that for other women in Germany. Nevertheless, it should be observed that the total fertility rate for immigrant women is also significantly below replacement. While the fertility rate for immigrant women partially counterbalances the very low fertility rate for other women, it does not dramatically increase the overall total fertility rate for Germany.

The GRV data distinguish immigrant women by nationality, which permits separate estimates of fertility to be made for different groups. The highest total fertility rates are for African women (2.2, which are the only national group with above replacement fertility), Asian women (1.9), and Turkish women (1.8). Other nationality groups have fertility similar to that of German women. Women from neighbouring countries, such as France or the Netherlands, report extremely low fertility (total fertility rate of 1.1).

Available data sets on fertility permit only limited analysis of the factors related to current childbearing. There is room for further theoretical and empirical research on Germany fertility in order to improve understanding of the processes accounting for immigrant and non-immigrant fertility differences.

Labour Force and Employment

One of the most important aspects of immigration deals with the labour force and employment. This is a critical issue primarily because a key motivation of most immigrants is to improve their economic situation, which involves finding employment in their new destination country. In seeking employment, immigrants also affect the host country's labour market. Such effects have become one of the most prominent and controversial issues in current debates about immigration. In a 2008 report entitled *Transatlantic Trends: Immigration*, the German Marshall Fund reported that one-third of European respondents were worried about negative effects of immigrants on domestic employment. The greatest concern about deleterious employment effects of immigrants was in the United Kingdom and the United States, where more than one-half of respondents thought that immigrants would take jobs away from domestic workers.

Before discussing the two papers dealing with labour force and employment, it is helpful to summarize a leading review of what is known about the effects of immigration on the labour force. In the mid-1990s, the U.S. National Academy of Sciences in Washington, D.C. convened a panel of 10 economists and demographers with expertise in immigration. Their report, entitled *The New Americans: Economic, Demographic, and Fiscal Effects of Immigration*, was published by the National Academy Press in 1997 and offers a non-partisan, balanced assessment of the economic effects of immigration. This panel found that, although immigration makes national output go up, some domestic workers suffer and other workers benefit.

Immigration yields a positive net gain to domestic workers, but the gain is not spread equally: it harms workers who are substitutes for immigrants while benefiting workers who are complements to immigrants. Most economists believe that un-skilled domestic workers are the substitutes, so their wages will fall, and skilled domestic workers are complements, so their wages will rise. These are important conclusions to keep in mind, because public perceptions and statements from political leaders often misperceive the labour market effects of immigration and some argue incorrectly that *all* workers are harmed by immigration.

This volume includes two chapters that investigate labour market issues and immigration. These two chapters give some descriptive information about the migrants: are there specific migrant groups, where do they come from, what is their demographic and socioeconomic background, how is their spatial distribution, is there a correlation to specific variables? The first chapter, co-authored by Federico Benassi and Linda Porciani, examines the destination choices made by immigrants in Tuscany, a region in central Italy that includes Florence, Pisa, and the rural area of Chianti. The second chapter, authored by Marina Shapira, looks at the effect of immigration on domestic employment and opportunities in Great Britain.

The chapter by Federico Benassi and Linda Porciani provides information on the dual demography of immigrants settling in Tuscany, Italy. They rely on 2001 Italian census data to show the settlement patterns of immigrants in Tuscany. As they note, however, the immigration situation has changed in two important ways since data collection for the 2001 census. First, the Italian government enacted legislation in 2002 that resulted in large scale legalization of previously undocu-mented immigrants. And second, twelve new, poorer countries became members of the European Union (EU) between 2004 and 2007, which has lead to larger flow of immigrant arrivals in Italy from these new EU members.

Tuscany has emerged as the fastest growing area of settlement for immigrants in Italy. The foreign-born population has increased five-fold from 18,000 in 1981 to 109,000 in 2001, increasing from 0.5 per cent to 3.1 per cent of the total Tuscany population – compared to increases from 0.4 per cent to 2.3 per cent for the overall Italian population during the same period. By 2007, based on recent Italian government statistics, the foreign-born population in Tuscany has increased to 234,000, or 6.4 per cent of the total population. The countries of origin have special interest, because more than one-half (54 per cent) of immigrants in Tuscany come from Central and Eastern European countries, with Albanians being the most numerous, followed by immigrants from Romania and Poland. Not all large groups of immigrants arrive from Europe however. Chinese immigrants, numbering 25,000, or ten per cent of the foreign-born population, comprise a large recent immigrant group.

Benassi and Porciani argue that there is a dual profile to immigration in Tuscany because there are also a large number of foreign-born residents who come from

more-developed countries, including Germany, which has provided nearly 5,000 immigrants. The dual profile of immigrants in Tuscany is documented in other ways. Many immigrants from poorer countries settle throughout Tuscany (except for Chinese immigrants, who live in Florence and Prato near fashion and manufacturing centres), while immigrants from richer countries live in Florence or the attractive rural areas of Grosseto and Livorno. There are age and sex differences involved in the dual profile. Immigrants from poorer countries are younger and include slightly more men than women. Among immigrants from richer countries, however, they are older and include considerably more women than men.

What accounts for this dual profile of immigrants in Tuscany? Although Benassi and Porciani argue that it is hard to present definitive statements, the immigrants from poorer countries seem to be consistent with explanations of economically-driven migration, including younger immigrants (especially men) who arrive in Tuscany because of job opportunities. The motivation for immigrants from richer countries is less clear: their age-sex characteristics are not consistent with the notion that they are retirees, but their settlement pattern also suggests that they are not solely motivated by employment. Some may be early retirees and others may have adequate income for starting a new life in Tuscany where housing is less expensive and there are improved amenities.

The chapter by Marina Shapira examines the effect of immigration on employment and occupational opportunities in Great Britain. Although her paper focuses on Great Britain, it has wider appeal because it presents a useful conceptual framework for studying immigrant's effect on the labour market and utilizes a particularly innovative data set. Great Britain began to experience a dramatic increase in the number of immigrants in the late 1990s. This increase resulted from two factors: relatively attractive employment opportunities in Great Britain and changes in British immigration policy. The most important policy change was the accession of new European Union members with the right to free movement and work in the United Kingdom in 2004. Like other countries, there were fears in Great Britain that "cheap workers" from Eastern and Central Europe would reduce wages and take jobs away from domestic workers.

Shapira's study documents that immigrants have a profound effect on the host country's labour market because immigrants tend to concentrate in particular areas and to specialize in selected industries and occupations. This concentration and specialization usually makes their effects more noticeable. Her study is based on the United Kingdom's Annual Population Survey, a large annual household survey of about 375,000 individuals that provides sample data and estimates for about 200 local labour markets. Her analysis provides descriptive and multivariate analysis. Three outcome variables are examined: (i) being out of the labour force or being long-term unemployed, (ii) being in a skilled manual or supervisory occupation

versus being unskilled or unemployed, and (iii) being in white collar or professional occupation versus being unskilled or unemployed.

Shapira's paper presents a nuanced discussion of the empirical findings, which is beneficial because many commentators could easily use the results from this type of study to increase public concerns about immigrants. Overall, her findings suggest that immigrants do not have a negative effect on occupational opportunities of non-migrant British workers who have average levels of educational attainment. Many recent immigrants have sought employment in unskilled occupations; however, it is unclear whether this has had negative effects on domestic workers or whether native workers have had alternatives to low-paid employment. Furthermore, in *some* localities of Great Britain, better educated recent immigrants appear to have had a negative effect on the likelihood of British-born workers finding white collar employment; but, this effect is found only in selected localities where there were relatively few immigrants prior to 2004 and where recent immigrants now comprise a significant proportion of the local population. Finally, Shapira's study concludes that there is no evidence that British-born ethnic minorities or residents with lower levels of education have been more adversely affected by immigration than white British-born residents with average educational levels.

Internal Migration and Migration to Japan

The fourth part of this volume includes three chapters dealing with internal migration and a chapter on migration of caregivers to Japan. One chapter notes that there has been a decline in neighbourhood quality for immigrants in Canada, and asks whether this decline could be eased by shifting flows away from Canada's three major metropolitan areas (Montréal, Toronto, and Vancouver) to other parts of the country. The volume includes two chapters that focus on the interesting topic of migration between East and West Germany's regions, a topic that has received considerable attention in politics and the press. Jenny Schmithals' chapter examines the reasons for migrants moving to Magdeburg, an industrial city in East Germany. In a second chapter, Silvia Maja Melzer looks at the effect of regional characteristics on the migration of people from East to West Germany. A fourth chapter deals with how migration policy in Japan is changing because of the accelerating increase in population aging, and how a greater number of elderly is creating the need for more health-care workers.

A chapter by Michael Haan studies the neighbourhood quality for immigrants in Canada. He notes that about three-fourths of all arriving immigrants in Canada settle in the three largest metropolitan areas of Montréal, Toronto, and Vancouver – called Canada's immigration gateway centres. During 1996 to 2001, Toronto alone received about one-half of all new immigrants. As the number of immigrants in

these three metropolitan areas increased, however, immigrants' overall levels of well-being declined. In recent years, Canada's immigrants have fared worse in terms of earnings, employment mismatch, neighbourhood quality, and homeownership. Haan raises the question of whether immigrants would gain access to a better life in Canada if they settled outside the three main immigrant-receiving metropolises. This is not an idle academic question because Canadian government policymakers have expressed concerns about the "unbalanced geographic settlement" of immigrants while, at the same time, some local policymakers have suggested that it would be helpful to encourage immigrant settlement in other provinces, cities, and rural areas.

Haan notes that there are two key reasons why neighbourhood quality would improve for immigrants who settle outside the three gateway centres. First, there would be better employment options, which would provide families with improved economic resources. Second, the price of housing is considerably lower outside the gateway centres and a similar amount of financial resources would provide better housing in non-gateway areas. Although every city has undesirable areas, Haan argues that immigrants might benefit from improved neighbourhood quality if they were to settle in non-gateway cities, and this is the proposition that he examines empirically in his chapter.

Neighbourhood quality is measured in three ways in Haan's empirical analysis: median income, per cent with low family income, and per cent of dwellings in need of repair. His analysis shows, for all three outcome measures, that immigrants who live in non-gateway areas have improved neighbourhood quality compared to similar immigrants in the gateway metropolitan areas. Some caution is needed before jumping to the easy conclusion that *all immigrants* settling in gateway centres would have improved neighbourhood quality if they settled instead in non-gateway areas. If all immigrants were to settle elsewhere upon arrival in Canada, this would affect the quality of neighbourhoods in both the areas that they avoid as well as the new destination areas, which would alter the neighbourhood quality in both "old" and "new" areas. With this caution in mind, however, Haan's research suggests that there would be possible improvements in neighbourhood quality if immigrants moved away from gateway centres to other areas.

The chapter by Jenny Schmithals is based on a research project that has interviewed recent migrants to Magdeburg, Germany, including people who were returning to Magdeburg after living elsewhere. She notes that earlier studies have revealed that more than 50 per cent of East German migrants to West Germany wish to return and that return migration now accounts for a large share of current migration to East Germany. There have been few empirical studies, however, that try to understand the motivation and reasons for return migration to East Germany. Without adequate studies, it is difficult to evaluate possible policies and program that might encourage or support return migration.

Magdeburg provides an interesting research site for Schmithals' research because it has suffered considerable deindustrialization and out-migration since the reunification of Germany. Magdeburg had about 280,000 residents in 1990 but decreased to about 230,000 by 2007. Out-migration following reunification has been highly selective, with a loss of younger adults and those who have employment skills that are sought elsewhere. Most migrants to Magdeburg previously lived in West Germany, including 70 per cent of residents who were returning to Magdeburg. Many of the returning migrants are younger adults, but there are also a relatively large group of migrants who are older than 55 years.

Labour force participation rates among returning migrants are lower than other types of migrants to Magdeburg. Older returning migrants in the survey often reported that they originally left for employment reasons but has always wanted to return, and retirement offered than a chance to move back to Magdeburg. Among younger returning migrants, some had lost they jobs and decided to return because of personal reasons, including the desire to move closer to their families and friends.

This study illustrates that strong interest exists for some previous residents of East Germany to return to their home area. The study also documents that a considerable proportion of current migrants to East Germany are, in fact, returning migrants. Finally, the study points out that the reasons for return migration are varied, and are intertwined with life cycle changes such as retirement.

In a related chapter, Silvia Maja Melzer studies the relationship between regional characteristics and migration from East to West Germany. Her study focuses particularly on the effect of differences in regional income on the movement of people from East to West Germany, taking into account differences in individual characteristics. This is a useful study for German economic and population policy as well as an interesting study for migration research. Differences in the economic situation between East and West Germany were striking at the time of reunification and, indeed, persist to the current time (overall wages in East Germany compared to West Germany were 32 per cent lower for men and 19 per cent lower for women in 2006, for example).

Melzer's study relies on the 1992 to 2006 waves of the German Socio-Economic Panel, which is a representative longitudinal survey of households that was extended to the former German Democratic Republic in 1990. She identifies cases for people who were resident in East Germany at the time of original interview and examines whether the person subsequently moved to West Germany. This research design provides data on individual characteristics – such as age, education, and employment – and permits the researcher to examine regional characteristics about where people were living before and after their migration. Such data can be properly analyzed by multilevel regression models, which can disentangle the different effects of individual and regional characteristics.

The results of Melzer's statistical analysis provide evidence that individual characteristics had the strongest effect of migration from East to West Germany, but regional differences also had a potent effect. Several results are commonly seen in other empirical studies, including that migrants are usually younger and better educated. In the special case of East Germany following reunification, it is not surprising that unemployed workers and students were especially likely to move to West Germany. There are interesting differences, however, in the study of migration from East to West Germany: women are more likely to move than men and the gender-specific reasons for this difference are not apparent without further study.

Japan ranks among the countries of world with the fastest ageing population. The median age of the Japanese population is forecast to increase from 43 years in 2004 to 50 years in 2025 and an extraordinary 53 years in 2050. Gabriel Vogt's chapter describes the current situation of Japan's population – ageing and shrinking – and current Japanese migration debate. She clarifies current debate by examining the relationship between demographic change and migration policy through a case study of the international migration of Indonesian care givers to Japan.

Population ageing is primarily a result of fertility declines. With a total fertility rate of 1.29 children, Japan has one of the lowest fertility rates in the world: a total fertility rate of 1.29 implies that 100 Japanese women will complete their childbearing having only 62 daughters, meaning that the next generation will be almost 40 per cent smaller than the current generation. Such low fertility, in the absence of substantial net immigration, has two important consequences for Japan. First, the population will age fairly rapidly, with a relative and absolute decrease of children and youth, and younger adults, and a relative increase in the elderly. Vogt notes that there was an old-age dependency ratio of 29 elderly (persons aged 65 years or older) per 100 younger adults (persons aged 15 to 64 years of age) in 2004. This ratio will increase to 48 in 2025 and 67 in 2050, placing an increasingly heavy social welfare burden by the elderly on the working age population. Second, the Japanese population will experience a historically unprecedented population decline in the future. As long as fertility remains relatively low and there is little net immigration, the population will decrease an annual rate of 0.5 per cent, decreasing from 128 million in 2004 to 101 million in 2050, and a loss of 27 million residents over the next five decades.

Japan is not a major immigrant-receiving country, hosting only 2.2 million registered foreign nationals in 2007, or less than 2 per cent of the total population. Moreover, one large group of "foreign nationals" are 600,000 Koreans, a group that are descended from Korean residents of Japan who did not return to Korea after World War II. Vogt's chapter offers a useful description of Japan's current migration policy, with an interesting discussion of care-giver migration from Indonesia to Japan. The current program is relatively new and not large. Japan has initially set a limit of 500 Indonesian care-givers to be admitted to Japan. 208 care-

givers were accepted in the first year (2008). They finished their Japanese language education and began working in 98 Japanese hospitals and nursing homes in February 2009. It will not be evident how well the care-giver program is working for at least several years, when the Indonesian care-givers take the national care-giver examination and it will be clear whether this type of international labour recruitment is a possible option for filling Japan's needs for health care workers.

Although population ageing and shrinking offers a powerful push for changes in Japan's migration policy, with encouragement to expand international migration, any changes in immigration policy are controversial. Vogt's chapter shows, through the study of migration policies related to Indonesian care-givers, that policy shifts in Japan are complex and challenging.

Major Themes

Several common themes cut across the chapters in this volume. First of all, as is clear from the titles of chapters in this volume, migration takes many forms. The influx of Poles to Great Britain, of Chinese to Canada, and Germans to Italy have different causes and consequences. In each case, the motivation for the immigrants is to improve their situation, usually by finding a better job or to obtain a better quality of life. Immigration certainly helps the immigrants and their families, now as in the past. Immigrants also gain new skills, save money, learn new ideas, and often start new businesses and create jobs in their new destination. Immigrants also send considerable money back to their previous home country – $260 billion in remittances were sent home by immigrants in 2006, which is greater than foreign aid and investment for many developing countries.

Immigration affects the population in the new country of settlement. Immigrants not only add new residents, they also affect the destination country's fertility and mortality, as discussed in several chapters in this volume. Because most immigrants are young, their effects on fertility are particularly important because they often contribute more births to the population than their numbers might suggest.

The migration of people helps developed countries in many ways. Rich developed countries generally have below-replacement fertility that is leading to an older workforce. Indeed, many advanced countries actively compete for immigrants with high education and technical job skills. Countries also admit immigrants with low-skills, as noted in Vogt's chapter on the recruitment of Indonesian care-givers to Japan and Shapira's study of recent Eastern and Central European immigration to Great Britain.

Above all, discussion of current immigration requires some historical perspective. An honest appraisal of immigration over the past fifty years needs to acknowledge that immigration has not brought about the civic disturbances that

some pessimists have predicted. Rather, the lives of millions of immigrants have been dramatically improved and immigrants have enriched host countries culturally and economically. To be sure, immigrants with low-skills have competed with low-skilled domestic workers and this has depressed wages for some. But low-skilled workers were already at risk because of technology improvements and, in some instances, competition from foreign goods. The more appropriate public policy is to help all low-skilled workers improve their job skills and not to restrict immigration, which may result in negative effects on the whole economy.

Recent migration trends ensure that populations in developed countries will continue to be reshaped by both international and internal migration. Long-term internal migration will continue as people move from small towns and rural areas to larger towns and cities and from less to more attractive areas, depending on many factors including economic opportunities. In addition, international migration will continue to be a powerful demographic force, as thousands of people move between countries and alter the populations and societies of both sending and receiving areas. Future migration will also not merely mirror old patterns. For example, future migration is likely to include a greater proportion of highly-skilled workers moving within and between countries. It is also likely to be more diverse in multiple ways, encompassing more categories of migrants and more varied forms of migration flows that will, for example, expand transnational migrant communities. Migration, by definition, is dynamic and fluid. We can be sure that future research on migration will discover new forms and new consequences of this powerful demographic process.

The Contribution of Immigration to Population Growth

Barry Edmonston

Introduction

> "The population of the area now Canada has grown from 2,540,000 in 1851 to 13,728,000 in 1950, a multiplication by more than five in 99 years. A question frequently asked is how much of this growth has been the result of immigration from abroad, and how much the natural increase of residents." Nathan Keyfitz, Population Studies, 1950.

The question posed by Nathan Keyfitz in 1950 continues to interest demographers (Edmonston/Michalowski, 2004). The purpose of this paper is to review demographic approaches that have been proposed for measuring the contribution of immigration to population growth. The paper also presents one approach – a historical reconstruction of Canada's population – to illustrate a method that is useful for measuring the effect of immigration on population growth.

The population of Canada increased from 2.6 million in 1851 to 31.6 million in 2006, a twelve-fold increase in 155 years.[1] What has been the contribution of immigration to this population increase? One demographic answer to this question is to provide an estimate of total immigration. Such a calculation, however, ignores the effects of emigration and the contribution that immigration makes to population growth through fertility. A more complete answer would involve estimating the contribution made directly through both immigration and emigration, and indirectly by the childbearing of immigrants, as well as subsequent fertility by the descendents of immigrants. In providing an answer to the question about the contribution of immigration, this paper asks "what would have happened to population growth in Canada if there had been no immigration?"

---

[1] The data refer to the population in the current combined area of the provinces and territories of Canada, including Newfoundland. The formerly British colony of Newfoundland did not join Canada until 1949, so population figures cited in this paper add estimates for Newfoundland's population in order to provide comparable data for the present territory of Canada. The population of Newfoundland is relatively small, however, and does not have a substantial influence on Canada's population changes.

Immigration to Canada during the past five decades has had a gradual, cumulative impact on the foreign-born composition of Canadian society. The effect of the new immigrants on Canadian society has become increasingly apparent in recent years. How does the effect of recent immigration compare with earlier waves of new arrivals? This paper describes changes in the immigrant composition of Canada's population that have taken place since 1851, using a population projection methodology to quantify the effect of immigration on the composition of the Canadian population in terms of the generational stock. The next section presents an overview of different ways for measuring the contribution of immigration to population growth, followed by a description of the model of population change used in this paper to determine the effect of immigration on Canada's population change from 1851 to 2006.

1. Three Ways of Measuring Immigration Effects on Population Growth

Demographers have developed three ways of measuring the contribution of immigration to population growth. This section offers an overview of the types of studies within three broad groups: (1) studies of period change, (2) population projections, and (3) stationary population models. Some methods have been available for many years and some are more recent. Following this section, we discuss data sources, methods, and results for one specific method, which offers a historical reconstruction of Canada's population using a population projection model.

Immigration has many effects on the destination population. This paper limits attention to the effect of immigration on population size and growth. Other work on the effects of immigration has been concerned with the age distribution, population composition (such as family and household composition), school enrolments and educational attainment, and the labour force. This other work is too large to review or cite here (Smith/Edmonston (1997) discuss research on the fiscal, economic, and demographic effects of immigration, citing primarily U.S. studies).

1.1 Studies of Period Change

There are a variety of demographic approaches within the first broad approach for measuring immigration's contribution to population growth. This first group of approaches deals with studies of period change. These approaches focus on population change during a specific period of time, usually relying on census and other data to examine population change during a five or ten-year period. Their purpose is to estimate immigration – or immigration, emigration, and net immigration for

the period – and compare the contribution of immigration and natural increase to overall population change.

Classic Approach.
The classic approach for measurement of immigration for a period of time is illustrated by Keyfitz's (1950) study, which uses estimates of fertility and mortality in conjunction with Canadian censuses for 1851 to 1941 to estimate net immigration for each ten-year period. This approach is usually discussed in basic demographic methods for estimating immigration (see Edmonston/Michalowski, 2004) for discussion of the standard ways for estimating immigration for a period of time). In Keyfitz's work, he uses mortality tables to survive the population from one census to the next, by age and sex groups, and uses the difference between the expected and observed population to provide an estimate of net immigration. Then, using estimates of actual immigration (taken from border crossing observations and other official counts of international arrivals), he estimates emigration as the difference between immigration counts and estimated net immigration. Once he has estimates of net immigration of each ten-year period, Keyfitz calculates the proportion of population change due to immigration.

This approach is useful for providing estimates of net immigration by age, sex, and other fixed population characteristics, such as country of origin. The classic approach for estimating net immigration, however, requires fairly accurate census data and mortality tables.

Taking Fertility into Account.
One limitation in the classic approach for measuring the contribution of immigration to population changes for a period of time is that it neglects the contribution to population growth from births to immigrants. Campbell Gibson (1975, 1992) has proposed a useful approach that involves estimating births to immigration during the period of study. He assumes that the rate of natural increase during the period of study is the same for immigrants and the resident population. He starts with population census data, estimates of natural increase for the resident population, and mortality tables. After estimating net immigration in a similar way to that described above for the classic Keyfitz method, he uses estimates of natural increase for the resident population to derive estimates of natural increase for the arriving immigrants. This provides an estimate for the period of study for net immigration as well as the contribution to population change stemming from immigrants and births to immigrants.

There are two cautions about assuming that the natural increase for immigrants may be the same as for the resident population. First, the age structure of immigrants may be different and result in different numbers of births and deaths than expected. Second, fertility levels of immigrants may be different. If immigrants are

younger and have higher fertility levels than the resident population, for example, then the assumptions of the Gibson method would lead to underestimates of the contribution of immigration to population change for the period of study.

Consistent Census Correction.
A major challenge for estimating period measures for the contribution of immigration to population change is limited or poor quality data for the population by age and sex, fertility, or mortality. If census data are severely affected by undercoverage, for instance, this will adversely influence estimates of net immigration.

Norman Luther and colleagues (Luther et al., 1987) at the East-West Population Institute of the University of Hawaii have proposed an innovative method for dealing with limited data. This method uses limited or deficient data but assumes that the analyst is knowledgeable about data limitations and is able to make assumptions about specific data inadequacies. Because this approach provides consistent estimates for adjusted census data as well as birth, death, and migration counts,[2] it is called consistent census correction method by Luther and his colleagues. The method also provides adjusted estimates for net immigration.

The consistent census correction method begins by expressing a set of demographic balancing equations for the initial and ending populations by age and sex. There is an equation for each birth cohort for the intercensal period, including the effects of birth, death, net immigration, and census undercoverage. The analyst provides starting estimates for births, deaths, net immigration, and census undercoverage. Also required are estimates of preliminary correction factors as well as estimates of how reliable the analyst believes the correction factors to be (these are called the correction weights).

The consistent census correction method optimizes the dimensional vector space for the balancing equations to provide adjusted, final consistent estimates. There are many possible solutions for the balancing equations. The consistent census correction method finds one consistent solution. But, changing the initial correction factors or correction weights will result in different consistent solutions.[3]

---

2 The use of "consistent" in this approach has a special meaning. Demographers often make separate estimates for fertility, mortality, and international migration. The work of Luther and colleagues uses "consistency" to mean that population changes for an intercensal periods involve birth, death, and migration estimates that together match the observed population changes by age and sex. That is, the corrected estimates are internally consistent with the overall observed intercensal population changes.
3 Software for consistent census correction estimates can be downloaded from: www.eastwestcenter.org/research/research-program-overview/population-and-health/demographic-software-available-from-the-east-west-center/ as of September 6, 2008. Available for downloading are a user's manual and set of Fortran programs that will run in Microsoft's Windows system.

The consistent census correction method is a sensible approach if the analyst has reasonable data and can be confident about the initial correction factors and correction weights.

Birth Replacement Ratios.
A final method for estimating the contribution of immigration to period population change makes use of birth replacement ratios, which are calculated as the ratio of the number of births in a given year to the weighted mean of births of the previous generation of mothers; for a specific population, it can be interpreted as the ratio of current births to births that occurred about 20 to 40 years ago. Unlike standard fertility measures, such as the total fertility rate or the net reproduction rate, birth replacement ratios are affected by migration and offer useful, interesting interpretations of population changes for national and subnational populations that influenced by in- or out-migration.

The earliest expression of the uses of birth replacement ratios appears to be work by the Swedish demographer Hannes Hyrenius (1951, 1959). Hyrenius examined the differences between cohort and gross reproduction ratios, noting that in and out migration would affect the cohort replacement ratios. In recent years, Jose Antonio Ortega (2006) and Alberto del Rey and Ortega (no date) have used this insight to develop formal models of birth replacement ratios, including estimates of the effect of immigration. This volume includes a chapter by del Rey and Ortega that offers more detailed exposition of this new approach to studying the effects of migration on population dynamics.

1.2 Population Projections

The second general group of approaches for estimating the demographic effects of immigration involves the use of population projection models (see George et al. (2004) for a comprehensive discussion of population projections methods and data requirements), especially cohort-component population projections, which have long been the demographic workhorse for population forecasting.

All of the methods involving population projection models share a common framework. They start with birth cohorts, usually separate for males and females, and move them through time while making assumptions about fertility, mortality, and migration. We next review four different applications that use population projections for the study of immigration's contribution to population growth.

National Population Projections.
The first application is seen in national population projections. The analyst usually makes two or more projections for the national population. One projection assumes

zero net immigration and, then, one or more alternative projections are made with plausible assumptions about immigration. The assumptions might involve different levels for the amount of immigration and emigration, or different age-sex composition for net immigration. National population projections for the United States (see Edmonston/Passel, 1994b; Smith/Edmonston, 1997) present examples of this type of population projection.

The effect of immigration in this type of population involves a contrafactual comparison. The assumption of zero net immigration is made in order to provide a baseline comparison. The assumption of zero net immigration is not necessarily realistic but is required in order to interpret alternative projections. The contribution of immigration to population growth is, essentially, the difference between the zero net immigration and alternative immigration assumptions.

Immigrant Generation Population Projections.
A second application of population projections involves the use of a projection model incorporating immigrant generations, a model first proposed by Edmonston and Passel (1992). They describe a national population projection model for a population characterized by age, sex, and four immigrant generations: the foreign-born (the 1st generation), the sons and daughters of immigrants (the 2nd generation), the grandsons and granddaughters of immigrants (the 3rd generation), and all subsequent descendants (the 4th-plus generations).

The data requirements for an immigrant generation population projections are more demanding than standard national population projections because data are required on fertility, mortality, and migration for each generation.

Requiring such data for each generation has some advantages, however. Most standard national populations assume that immigrants acquire the fertility and mortality schedules of the resident population the instant that they arrive. This assumption is often unrealistic.

Immigrant generation population projections have several advantages. Most importantly, they present estimates for the population by immigrant generations, showing the number and characteristics of the foreign-born and their descendants.

Modified Immigration Generation Models.
Population projections can be used as the basis for more elaborate models to provide estimates for such topics as labour force numbers and characteristics, which is the third major application of population projections. Besides labour force projections, four other examples illustrate various adaptations of an immigrant generation population projection method.

First, language acquisition offers an example. In this example, immigrants and possibly the children of immigrants can be characterized in terms of speaking the official language of their new settlement country. Some immigrants might arrive

already able to speak the official language. For those who do not, transition probabilities for speaking the official language might include length of residence, age and sex, and educational attainment.

A second example comes from research on ethnicity and ethnic intermarriage. There are often differences in ethnic-origin between immigrants and the resident population. But, ethnic groups do not remain socially isolated from one another; intermarriage between ethnic groups means that population projections need to take intermarriage or exogamy into account (Lee/Boyd, 2008). Demographers have adapted the immigrant generation population projection model to incorporate exogamy in order to make ethnic population-based projections (Edmonston et al., 2001; Edmonston et al., 2002; Lee/Edmonston, 2006).

Third, Rogers and Raymer (2001) propose a multiregional population projection model to analyze changes in the elderly population for four regions of the United States. They use 1960, 1970, 1980, and 1990 census data, and assumptions about fertility, mortality, international migration, and interregional migration to study three sources of possible change in the regional elderly population: internal migration, ageing-in-place, and immigration.

A final example comes from the study of citizenship and nationality, and is illustrated by French demographer Michèle Tribalat's research (1991, 1992). Tribalat's work involves three immigrant generations. Immigrants arrive in France as foreign nationals and, by marriage or naturalization, acquire French nationality. With a few exceptions – for example, Algerians who are noted as second generation although not born in France – second and higher generations have French nationality. Tribalat's work involves historical reconstruction of the population and presents 1986 estimates for the French population by generation and nationality.

Historical Population Reconstruction.
The fourth example of population projections involves the reconstruction of past population changes. The purpose of this method is to disentangle the direct and indirect effects of immigration. It is a formal projection approach similar to the previously described method proposed by Gibson (1992). Using an immigrant generation framework, it allocates past population change to the direct effects of immigration – the result of immigration net of emigration – and the indirect effects that occur due to the natural increase of immigrants and their descendants (Edmonston and Passel (1994a) illustrate this approach with a historical reconstruction of the U.S. population, showing the long-term effects of immigration on the current racial/ethnic composition).[4]

---

4 Rogers et al. (1999) offer a useful alternative approach for historical population reconstruction, providing an application for the United States. Their approach is based on multiregional projection model that incorporates two nativity groups: foreign and native born.

One advantage of this approach is that analysts can calculate long-term population effects of immigration for different periods. For example, the historical reconstruction can show the results for the current population of immigration during an earlier period, such as 1951 to 1971. This application is presented in greater detail in later sections of this paper.

1.3 Stationary Population Models

Demographers have made use of stable population theory that incorporates the role of immigration to understand immigration's effect on population change. Some of these contributions have been primarily theoretical (Espenshade et al., 1982). Others have been fairly narrow, focussing on population momentum, for example (Keyfitz, 1970). Some have addressed fairly special questions, such as Keyfitz's (1971) paper dealing with the extent to which out-migration can offset high rates of natural increase. Most useful, for the purpose of understanding immigration's contribution to population growth, have been stationary population models (Edmonston 2009 presents a recent description of stationary population models and their uses for understanding the role of internal and international migration effects on Canadian provincial population growth).

Stationary population models have been used for several decades, with early work by Keyfitz (1969), Coale (1972) and more recent examples by Lachapelle (1990), Ryder (1997), and Edmonston (2006). The motivation of stationary population models is similar to that for the study of intrinsic rates: because most observed age structures are not stable, vital rates such as the crude birth and death rate can give a misleading picture of population dynamics (Vincent, 1946). Demographers face a similar problem when trying to understand immigration. The arrival of an older person, for example, who may have only a few years of life expectancy, adds only a few person-years to the population. The arrival of a young woman, on the other hand, has two important different effects on population growth. She has a much longer life expectancy and may add 60 or more person-years to the population. Even more critically, she is likely to have children and her children will have children. Stationary population models take into account both the age distribution of immigrants as well as their potential fertility contributions.

For stationary population models, the reference model is the assumption that the net reproduction rate (NRR) equals 1.0. All alternative assumptions are based on comparisons to the NRR=1.0 model, which is commonly called the stationary population equivalent model. Alternative assumptions are then made to understand how much current fertility and migration lead to differences in the long-term stationary population equivalent.

2. A Population Model of Immigrant Generations for Canada

The preceding section provides an overview of three different broad approaches to studying the role of immigration in population change. In this section, we describe the approach used in this paper to examine the contribution of immigration to Canada's population over the past 155 years. It uses the immigrant generation population projection model, described briefly above, for the historical reconstruction of Canada's population from 1851 to 2006.

The population estimates and estimated components of change presented in this paper are derived using the projection model developed by Edmonston and Passel (1992). The model uses a modified cohort-component methodology to develop population estimates by age, sex, and immigrant generation. The model keeps track of four generations: the first generation (i.e., the immigrants); the second generation (i.e., children of immigrants); the third generation (i.e., grandchildren of immigrants); and fourth-or-higher generations (i.e., persons whose most recent immigrant ancestor is at least a great-grandparent). The data presented in the paper follow the designations used in Canadian censuses: an individual's generation is defined by the most recent immigrant ancestor. Thus, an individual with one immigrant parent and one Canadian-born parent is a member of the second generation.

The demographic model combines data on fertility, mortality, immigration, and emigration to produce its population estimates (or projections). For this paper, this model was applied to the total population of Canada. The basic strategy for developing the estimates involved fitting information on each of the four components to the series of population counts from the decennial censuses of 1851 through 2006. The fitting involved an iterative process of progressively fitting the component series to the population targets. Because our interest is primarily in immigration, the targets for each date were the foreign-born population, the second-generation population (i.e., the Canadian-born population of foreign or mixed parentage in census parlance), and the third-and-higher generation population (i.e., the Canadian-born of Canadian-born parentage).[5]

In a standard cohort-component projection, we begin with a population age x at time t, P_x^t, survival rates for survival from age x to $x + 5$ during the period from t to $t + 5$, $S_x^{t,t+5}$, and age-specific fertility rates for women age x at time t, F_x^t. We assume five-year age groups, so a population age x represents the age group x to $x + 4$. To include international migration, we expand the basic model by defining in-

---

5 Although the demographic model is characterized by four immigrant generations, Canadian census data show, at most, results for the 1st, 2nd, and 3rd-plus generations. The actual fitting involves comparing model results for the combination of the 3rd and 4th-plus generations to census data for the 3rd-plus generations.

migrants age x during the period t to $t + 5$, $I_x^{t,t+5}$, and out-migrants age x during the period, $O_x^{t,t+5}$. Then, net migrants during the period are defined as $N_x^{t,t+5} = I_x^{t,t+5} - O_x^{t,t+5}$.[6] We assume that all demographic data and calculations are separate for males and females.

We can add an immigrant generations index to the basic model. Consider a population indexed by k generations, where $k = 1, 2, 3$, and 4: $k = 1$ the first generation, $k = 2$ indicates the second, $k = 3$ indicates the third, and $k = 4$ indicates the fourth and higher generations. The survival of the population alive at the beginning of the projection period, for all age groups but the last becomes

$$P_{x+5,k}^{t+5} = P_{x,k}^{t} S_{x,k}^{t,t+5} + \frac{N_{x,k}^{t,t+5}(1 + S_{x,k}^{t,t+5}) + N_{x+5,k}^{t,t+5}(1 + S_{x+5,k}^{t,t+5})}{4}.$$

For the open-ended age category, the survival rates are adjusted to define the survival from the open-ended age category in one period to the open-ended age category in the next period.

In general, the number of immigrants by generation is non-zero for the first generation and zero for the second and higher generations; immigrants are seldom Canadian-born persons. On the other hand, the model makes apparent that emigrants by generation may have non-zero values for all generations. Hence, observed values of net migrants by generation are usually positive for the first generation (representing net immigration of the foreign-born) and typically negative for the second and higher generations (indicating some emigration of the Canadian-born).

In a female-dominant model, a mother in the kth generation would produce an offspring in the k+1st generation. We use female-dominant to mean the model derives the generational characteristics of children from the mother. In other words, the generational membership of the father has no relevance for the offspring in the female dominant perspective. Since it is logically impossible for a mother to give birth to a foreign-born child while resident in Canada, the population aged 0 to 4 for the first generation would derive solely from immigration.

The female-dominant model does not correspond, however, to the generational classifications used in Canadian censuses because the census population is classified by the most recent immigrant ancestor. Thus, the second generation is normally designated as "the Canadian-born population of foreign or mixed parentage." More specifically, a 2nd, 3rd, or 4th generation female might marry an immigrant male;

---

6 Preston et al. (2001: Chapter 6) offers a useful presentation of the data and methods for simple cohort component population projections, including migration.

their children would report their ancestry relative to the father (the most recent immigrant generation of their parents) and would report themselves as 2nd generation.

Having introduced the notion of a female-dominant model, it can be modified to make it correspond to the most recent ancestor definition usually used in Canada and other national censuses. It might be thought that a first-generation mother would give birth to a second-generation offspring, a second-generation mother would give birth to a third-generation offspring, and a third-plus mother would always give birth to a third-plus offspring. In actuality, a woman may have a partner who is not of the same immigrant generation. If a woman has a partner who has more recent immigrant ancestry, the offspring's immigrant generation will depend on the partner's immigrant generation, rather than on the mother. For example, if a third-plus generation woman has a child with an immigrant father, then the child (according to census definitions) will be reported as second-generation. This immigration generation effects can be including in a population projection model with including a transition matrix that determines the immigrant generation of births from the joint immigrant generations of both mother and father.

Consider a matrix $G_{k, m}$ which indicates the proportion of births in the mth generation (m=1, 2, 3, 4) born to women in the kth generation. In the female dominant model, $G_{1, 2} = G_{2, 3} = G_{3, 4} = G_{4, 4} = 1$, and all other cells in the G matrix are zero. We have modelled the generational membership for recent birth cohorts and found that the following G matrix best fits observed 2001 census data: $G_{1, 2} = 1.00$, $G_{2, 2} = 0.13$, $G_{2, 3} = 0.87$, $G_{3, 3} = 0.08$, $G_{3, 4} = 0.92$, and $G_{4, 4} = 1.00$.

A model incorporating the G matrix for the population in the first five years of life is:

$$P_{0,4}^{t+5} = \sum_{k=1}^{4} \left[G_{k,m} \left(B_k^{t,t+5} \cdot \frac{S_{b,k}^{t,t+5} + S_{b,k+1}^{t,t+5}}{2} \right) \right] + \frac{N_{0,4}^{t,t+5}(1 + S_{b,4}^{t,t+5})}{4},$$

where $S_{b,k}^{t,t+5}$ represents the survival from birth to age 0-4 for the kth generation during the period t to t + 5 and the total births in the kth generation is calculated as:

$$B_k^{t,t+5} = 2.5 \sum_{x=15}^{45} P_{x,k-1}^{t}(F_{x,k-1}^{t} + S_{x,k-1}^{t,t+5} F_{x,k-1}^{t+5}) + B_{I,k}^{t,t+5},$$

where $B_{I,k}^{t,t+5}$ represents the births to net immigrants during the period.

The following sources of data were used for the population reconstruction:

1) Age-sex population data were taken from Canadian population censuses from 1851 to 2006. Appendix A provides information about adjustments to census information.

2) Population totals for the Canadian-born and foreign-born were obtained from population censuses since 1871. Age-sex data on the Canadian-born and foreign-born were available from censuses since 1921.

3) Mortality data were obtained from two sources: life table survival values were obtained from Keyfitz (1950) for 1851 to 1941 and life tables were used from Dominion Bureau of Statistics and Statistics Canada publications, for various years, for 1941 to 2006.

4) Fertility data relied primarily on Henripin (1982) for estimates of crude birth rates and age-specific fertility rates for the 1851 to 1951 period. Dominion Bureau of Statistics and Statistics Canada publications, for various years, were consulted for fertility estimates after 1951. Basavarajappa (1993), Ram and George (1993), and Bélanger and Gilbert (2003) were consulted for information on fertility levels by nativity for the 1961 to 2006 period.

5) Estimates for immigration and emigration began with five-year estimates published by Statistics Canada (1993). As described in Appendix B, different estimates were used for years in the late nineteenth century. The age-sex distribution of immigrants and emigrants were taken from distributions for net migrants for 1851 to 1941 in Keyfitz (1950); data for more recent years were taken from information provided in Statistics Canada's Annual Demographic Statistics.

Population data by age and sex were fitted for decennial years from 1851 to 1951 and for every five years since 1951. Generational age-sex distributions were fitted to available data: (a) age-sex tabulations are available for the 1851 and 1861 censuses, (b) population totals for the Canadian-born and foreign-born are available from the 1871 to 1911 censuses, and (c) age and sex of the Canadian-born and foreign-born are given in censuses since 1921. In addition, age and sex data are available on the Canadian-born of foreign-born parents (the second generation) in the 1921, 1931, 1971, 2001, and 2006 censuses; subtracting information on the second generation from the total Canadian-born population yields estimates for the third-plus generation.

The result of the fitting process is a detailed set of fertility, mortality, and immigration and emigration estimates for each 5-year period in the interval 1851 to 2006 for each of the four immigrant generations by age and sex. Because the focus of this paper is on international migration, we present only the immigration and emigration estimates.

We first used the population projection model to fit the time series of Canada's population by age, sex, and immigrant generations based on census data. Then, to study the effect of immigration on population growth in Canada from 1851 to 2006, we use the model to address the contrafactual question "What would have happened if immigration had not occurred?" In the model, we first calculate a zero-immigration scenario, setting both the immigration and emigration component (emigration is limited to the foreign-born for this assumption, which means that emigration of the Canadian-born may occur) to zero for a period and hold all other components fixed. This "experiment" – that is, the difference between the zero-immigration scenario and the actual case – provides an estimate of the overall effect of immigration in combination with the future generations born to immigrants. Such an estimate is, hence, a measure of the overall direct and indirect effects of immigration on population growth.

3. Historical Trends

Immigrants have settled in Canada throughout its entire national history. In fact, immigrants from Asia and Europe had come to the present territory of Canada long before Canada's national confederation in 1867. During the past 155 years, the number of immigrants coming to Canada has been quite high compared with other immigrant flows throughout the world. Only Australia and United States have experienced comparable heavy immigration, albeit greater numbers of immigrants have moved to the much larger U.S. population. Since 1851, immigration flows to Canada have averaged around 120,000 arrivals per year, with a great deal of variation from the peaks of the 1900s, 1910s, and 1950s to the valleys of the 1930s.

3.1 Immigration Since 1851

Figure 1 traces the history of immigration to Canada since the inception of population censuses for Canada in 1851 (unless noted otherwise, immigration and emigration figures are derived by the author, see Appendix B; additional description of Canadian immigration trends is offered by Beaujot and Rappak (1988), Simmons (1995) and Boyd (2009). This chart shows the immigration boom that occurred during the early decades of the twentieth century through the 1920s. Immigration from Europe was especially large during this period, which was a time of population settlement in the Prairie Provinces and rapid urbanization and industrialization throughout Canada. The peak year for admission of immigrants to Canada was 1913, when slightly over 400,000 immigrants entered and added more than 5 per cent to the Canadian population in that one year alone. The 1880 to 1930 period

includes prolonged large-scale immigration from Europe to Canada; during this fifty-year period, immigration exceeded 10 immigrants per 1,000 population, with much higher rates in the late 1880s and from 1900 to 1914.

Figure 1:   International migration to Canada (in 1,000s), by decade: 1851-2006
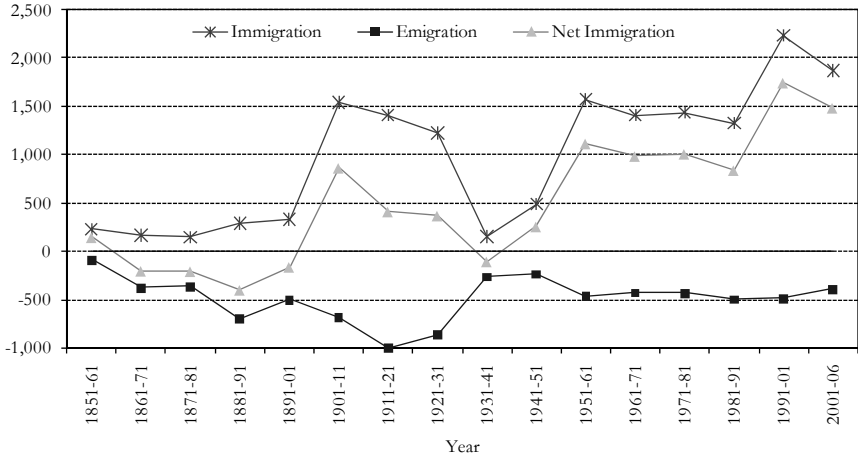
Note: In order to show comparable results for every decade, the observed immigration, emigration, and net immigration numbers for 2001-2006 are doubled, providing estimates for 2001-2011 that assume current trends continue.

The five-year period of 1909 to 1913 witnessed the largest volume of Canadian immigration, in both absolute and relative terms, with the arrival of 1.6 million immigrants, or over 300,000 annually. By 1913, over one-fifth of the Canadian population had arrived in the preceding five years. Limiting attention to the foreign-born population in 1913, over one-half had arrived in Canada in the prior five years.

Immigration levels declined during World War I and increased in the early 1920s. As economic conditions worsened in Europe in the 1920s, migration to Canada increased after 1918, averaging about 100,000 immigrants in the early 1920s and almost 150,000 immigrants in the late 1920s. In contrast, few immigrants came during the 1930s Depression and World War II. There were only about 15,000 immigrants arriving per year, on average, in the 1930s and the numbers decreased even further during World War II, to a low of 7,500 immigrants in 1942. At the same time, there was substantial emigration from Canada during the 1930s, resulting in net outmigration during the Depression years.

Immigration increased steadily in the decades after World War II because Canada enjoyed a high degree of political freedom and economic prosperity, compared with Europe and many other parts of the world. Available employment in the expanding manufacturing, resource, and construction sectors of the Canadian economy gave ample opportunities for a new wave of immigrants. The 1967 changes in immigration law, including the elimination of national preference policies that favoured immigration from European countries, prompted even further increases as Canada began to receive new immigrants from Asia and Latin America. After 1967, equal preference was given to applications from any country, based on evaluation of a point system for individual characteristics (higher points were given to younger adults, persons who spoke English or French, and those having higher education or occupation skills needed in Canada).

Immigration has had considerable impact on population growth in Canada during the past 155 years. To appreciate fully the impact of immigration, however, it is necessary to take into account the effect of emigration as well as immigration. Emigration offsets the population gains stemming from immigration. Moreover, the number of emigrants has changed substantially during the past century. Figure 1 and Table 1 presents estimates for immigration, emigration, and net immigration (immigration minus emigration) from 1851 to 2006.

Emigration reached a peak of about 680,000 per decade in the first two decades of the twentieth century. Current levels of emigration are now considerably less, both in numerical and percentage terms. There were about 440,000 emigrants over the 1991-2001 decade. As a result, the gains from net immigration today are almost twice as large as in the first decade of the 20th century. In the decade ending in 1911, there were 1,544,000 immigrants and 680,000 emigrants, producing net immigration of 864,000. For the decade ending in 2001, there were almost 2,234,000 immigrants and 488,000 emigrants, yielding a net immigration gain of 1,746,000, almost twice as high as the net migration for 1901-1911. Thus, compared with early in the 20th century, immigration levels are moderately higher; emigration is considerably lower; and net immigration is almost twice as large.

Since Canada's population has grown considerably since 1851, it is important to consider the volume of immigration compared to population size in assessing the total impact of net immigration. Since 1851, when Canada's population numbered 2.6 million, the population has increased twelve-fold to 31.6 million in 2006. Has immigration increased at a comparable rate? The answer is clearly no. As shown in Table 1, immigration relative to population size is now about one third of the peak levels in the first decade of the twentieth century. Immigration during the 1901-1911 decade, for example, amounted to 27.7 per cent of the 1901 population. The comparable figure for 1991-2001 is 7.5 per cent. Relative net immigration levels are also lower than earlier in the 20th century. Net immigration during 1991-2001 is 5.8 per cent of the population at the beginning of the decade, compared with 15.5

per cent during the 1901-1911 decade. The differences are slightly less for net immigration than for gross immigration alone because of the much higher levels of emigration (both in relative and absolute terms) early in the twentieth century.

Another way to look at immigration and population change is to ask a somewhat different question: "How much of population increase is due to immigration?" Table 1 also shows net immigration as a percentage of population change during the decade. During 2001-2006, for example, the population grew by 2.0 million. Net immigration for the five-year period was 743,000, or 38 per cent of the population change for 2001-2006. The trends in Table 1 reveal that immigration provided almost half (46 per cent) of population increase during 1901 to 1911, but then diminished to levels of only 12 per cent during 1941 to 1951. Immigration now provides a greater proportion of population growth than in previous decades. The population dynamics are somewhat different, however. Immigration is now at a much lower rate than at the turn of the 20th century, but lower overall fertility rates produce lower levels of natural increase. In the current situation, immigration plays a greater role in overall population growth.

3.2 Population by Immigrant Generations

The reconstruction of the Canadian population presents a view of immigrant generations over time. Figure 2 displays estimates for Canada's population for each census year, 1851 to 2006, for four immigrant generations. The sum of the generations is the actual census population count. The lowest bar, in the darkest shading, is the reconstruction of the foreign-born population. Each component, comparing the horizontal areas in the chart, is a successive immigrant generation. This chart emphasizes that Canada has been heavily influenced by immigration during the past 155 years. The first three immigrant generations – the foreign-born born and their children and grandchildren – have been important components of the Canadian population throughout the 1851 to 2006 period.

Because the Canadian population experienced substantial increase from 1851 to 2006, Figure 3 shows the percentage distribution of immigrant generations. This chart reveals fluctuations in the immigrant generation composition of the population, in reaction to long-term shifts in immigration. The 1851 population exhibits the effects of immigration during the previous 50 to 60 years because both the foreign-born and the second generation are relatively large, while the third generation does not show pronounced evidence that the second generation has been contributing significant childbearing. From 1851 to 1901, the proportion foreign-born diminished, while the second generation declined modestly, and the third generation increased. Overall, the fourth-plus generations diminished as a proportion of the total population from 1851 to 1871 and then increased moderately until 1901.

Table 1:   Canadian immigration and population change (in 1,000s) by decade, 1851-2006

Date	Population[8]	Change from Net	Amount Immigra-tion	Amount Emigra-tion	Amount Net	Per cent[7] Immigra-tion	Per cent[7] Emigra-tion	Per cent[7] Net	Net Immigration
1851	2,645	--	--	--	--	--	--	--	--
1861	3,453	808	231	86	145	8.7	-3.2	5.5	18.0
1871	3,827	374	175	377	-202	5.1	-10.9	-5.8	X.[9]
1881	4,481	654	155	361	-206	4.0	-9.4	-5.4	X.
1891	5,009	528	296	695	-399	6.6	-15.5	-8.9	X.
1901	5,569	560	339	500	-161	6.8	-10.0	-3.2	X.
1911	7,430	1,861	1,544	680	864	27.7	-12.2	15.5	46.4
1921	9,040	1,610	1,412	1,000	412	19.0	-13.5	5.5	26.0
1931	10,661	1,621	1,230	860	370	13.6	-9.5	4.1	22.8
1941	11,827	1,166	157	262	-105	1.5	-2.5	-1.0	X.
1951	14,009	2,182	491	234	257	4.2	-2.0	2.2	11.8
1961	18,238	4,229	1,578	462	1,116	11.3	-3.3	8.0	26.4
1971	21,568	3,330	1,410	424	986	7.7	-2.3	5.4	29.6
1981	24,343	2,775	1,441	432	1,009	6.7	-2.0	4.7	41.4
1991	26,994	2,651	1,332	495	837	5.5	-2.0	3.4	31.0
2001	29,639	2,645	2,234	488	1,746	7.5	-1.6	5.8	66.0
2006[10]	31,613	1,974	937	194	743	3.0	-0.6	2.4	37.6

7 Net immigration, immigration, and emigration are expressed as a percentage of the population at the beginning of the decade.
8 The population figures include the population of Newfoundland, though Newfoundland did not joint Canada until 1949, and a correction for undercount of native peoples in 1851 and 1861. Appendix A describes the rationale and estimation for these adjustments.
9 Net immigration is negative and reduced total population change in the prior decade.
10 For 2006, the table shows population changes during the preceding five years.

As a result of prolonged and heavy immigration in the first three decades of the twentieth century, the proportion foreign-born increased and, afterwards, the second and third generations increased. Nevertheless, the proportion of the total population in the fourth-plus generations increased modestly after 1921, and remained at relatively constant levels since about 1951. We turn next to a more detailed explication of changes in the foreign-born and foreign-stock populations (the foreign-stock includes both the 1st and 2nd immigrant generations).

Figure 2:   Population by immigrant generations (in millions), Canada, 1851-2006
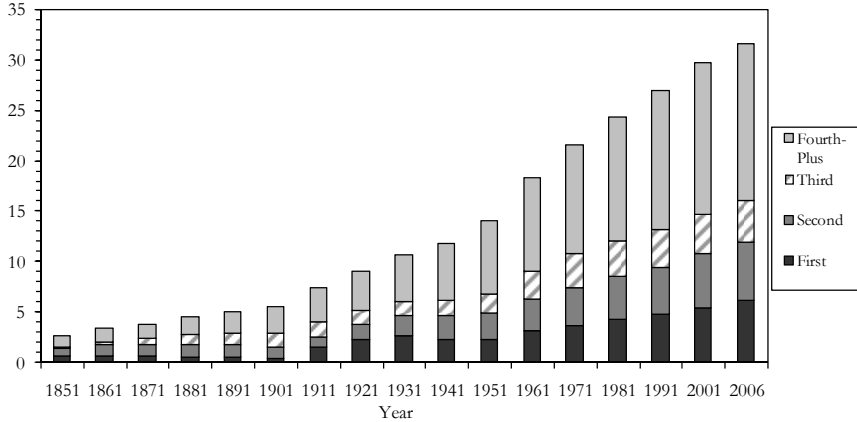
3.3 Foreign-born and Foreign-stock Population

As immigrants enter the country, they affect the composition of the population in several ways. They change the age, sex, and ethnic makeup of the population if they differ from the resident population. Immigrants always affect the generational com-position because they increase the size of the first generation – that is, the foreign-born population of the country. The size of the foreign-born population derives principally from past levels of immigration but is also affected by the effects of emigration and mortality. High levels of recent immigration, with little emigration, increase the number of foreign-born persons in the population. As time passes, the effect of mortality begins to diminish immigrant entry-cohorts (that is, immigrants who entered during a specific period of time) so that the foreign-born numbers decrease if not replenished by additional immigrants. Eventually, after about a century, the effect of mortality extinguishes the original immigrant entry-cohorts.

Figure 3:   Population composition by immigrant generations, Canada, 1851-2006
                  (per cent of total population)
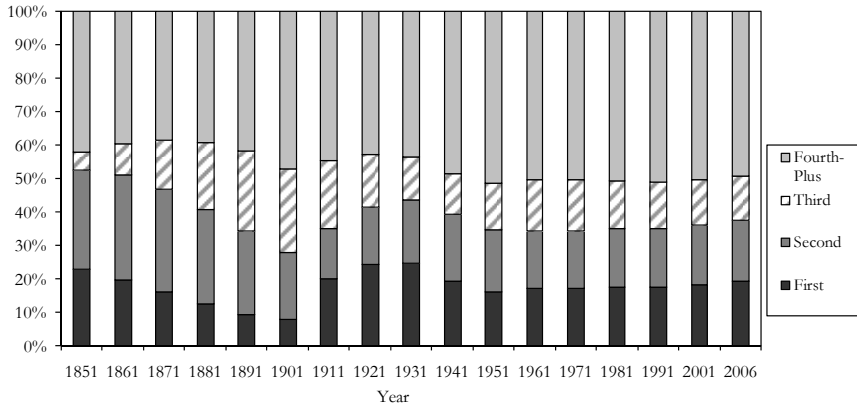
The size of the foreign-born population in Canada reflects the changing course of immigration over time. Table 2 displays the number of foreign-born persons and their proportion of the total population for the period since 1851. Approximately 608,000 foreign-born persons resided in the current territory of Canada in 1851, constituting 23.0 per cent of the total population. The number and proportion foreign-born gradually diminished during 1851 to 1901 because of a combination of net emigration of foreign-born and mortality (Canadian-born persons also experience mortality, but are able to replace themselves through childbearing). With the continuing heavy volume of immigration in the early twentieth century, the foreign-born population grew steadily, reaching a peak of about 2.7 million in 1931. At the same time, the foreign-born population increased as a proportion of the Canadian population reaching a level of 25 per cent in 1931. During the period of heavy immigration earlier in the 20th century, the foreign-born population remained at roughly 20 to 25 per cent (over one-fifth) of the population from 1911 to about 1941 because the Canadian-born population grew at about the same rate as the foreign-born population during that period.

With the diminution of immigration during the Depression and World War II, the foreign-born population decreased in both numbers and proportions as mortality reduced the aging wave of immigrants from earlier periods. The number of foreign-born residents in Canada declined from 1931 to 1951. By 1951, the foreign-born population had decreased to 2.3 million, about 400,000 less than the previous peak number of 2.7 million in 1931. The proportion of foreign-born in the total population also began decreasing after 1931, as the Canadian-born population grew

more rapidly. The foreign-born population as a percentage of the total population reached a minimum in 1951, when it accounted for 16 per cent, or 1 out of every 6 Canadians.

The large increase in immigration that began in the 1950s produced a turn-around in the 20-year decrease of the foreign-born population. A substantial increase was evident in the 1961 Census, and growth continued to the present. By 2006, the number of foreign-born persons residing in Canada reached the highest levels in the history of the country, more than 6.2 million. Relative to the rest of the population, however, the percentage foreign-born population is only three-fourths of the highest levels attained from 1911 to 1941: slightly less than 20 per cent of the population was foreign-born in 2006 versus about 25 per cent in 1921 and 1931.

The foreign-stock population includes the foreign-born population plus the second generation (the children of at least one immigrant parent). These two generations are crucial to the understanding of cultural patterns in a population because they tend to be the population segment with the strongest foreign language and cultural experience. Specifically, the immigrant generation (i.e., foreign-born population) often speaks a language other than English or French as a home language and tends to retain fairly close ties with their ancestral country. The second generation (i.e., the children of immigrants) has historically been the crucial one for adaptation to Canadian society.

Figure 4:   Contribution of 1851 population and selected immigrant entry-cohorts to total population (in millions), Canada, 1851-2006
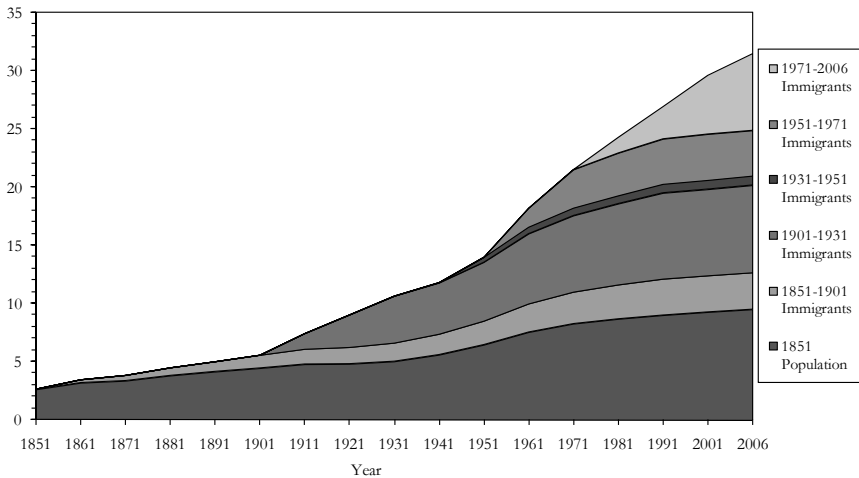
Table 2: Canadian population by immigrant generations (in 1,000s), 1851-2006

Year	Total Population[11] Number	Foreign-Stock Population Total Foreign-Stock Number	Per cent	Foreign-Born Number	Per cent	Canadian-born of Foreign or Mixed Parents Number	Per cent	Canadian-Born of Canadian-Born Parents Third Generation Number	Per cent	Fourth-Plus Generation Number	Per cent
1851	2,645	1,397	52.8	608	23.0	788	29.8	142	5.4	1,107	41.9
1861	3,453	1,775	51.4	687	19.9	1,088	31.5	315	9.1	1,362	39.4
1871	3,827	1,792	46.8	622	16.2	1,170	30.6	567	14.8	1,467	38.3
1881	4,481	1,829	40.8	571	12.7	1,258	28.1	900	20.1	1,752	39.1
1891	5,009	1,732	34.6	485	9.7	1,248	24.9	,184	23.6	2,092	41.8
1901	5,569	1,564	28.1	442	7.9	1,121	20.1	1,383	24.8	2,622	47.1
1911	7,430	2,596	34.9	1,485	20.0	1,111	14.9	1,499	20.2	3,299	44.4
1921	9,040	3,754	41.5	2,222	24.6	1,533	17.0	1,439	15.9	3,847	42.6
1931	10,661	4,666	43.8	2,663	25.0	2,003	18.8	1,354	12.7	4,641	43.5
1941	11,827	4,655	39.4	2,316	19.6	2,339	19.8	1,456	12.3	5,716	48.3
1951	14,009	4,858	34.7	2,281	16.3	2,577	18.4	1,987	14.2	7,165	51.1
1961	18,238	6,268	34.4	3,159	17.3	3,108	17.0	2,827	15.5	9,142	50.1
1971	21,568	7,469	34.6	3,717	17.2	3,751	17.4	3,298	15.3	10,803	50.1
1981	24,343	8,581	35.2	4,292	17.6	4,289	17.6	3,505	14.4	12,255	50.3
1991	26,994	9,460	35.0	4,785	17.7	4,675	17.3	3,770	14.0	13,762	51.0
2001	29,639	10,767	36.3	5,448	18.4	5,319	17.9	3,956	13.3	14,916	50.3
2006	31,613	11,946	37.8	6,187	19.6	5,759	18.2	4,093	12.9	15,574	49.3

11   The total population includes estimates for the population of Newfoundland for 1851 to 1941. Because of inclusion of Newfoundland's population, prior to joining Canada in 1949, and adjustments for undercount of native peoples in the censuses of 1851 and 1861, the total population figures vary slightly from those reported in Canadian census enumerations.

The dynamics of the foreign-stock population resemble those of the foreign-born, although with a time lag because of reproduction and mortality for the second generation. The foreign-stock population peaked at 4.7 million in 1931 and remained relatively constant until 1951. As a result of the upturn in immigration that began after World War II, the foreign-stock population began to increase, reaching 11.9 million in 2006. Proportionately, however, the foreign-stock population was at its highest level – about 44 per cent of the total population – in 1931. The proportion foreign-stock declined until 1951, remained slightly above one-third of the total population from 1951 to 1971, and increased modestly in recent decades. Currently, the estimated foreign-stock population accounts for about 38 per cent of the total population, or slightly less than 90 per cent of the peak level of 44 per cent in 1931.

The foreign-stock population has increased in the post-World War II era principally because of increases in the first, or immigrant, generation. The second generation hovered at about 1.1 to 1.3 million from 1861 to 1911. With the rapid increase of immigration in the first decades of the 20th century, there was a subsequent growth in the second generation after 1911, a growth that has continued to the present.

Relative to the rest of the population, the second generation was relatively larger in 1851, comprising more than one-fourth of Canada's population. The proportion in the second generation diminished until 1911, at 15 per cent, and increased to a level of 20 per cent in 1941. The proportion of Canada's population in the second generations has been stable in the range of 17 to 18 per cent since 1951.

4. Immigration's Contribution to Population Growth

The preceding sections discussed changes in the number and composition of immigrant generations, especially the foreign-born and foreign-stock, in Canada's population. This section examines the contribution of immigration to population growth, including how immigration has affected population changes. Immigration affects a population demographically in two ways: directly, through the contribution of new members (immigrants) to the population and, indirectly, through future births to the immigrants and their descendants. To measure the first effect, we need to take into account net immigration (the number of immigrants minus the number of emigrants). To measure the second effect, we must examine the reproduction of the population after the immigration has occurred.

The effect of immigrants on future reproduction in a population is a function of their age and sex, levels of childbearing, and mortality rates. Determining their effect, thus, requires a population model that disaggregates the population by age, sex, and generation and takes into account the four components of population change: immigration, emigration, fertility, and mortality.

From 1851 to 2006, the total population of Canada increased from 2.6 million to 31.6 million, an average annual rate of 1.6 per cent. Figure 4 displays the effect of immigration on the size of Canada's population for the period from 1851 to 2006. This graph shows the contribution of immigration to population for five key periods of immigration: 1851-1901, 1901-1931, 1931-1951, 1951-1971, and 1971-2006. The overall graph represents the growth of the total population from 1851 to 2006. The darker, bottom portion of the graph shows the hypothetical population size under conditions of no immigration since 1851. The different shaded components in the upper portions of the graph show the population growth attributable to different waves of immigrants and their descendants.

Detailed tables containing the supporting numerical data are presented in Appendix C as Tables C.1 through C.4. Table 3 contains extracts from these detailed tables. These numbers, derived from this paper's demographic modelling, represent demographic constructs, not genealogical derivations. For example, 20.9 per cent of Canada's population of 31.6 million in 2006, or about 6.6 million people, can be attributed to immigrants who entered the country since 1971 and their offspring (the top band in Figure 4). Because immigrants sometimes marry Canadian-born residents, however, the number of people in the Canadian population with immigrant ancestries is actually greater. The 6.6 million represents a demographic contrafactual answer to the question: "If no immigration to Canada had occurred between 1971 and 2006, how much less would Canada's population have been in 2006?"

As shown in Figure 4, the 2006 Canada population would have numbered 9.6 million (or 30.2 per cent of the observed 2006 population) if there had been no immigration since 1851. Immigration in the later half of the nineteenth century, from 1851 to 1901, was characterized by modest immigration and moderate emigration, and yielded net out-migration from Canada. Altogether, immigration during 1851-1901 contributed 3.1 million persons to the 2006 Canada population, or 9.9 per cent of the 2006 population. Immigration during the 1901-1931 period contributed about 7.5 million people to the 2006 population, or 23.8 per cent of the total population. Immigration during 1931-1951 provided a relatively small contribution; the period contributed .8 million, or only about 2.6 per cent of the total 2006 population. Immigration from 1951 to 1971 contributed 3.9 million persons, or 12.4 per cent of the 2006 Canadian population.

Immigration during the last 35 years, from 1971 to 2006, has, in fact, produced a slightly smaller impact on the 2006 population than the first 30 years of this century. Immigration from 1971 to 2006 has contributed 6.6 million persons, or 20.9 per cent of the 2006 Canadian population. Thus, as of 2006, the 1901-1931 immigrant

cohorts have had somewhat greater overall impact than all of the post-1971 immigrants.

Table 3: Contribution of the 1851 population and post-1851 immigration to the population of Canada in 1851, 1901, 1931, 1951, 1971, and 2006 (population in 1,000s)

Contribution from Component	2006	1971	1951	1931	1901	1851
Contribution to Population Size From:						
Estimated Population	31,613	21,658	14,009	10,661	5,569	2,645
1851 Population	9,588	8,313	6,501	5,063	4,479	2,645
1st Generation	0	0	0	2	85	607
2nd Generation	0	2	25	167	637	788
3rd Generation	0	126	429	734	1,195	142
4th+ Generations	9,558	8,185	6,047	4,161	2,561	1,107
Immigration Since 1851	22,055	13,255	7,508	5,598	1,090	(X)
1851-1901 Immigrants	3,139	2,710	2,01	1,558	1,090	
1901-1931 Immigrants	7,531	6,585	5,066	4,040		
1931-1951 Immigrants	809	662	432			
1951-1971 Immigrants	3,912	3,298				
1971-2006 Immigrants	6,606					
Per cent Contribution to Population Size From:						
Total	100.0	100.0	100.0	100.0	100.0	100.0
1851 Population	30.2	38.5	46.4	47.5	80.4	100.0
1st Generation	0.0	0.0	0.0	0.0	1.5	23.0
2nd Generation	0.0	0.0	0.2	1.6	11.4	29.8
3rd Generation	0.0	0.6	3.1	6.9	21.5	15.4
4th+ Generations	30.2	37.9	43.2	39.0	46.0	41.9
Immigration Since 1851	69.8	61.5	53.6	52.5	19.6	(X)
1851-1901 Immigrants	9.9	12.5	14.3	14.6	19.6	
1901-1931 Immigrants	23.8	30.4	36.2	37.9		
1931-1951 Immigrants	2.6	3.1	3.1			
1951-1971 Immigrants	12.4	15.2				
1971-2006 Immigrants	20.9					
Per cent Contribution to Population Growth Since 1851 From:						
Population Growth Since 1851	28,968	18,504	11,351	8,010	2,931	(X)
Total	100.0	100.0	100.0	100.0	100.0	(X)
1851 Population	23.9	29.7	33.8	30.0	62.6	(X)
Immigration Since 1851	76.1	70.3	66.2	70.0	37.4	(X)

5. Conclusion

Important changes in immigration to Canada over the past five decades will have a gradual, cumulative effect on the future age, sex, and ethnic composition of Canadian society. In some ways, the effects of recent immigrants have been moderate up to this moment. The new immigrants and especially their children have acquired English and/or French language skills and adjusted to Canadian society. Many have secured Canadian citizenship and begun to vote in elections. One recent immigrant, Adrienne Clarkson from Hong Kong, has served as Governor-General of Canada and Michaëlle Jean from Haiti is the current Governor-General of Canada. Further changes can be expected in the future. Also, while recent immigrants have been concentrated in a few provinces and major metropolitan areas, they are likely, based on historical experience, to disperse in future generations.

Large as the recent immigration may seem to some observers, has Canadian society ever experienced similar change? During the early decades of the 20th century, some worried about the dramatic increase of "new" immigrants from eastern and southern Europe. How does this earlier wave of immigration compare to the current one?

Consider an earlier period, from 1901 to 1931. During this period, 4.2 million immigrants arrived in Canada and, by 1931, they and their descendants comprised almost 38 per cent of the 1931 population. Although many of these immigrants have died in recent decades, a few remaining immigrants and descendants of the original 1901-1931 immigrants account for almost one-fourth of Canada's 2006 population.

We can make a similar comparison for the 35-year period from 1971 to 2006. During this recent period, 6.0 million immigrants entered Canada, about 40 per cent more than early in the 20th century. These immigrants made up 20.9 per cent of the 2006 population, about two-thirds of the contribution made by 1901-1931 immigrants to the 1931 population. Put in perspective, the volume of recent immigration has contributed somewhat less to the Canadian population, albeit recent immigration accounts for more than one-third of population growth because of relatively low fertility of the Canadian-born population. And, in terms of the 2006 population, slightly more of the current population size is attributable to 1901-1931 immigration than to 1971-2006 immigration.

As a result of the changing composition of the foreign-born population and high levels of immigration, Canada has also experienced shifts in the ethnic origins of its population (Lee, 2009). Today's immigration patterns continue to change the ethnic composition of the population. The effect of past and continuing immigration on the future population of Canada will depend on three key demographic changes that are already taking place.

First, the European-origin population of Canada is large but aging and growing slowly because of low fertility and low immigration. This population is composed largely of descendants of those who arrived before 1851, the large wave of immigrants during 1901 to 1931, and the last smaller wave in the initial decades after World War II. Census data reveal that the absolute number of European-born persons in Canada peaked in the 1930s and has declined steadily since then. Over the next decades, the European-born population in Canada will diminish, and European ethnic communities will become relatively less numerous. The source of new immigrant communities will continue to shift to Asia, Latin America, and the Caribbean.

Like previous waves of immigrants, Canada's newest immigrants are not evenly distributed across Canada. New immigrant communities tend to be concentrated in only a few places. Most recent immigrants choose metropolitan destinations, especially the large metropolises of Toronto, Vancouver, and Montreal. These are the areas where the new immigrants settle and are the places where the new ethnic communities are developing.

Third, the ethnic makeup of Canada's population is likely to continue to change. However, the demographic consequences of current patterns of immigration are difficult to assess. Even knowing the number of immigrants by country of origin is difficult because of questions concerning the levels of return migration and emigration to other countries. Significant questions about the fertility and mortality levels of new immigrant groups remain unanswered. In addition, intermarriage levels are typically related to length of residence in Canada and it is difficult to forecast possibly changing levels in the future. Intermarriage will have a pronounced effect on single-origin ethnic communities (Lee/Boyd, 2008).

Canada's population growth is slowing down for two reasons. Substantial fertility declines during the 1960s and 1970s have had the greatest effect. Even though immigration levels have been at moderate levels during recent years – with 30 per cent and more of annual Canada population growth deriving from immigration – until recently, immigration has not been sufficient to counterbalance the long-term effects of declines in natural increase. Correspondingly, the rate of natural increase among Canada's recent immigrants provides a rising proportion of the national population growth, primarily because they are an increasing proportion of the Canadian population.

Past trends and recent immigration legislation suggest continued moderate levels of immigration for the next decades.[12] We can also anticipate that there will be a

---

12   Statistics Canada's most recent population projections (Bélanger et al., 2005) provide evidence for the future course of Canada's population; Henripin and Pelletier (1986), George, et al., (1991), Beaujot (1997); Simmons (1995), and Simmons (2009) offer useful perspectives on alternative immigration assumptions and their implications for Canada's future population.

sustained high proportion of immigrants arriving from the countries of Asia, Latin America, and the Caribbean. New flows from other sources may also occur. At this time, the principal major alteration to the current patterns appears to be potential changes in flows from China and South Asia, the largest sources for Canada's recent immigrants. Such changes are difficult to predict because of uncertainty about the changes that might occur in political and economic conditions and the response of Canada.

The contribution of immigration to total population growth in Canada, directly through immigration but also indirectly through subsequent childbearing, will increase the relative proportion of the new immigrant groups in the Canadian population. Although recent immigration has not had a large relative effect on Canada's population, compared to the large-scale immigration of the early 1900s, there is no doubt that the response to the new immigrants will be a major determinant of the country's future, as it has been in the past.

References

Basavarajappa, K.G. (1993): Fertility Transition Among Immigrants in Canada, 1961-1991. Paper presented at the 22nd General Conference of the International Union for the Scientific Study of Population, Montreal, 24 August - 1 September.

Beaujot, R. (1997): Comportements démographiques et statut socio-économique des immigrants canadiens. Pp. 147-163 In: Rallu J.-S./ Courbage Y./ Piché V. (eds.): Anciennes et nouvelles Minorités. Montrouge: Institut National d'Études Démographiques (INED), 147-163.

Beaujot, R./ Rappak, J.P. (1988): The Evolution of Immigrant Cohorts. In: Halli S.S./ Trovato F./ Driedger L. (eds.): Ethnic Demography. Ottawa: Carleton University Press, 111-140.

Bélanger, A./ Gilbert, S. (2003): Immigrant Women and Their Canadian-Born Daughters. In: Bélanger, A. (ed.): Report on the Demographic Situation in Canada 2002. Ottawa: Ministry of Industry, 127-151.

Bélanger, A./ Martel, L., Caron-Malenfant, E. (2005): Population Projections for Canada, Provinces and Territories: 2005-2031. Catalogue no. 91-520-XIE. Ottawa: Ministry of Industry.

Boyd, M./ (2009): Immigrants in Canada: Trends and Issues. In: Edmonston, B/ Fong, E. (eds.): Canada's Changing Population. Montreal: McGill-Queens University Press: Chapter 11, forthcoming.

Coale, A.J. (1972): Alternative Paths to Stationary Population. In: Westoff, C.F./ Parke, R. (eds.): Demographic and Social Aspects of Population Growth. Volume 1 of Commission Research Reports, U.S. Commission on Population Growth and the American Future. Washington, D.C.: Government Printing Office, 589-604.

del Rey, A./ Ortega, J.A.: The Impact of Migration on Birth Replacement: The Spanish Case. Unpublished manuscript (nd-no date given).

Edmonston, B. (2006): Population Dynamics in Germany: The Role of Immigration and Population Momentum. Population Research and Policy Review, 25:513-545.

Edmonston, B. (2009): The Effect of Immigration on Canadian Provincial Population Growth. In: Canadian Studies in Population, forthcoming.

Edmonston, B./ Lee, S.M./ Passel, J.S. (2001): Intermariage, immigration, et statistiques raciales aux Etats-Unis. In: Critique Internationale 12, 30-38.

Edmonston, B./ Lee, S.M., Passel, J.S. (2002): How Recent Trends in Intermarriage and Immigration Affect the Future Racial Composition of the U.S. Population. In: Perlmann, J./ Waters, M. (eds.): The New Race Question: How the Census Counts Multiracial Individuals. New York: Russell Sage Foundation.

Edmonston, B./ Michalowski, M. (2004): International Migration. In: Shryock, H./ Siegel, J./Swanson, D. (eds.): The Methods and Materials of Demography, Second Edition. New York: Academic Press.

Edmonston, B./ Passel, J.S. (1992): Immigration and Immigrant Generations in Population Projections. In: International Journal of Forecasting 8, 459-476.

Edmonston, B./ Passel, J.S. (1994a): Immigration and Race: Recent Trends in Immigration to the United States. In: Edmonston, B./ Passel, J.S. (eds): Immigration and Ethnicity: the Integration of America's Newest Arrivals. Washington, D.C.: The Urban Institute Press, Chapter 3.

Edmonston, B./ Passel, J.S. (1994b): The Future Immigrant Population of the United States. In: Edmonston, B./ Passel, J.S. (eds.): Immigration and Ethnicity: the Integration of America's Newest Arrivals. Washington, D.C.: The Urban Institute Press, Chapter 11.

Espenshade, T.J./ Bouvier, L.B./ Arthur, W.B. (1982): Immigration and the Stable Population Model. In: Demography 19(1), 125-133.

George, M.V./ Nault, F./ Romaniuc, A. (1991): Effects of Fertility and International Migration on Changing Age Composition in Canada. In: Statistical Journal of the United Nations Economic Commission for Europe 8(1), 13-24.

Gibson, C. (1975): The Contribution of Immigration to U.S. Population Growth: 1790-1970. In: International Migration Review 9(2), 157-177.

Gibson, C. (1992): The Contribution of Immigration to the Growth and Ethnic Diversity of the American Population. In: Proceedings of the American Philosophical Society 136(2), 157-175.

Henripin, J. (1972): Trends and Factors of Fertility in Canada. 1961 Census Monograph. Ottawa: Statistics Canada.

Henripin, J./ Pelletier, L. (1986): Un quart d'allogènes au Québec dans 100 ans? In: Cahiers Québécois de Démographie 15 (2), 227-251.

Hyrenius, H. (1951): Reproduction and Replacement. In: Population Studies 4, 421-431.

Hyrenius, H. (1959): Population Growth and Replacement. In: Hauser, P-M./ Duncan, O.D. (eds.): The Study of Population. Chicago: University of Chicago Press, 472-485.

Keyfitz, N. (1950): The Growth of Canadian Population. In: Population Studies 4, 47-63.

Keyfitz, N. (1969): Age Distribution and the Stable Equivalent. In: Demography 6, 261-269.

Keyfitz, N. (1970): On the Momentum of Population Growth. In: Demography 8, 71-80.

Keyfitz, N. (1971): Migration as a Means of Population Control. In: Population Studies 25(19), 63-72.

Lachapelle, R. (1990): Le concept de population stable ouverte: application a l'étude des variations de la structure démographique. In: Cahiers Québécois de Démographie 19(2), 197-214.

Lee, S.M. (2009): Ethnic Origins of the Canadian Population. In: Edmonston, B./ Fong, E. (eds.): Canada's Changing Population. Montreal: McGill-Queens University Press, Chapter 12.

Lee, S.M./ Boyd, M. (2008): Marrying Out: Comparing the Marital and Social Integration of Asians in the U.S. and Canada. In: Social Science Research 37, 311-327.

Lee, S.M./ Edmonston, B. (2006): Hispanic Intermarriage, Identification, and U.S. Latino Population Change. In: Social Science Quarterly, Special Issue on "Ethnicity and Social Change" 27(5), 1263-1279.

Luther, N.Y./ Gaminiratine, K.H.W./ de Silva, S./ Retherford, R.D. (1987): Consistent Correction of International Data for Sri Lanka, 1971-1981. In: International Migration Review, Special Issue: Measuring International Migration: Theory and Practice 21(4), 335-369.

McDougall, D.M. (1961): Immigration into Canada, 1851-1920. In: Canadian Journal of Economics and Political Science 27(2), 162-175.

McInnis, M. (1994): Immigration and Emigration: Canada in the Late Nineteenth Century. In: Hatton, T.J./ Williamson, J.G. (eds.): Migration and the International Labor Market 1850-1939. London and New York: Routledge, 139-155.

Ortega, J.A. (2006): Birth Replacement Ratio: New Measures of Period Population Replacement. Documento de Trabajo No. 261/2006. Fundación de la Cajas Ahorros.

Preston. S.H./ Heuveline, P./Guillot, M. (2001): Demography – Measuring and Modelling Population Process. Blackwell Publishers. Malden MA.

Ram, B./ George, M.V. (1993): Convergence of Immigrant and Native-Born Fertility in Canada. Paper presented at the 22nd General Conference of the International Union for the Scientific Study of Population, Montreal, 24 August-1 September.

Ryder, N.B. (1997): Migration and Population Replacement. In: Canadian Studies in Population 24(1), 1-26.

Simmons, A. (1995): Consequences of International Migration: The Canadian Experience. In: Voets, S./ Schoorl, J./ de Bruijn, B. (eds.): The Demographic Consequences of International Migration. Report No. 44. The Hague, Netherlands: Netherlands Interdisciplinary Demographic Institute, 395-416.

Simmons, A. (2009): The Population of Canada. In: Edmonston, B./ Fong, E. (eds.): Canada's Changing Population. Montreal: McGill-Queens University Press, Chapter 1.

Smith, J.P./ Edmonston, B. (1997): The New Americans: Economic, Fiscal, and Demographic Effects of Immigration. Washington, D.C.: National Academy Press.

Statistics Canada (1965): Historical Statistics of Canada. Ottawa: Statistics Canada.

Statistics Canada (1993): Canada Year Book 1994. Ottawa: Minister of Industry, Science, and Technology.

Statistics Canada (2006): Annual Demographic Statistics: 2005. Catalogue no. 91-213-XPB. Ottawa: Ministry of Industry.

Tribalat, M. (1991): Cent ans d'immigration, étrangers d'hier, Français d'aujourd'hui. Apport démographique, dynamique familiale et économique de l'immigration étrangère. Paris, Presses universitaires de France, Institut national d'études démographiques.

Tribalat, M. (1992): How Many People in France are of Foreign Descent? In: Population: An English Selection 4, 55-73.

Vincent, P. (1946): De la mesure du taux intrinsèque d'accroissement naturel dans les populations monogames. In: Population 1, 699-712.

Appendix A.

Estimation of Census Population Size

Two adjustments are made to the census population figures to derive an estimated total population of Canada for the period prior to 1951. Table A-1 displays the official census population figures for Canada, along with adjustments for the population of Newfoundland and for undercount of native peoples.

First, an estimate for the population of Newfoundland is added to the census counts for Canada for the 1851 to 1941 period, prior to Newfoundland joining Canada in 1949. This adjustment is made so that there is a consistent population over the entire 1851 to 2006 period for the population reconstruction. The population of Newfoundland is small relative to the Canadian total (about 2 to 4 per cent of the total during 1851 to 1941). Any errors in the estimates for Newfoundland's population would have a comparatively minor impact on international migration estimates for the Canadian population.

Table A-1:   Population of Canada, 1851-1951, for the territory of Canada in 1951

Year	Census Population	Estimated Newfoundland Population	Estimated Undercount of Native Peoples	Estimated Total Population
1851	2,436,297	109,000	100,000	2,645,000
1861	3,229,633	123,000	100,000	3,453,000
1871	3,689,257	138,000		3,827,000
1881	4,324,810	156,000		4,481,000
1891	4,833,239	176,000		5,009,000
1901	5,371,315	198,000		5,569,000
1911	7,206,643	223,000		7,430,000
1921	8,787,949	252,000		9,040,000
1931	10,376,786	284,000		10,662,000
1941	11,506,655	320,000		11,827,000
1951[13]	14,009,429	361,416		14,009,429

13   The 1951 census of Canada includes Newfoundland.

Second, Dominion Bureau of Statistics research for the 1931 census of Canada (cited by Keyfitz, 1950: 47) suggested that there may have been an undercount of about 100,000 native peoples in the 1851 and 1861 censuses. We allow for this undercount and add an additional 100,000 to the census counts for 1851 and 1861.

If these two adjustments were not made to census counts, the Canadian population would appear to be about 8 per cent smaller in 1851 and about 2 per cent smaller in 1941. The effect of not making these adjustments would have been to reduce modestly the apparent emigration numbers for the population reconstruction.

Appendix B.

Comparison of International Migration Estimates

In additional to estimates of international migration prepared by Statistics Canada (1965, 1993, and 2006), various researchers have made estimates of immigration and emigration under different assumptions. Available estimates are presented in Table B.1.

Keyfitz (1950) prepared the first consistent set of migration estimates for Canada. His work offers a careful review of available life tables and alternative mortality assumptions, surviving census populations by age and sex forward ten years, and estimating net migration. Taking immigration estimates from official records, he derived emigration as a residual. His work is also useful for its analysis of the Canadian-born population in U.S. censuses, and its consistency with Canadian emigration estimates. His work, conducted while at the Dominion Bureau of Statistics, was a forerunner of later estimates prepared by Statistics Canada. Statistics Canada (1965) has revised and updated the pioneering estimates of Keyfitz. These data are reproduced by many users as the "official" historical immigration estimates.

There is a serious problem of international transients to Canada being counted as immigrants in the immigration statistics for the late nineteenth century. Warnings about the overstatement of immigration numbers for the 1870 to 1900 period have been sounded by McDougall (1961) and McInnis (1994), as well as the Historical Statistics of Canada (Statistics Canada, 1965: 11), where Kenneth Buckley notes that the immigration statistics are "grossly exaggerated from 1873 to 1891".

McDougall's (1961) work incorporated two important revisions. First, he argued that life tables derived from the U.S. mortality experience are preferable for the study of Canadian mortality, rather than the English life tables used by Keyfitz. Second, he presented alternative immigration statistics, derived from information on emigration from Europe and the United States. A major limitation to official Canadian immigration data for the late nineteenth century is that the data do not distinguish between long-term immigrants and international transients. A substantial proportion of "immigrants" into Canada during the 1851 to 1901 period are persons who resided in Canada for only a short period before moving to the United States. Canadian immigration data for the late nineteenth century might more aptly be called arrival data.

McInnis's research addresses problems in the immigration and emigration data of the late nineteenth century and provides new estimates. To emphasize the problems with "official" Canadian immigration data, McInnis (1994: 141) writes:

"In the decade 1871-80, the Canadian emigration rate of 109.3 (per 1,000 population; implied by official immigration numbers) is almost double that shown for Ireland, the European country with the highest rate. In the following decade the Canadian rate soared to 243.1 – far higher than experienced by any European country. If we are to believe the conventionally used figures the emigration from Canada in that decade [the 1880s] would have been equal to one-quarter of the whole population, at a time when about half of the population was under fifteen years of age. That is little short of astonishing and compels one seriously to question the validity of the data."

McInnis's reassessment of immigration statistics includes a careful analysis of published records of Canadian immigration agents. He points out that counts of immigrant arrivals include several sources of misstatement: (a) along with transient passengers (arrivals in Canada who were destined for the United States), there were also persons ticketed for a Canadian destination who then travelled on to a final destination in the United States; (b) the reported immigration numbers for western inland ports probably miss many immigrants from the United States but also mistakenly include Canadians from Ontario who travelled west by a U.S. route; (c) arrivals at the Niagara suspension bridge include many Canadians living in the United States who were making a visit home; and (d) arrivals at Pacific ports were reported after 1880 but include many arrivals who were probably not immigrants. After considering available information, McInnis suggests that it may be preferable to use available Canadian data on intercontinental arrivals for immigration analysis. Data on intercontinental arrivals count only arrivals at ocean ports (consisting of all European and Asian immigrants to Canada); such data do not count immigrants from the United States, but would include arrivals that were using Canada as a route to the United States. Even so, McInnis's opinion (1984: 148) is that data on intercontinental arrivals is probably an overstatement of Canadian immigration. We use McInnis's revised figures on immigration for 1871 to 1901 for this paper, although my estimates for immigration for 1891 to 1901 are slightly higher.

Table B-1: Estimates of international migration (in 1,000s), Canada, 1851-2006

Decade	Canada	Keyfitz	McDougall	McInnis	Edmonston
Immigration					
1851-1861	352	209	486	X[14]	231
1861-1871	260	189	266	X	175
1871-1881	350	353	253	154	155
1881-1891	680	903	448	296	296
1891-1901	250	326	249	292	339
1901-1911	1,550	1,782	1,111	X	1,544
1911-1921	1,400	1,592	1,373	X	1,412
1921-1931	1,200	1,198	X	X	1,230
1931-1941	149	149	X	X	157
1941-1951	548	X	X	X	491
1951-1961	1,543	X	X	X	1,578
1961-1971	1,429	X	X	X	1,410
1971-1981	1,429	X	X	X	1,441
1981-1991	1,374	X	X	X	1,332
1991-2001	2,234	X	X	X	2,234
2001-2006	937	X	X	X	937
Emigration					
1851-1861	170	86	332	X	86
1861-1871	411	376	436	X	377
1871-1881	404	438	293	361	361
1881-1891	826	1,108	602	695	695
1891-1901	380	507	364	500	500
1901-1911	739	1,066	317	X	680
1911-1921	1,089	1,360	1,067	X	1,000
1921-1931	971	1,095	X	X	860
1931-1941	241	262	X	X	262
1941-1951	379	X	X	X	234
1951-1961	462	X	X	X	462
1961-1971	707	X	X	X	424
1971-1981	566	X	X	X	432
1981-1991	582	X	X	X	495
1991-2001	488	X	X	X	488
2001-2006	194	X	X	X	194

---

14 No estimates for this figure were made.

Table B-1:   Continued

Decade	Canada	Keyfitz	McDougall	McInnis	Edmonston
			Net Immigration		
1851-1861	182	123	154	X	145
1861-1871	-151	-190	-170	X	-202
1871-1881	-54	-85	-40	-207	-206
1881-1891	-146	-205	-154	-399	-399
1891-1901	-130	-181	-115	-208	-161
1901-1911	811	716	794	X	864
1911-1921	311	232	306	X	412
1921-1931	229	103	X	X	370
1931-1941	-92	-113	X	X	-105
1941-1951	169	X	X	X	257
1951-1961	1,081	X	X	X	1,116
1961-1971	722	X	X	X	986
1971-1981	863	X	X	X	1,009
1981-1991	792	X	X	X	837
1991-2001	1,746	X	X	X	1,746
2001-2006	743	X	X	X	743

Sources: Statistics Canada (1965, 1993, 2006); Keyfitz (1950: Table 11);
McDougall (1961: Table 3); McInnis (1994: Table 7.1.).

Appendix C.

Estimating the Ccontirbution of Immigration to Population Growth

Tables C.1 through C.4 show estimates of immigration's contribution to population size and growth by decade.

Table C-1:   Contribution of post-1851 immigration and the 1851 population to Canada's population size (populations in 1,000s), 1851-2006

Contribution from Component	2006	2001	1991	1981	1971	1961	1951	1941
Population Size	31,613	29,639	26,994	24,343	21,568	18,238	14,009	11,827
Estimated Population Contribution From:								
1851 Population	9,558	9,326	9,054	8,729	8,313	7,591	6,501	5,636
1st Generation	0	0	0	0	0	0	0	0
2nd Generation	0	0	0	0	2	6	25	76
3rd Generation	0	1	14	48	126	261	429	597
4th+ Generations	9,558	9,325	9,040	8,681	8,185	7,323	6,047	5,636
Immigration since 1851	22,055	20,313	17,940	15,614	13,255	10,647	7,508	6,191
Immigration During								
1851-1861	1,454	1,429	1,413	1,322	1,231	1,086	879	767
1861-1871	697	694	696	660	608	531	446	386
1871-1881	413	407	404	379	343	310	264	223
1881-1891	211	208	206	193	184	177	155	140
1891-1901	364	368	374	360	342	306	267	232
1901-1911	3,405	3,338	3,293	3,073	2,834	2,640	2,232	1,891
1911-1921	2,665	2,595	2,542	2,356	2,269	2,087	1,689	1,510
1921-1931	1,461	1,513	1,577	1,555	1,482	1,314	1,146	1,013
1931-1941	72	70	69	64	56	51	40	29
1941-1951	736	712	693	638	606	528	392	
1951-1961	2,238	2,240	2,255	2,148	1,988	1,619		
1961-1971	1,732	1,682	1,644	1,520	1,309			
1971-1981	1,723	1,614	1,554	1,346				
1981-1991	1,506	1,334	1,220					
1991-2001	2,442	2,108						
2001-2006	936							

Table C-1:   Continued

Contribution from Component	1931	1921	1911	1901	1891	1881	1871	1861	1851
Population Size	10,661	9,040	7,430	5,569	5,009	4,481	3,827	3,453	2,645
Estimated Population Contribution From:									
1851 Population	5,063	4,847	4,820	4,479	4,181	3,841	3,392	3,216	2,645
1st Generation	2	7	30	85	172	265	366	504	607
2nd Generation	167	298	465	637	800	933	999	1035	788
3rd Generation	734	902	1,109	1,195	1,140	904	564	315	142
4th+ Generations	4,161	3,639	3,247	2,561	2,069	1,739	1,461	1,362	1,107
Immigration since 1851	5,598	4,193	2,610	1,090	828	640	435	237	(X)
Immigration During									
1851-1861	684	584	526	465	390	332	293	237	
1861-1871	333	308	291	240	217	189	142		
1871-1881	207	207	186	164	154	119			
1881-1891	132	113	99	87	67				
1891-1901	202	185	166	134					
1901-1911	1,774	1,619	1,342						
1911-1921	1,406	1,177							
1921-1931	860								
1931-1941									
1941-1951									
1951-1961									
1961-1971									
1971-1981									
1981-1991									
1991-2001									
2001-2006									

Table C-2: Percentage contribution of post-1851 immigration and the 1851 population to Canada's population size (populations in 1,000s), 1851-2006

Contribution from Component	2006	2001	1991	1981	1971	1961	1951	1941
Population Size	31,613	29,639	26,994	24,343	21,568	18,238	14,009	11,827
Per cent Estimated Contribution to Population Size From:								
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1851 Population	30.2	31.5	33.5	35.9	38.5	41.6	46.4	47.7
1st Generation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2nd Generation	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6
3rd Generation	0.0	0.0	0.1	0.2	0.6	1.4	3.1	5.0
4th+ Generations	30.2	31.5	33.5	35.7	37.9	40.2	43.2	47.7
Immigration since 1851	69.8	68.5	66.5	64.1	61.5	58.4	53.6	52.3
Immigration During								
1851-1861	4.6	4.8	5.2	5.4	5.7	6.0	6.3	6.5
1861-1871	2.2	2.3	2.6	2.7	2.8	2.9	3.2	3.3
1871-1881	1.3	1.4	1.5	1.6	1.6	1.7	1.9	1.9
1881-1891	0.7	0.7	0.8	0.8	0.9	1.0	1.1	1.2
1891-1901	1.1	1.2	1.4	1.5	1.6	1.7	1.9	2.0
1901-1911	10.8	11.3	12.2	12.6	13.1	14.5	15.9	16.0
1911-1921	8.4	8.8	9.4	9.7	10.5	11.4	12.1	12.8
1921-1931	4.6	5.1	5.8	6.4	6.9	7.2	8.2	8.6
1931-1941	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2
1941-1951	2.3	2.4	2.6	2.6	2.8	2.9	2.8	
1951-1961	7.1	7.6	8.4	8.8	9.2	8.9		
1961-1971	5.5	5.7	6.1	6.2	6.1			
1971-1981	5.5	5.4	5.8	5.5				
1981-1991	4.8	4.5	4.5					
1991-2001	7.7	7.1						
2001-2006	3.0							

Table C-2:   Continued

Contribution from Component	1931	1921	1911	1901	1891	1881	1871	1861	1851
Population Size	10,661	9,040	7,430	5,569	5,009	4,481	3,827	3,453	2,645
Per cent Estimated Contribution to Population Size From:									
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1851 Population	47.5	53.6	64.9	80.4	83.5	85.7	88.6	93.1	100.0
1st Generation	0.0	0.1	0.4	1.5	3.4	5.9	9.6	14.6	23.0
2nd Generation	1.6	3.3	6.3	11.4	16.0	20.8	26.1	30.0	29.8
3rd Generation	6.9	10.0	14.9	21.5	22.8	20.2	14.7	9.1	5.4
4th+ Generations	39.0	40.3	43.7	46.0	41.3	38.8	38.2	39.4	41.9
Immigration since 1851	52.5	46.4	35.1	19.6	16.5	14.3	11.4	6.9	(X)
Immigration During									
1851-1861	6.4	6.5	7.1	8.4	7.8	7.4	7.7	6.9	
1861-1871	3.1	3.4	3.9	4.3	4.3	4.2	3.7		
1871-1881	1.9	2.3	2.5	3.0	3.1	2.6			
1881-1891	1.2	1.3	1.3	1.6	1.3				
1891-1901	1.9	2.0	2.2	2.4					
1901-1911	16.6	17.9	18.1						
1911-1921	13.2	13.0							
1921-1931	8.1								
1931-1941									
1941-1951									
1951-1961									
1961-1971									
1971-1981									
1981-1991									
1991-2001									
2001-2006									

Table C-3: Percentage contribution of post-1851 immigration and the 1851 population to Canada's population growth since 1851 (populations in 1,000s), 1851-2006

Contribution from Component	2006	2001	1991	1981	1971	1961	1951	1941
Population Growth Since 1851	28,968	26,994	23,658	20,978	18,504	15,275	11,351	9,170
Per cent Estimated Contribution to Population Growth Since 1851 From:								
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1851 Population	23.9	24.7	26.1	27.7	29.7	31.5	33.8	32.5
1st Generation	-2.1	-2.2	-2.6	-2.9	-3.3	-4.0	-5.4	-6.7
2nd Generation	-2.7	-2.9	-3.4	-3.8	-4.3	-5.2	-6.8	-7.8
3rd Generation	-0.5	-0.5	-0.5	-0.5	-0.1	0.7	2.5	5.0
4th+ Generation	29.2	30.4	32.5	34.9	37.4	39.9	43.5	49.3
Immigration since 1851	76.1	75.3	73.9	72.3	70.3	68.5	66.2	67.5
Immigration During								
1851-1861	5.0	5.3	5.8	6.3	6.5	7.0	7.7	8.4
1861-1871	2.4	2.6	2.9	3.1	3.2	3.4	3.9	4.2
1871-1881	1.4	1.5	1.7	1.8	1.8	2.0	2.3	2.4
1881-1891	0.7	0.8	0.9	0.9	1.0	1.1	1.4	1.5
1891-1901	1.3	1.4	1.5	1.7	1.8	2.0	2.4	2.5
1901-1911	11.8	12.4	13.6	14.2	15.0	17.0	19.7	20.6
1911-1921	9.2	9.6	10.5	10.9	12.0	13.4	14.9	16.5
1921-1931	5.0	5.6	6.5	7.2	7.9	8.5	10.1	11.0
1931-1941	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.3
1941-1951	2.5	2.6	2.9	3.0	3.2	3.4	3.5	
1951-1961	7.7	8.3	9.3	9.9	10.5	10.4		
1961-1971	6.0	6.2	6.8	7.0	6.9			
1971-1981	5.9	6.0	6.4	6.2				
1981-1991	5.2	4.9	5.0					
1991-2001	8.4	7.8						
2001-2006	3.2							

Table C-3:   Continued

Contribution from Component	1931	1921	1911	1901	1891	1881	1871	1861	1851
Population Growth Since 1851	8,010	6,364	4,798	2,931	2,311	1,981	1,352	718	(X)
Per cent Estimated Contribution to Population Growth Since 1851 From:									
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	(X)
1851 Population	30.0	34.2	45.4	62.6	64.4	66.5	66.3	67.7	(X)
1st Generation	-7.6	-9.5	-12.1	-17.9	-19	-17.0	-16.8	-16.4	(X)
2nd Generation	-7.8	-7.8	-6.8	-5.2	0.0	8.8	18.9	30.6	(X)
3rd Generation	7.4	11.9	20.2	36.1	42.8	40.0	33.1	23.0	(X)
4th+ Genera-tion	38.1	39.6	44.7	49.7	40.7	34.7	30.9	30.5	(X)
Immigration since 1851	70.0	65.8	54.6	37.4	35.6	33.5	33.7	32.3	(X)
Immigration During									
1851-1861	8.6	9.2	11.0	15.9	16.7	17.4	22.7	32.3	
1861-1871	4.2	4.8	6.1	8.2	9.3	9.9	11.0		
1871-1881	2.6	3.3	3.9	5.6	6.6	6.2			
1881-1891	1.6	1.8	2.1	3.0	2.9				
1891-1901	2.5	2.9	3.5	4.6					
1901-1911	22.2	25.4	28.1						
1911-1921	17.6	18.5							
1921-1931	10.7								
1931-1941									
1941-1951									
1951-1961									
1961-1971									
1971-1981									
1981-1991									
1991-2001									
2001-2006									

Table C-4: Contribution of post-1851 immigration and the 1851 population for Canada's population size (populations in 1,000s), 1851-2006

Contribution from Component	2006	2001	1991	1981	1971	1961	1951	1941
Population Size	31,613	29,639	26,994	24,343	21,568	18,238	14,009	11,827
Estimated Population Size From Contribution of 1851 Population:								
1851 Population	9,558	9,326	9,054	8,729	8,313	7,591	6,501	5,636
1st Generation	0	0	0	0	0	0	0	0
2nd Generation	0	0	0	0	2	6	25	76
3rd Generation	0	1	14	48	126	261	429	597
4th+ Generations	9,558	9,325	9,040	8,681	8,185	7,323	6,047	5,636
Estimated Population Size If Immigration Had Been Cut:								
Immigration Cut After								
1851	9,558	9,326	9,054	8,729	8,313	7,591	6,501	5,636
1861	11,012	10,755	10,467	10,051	9,544	8,677	7,379	6,403
1871	11,709	11,449	11,164	10,711	10,153	9,207	7,825	6,789
1881	12,122	11,857	11,567	11,090	10,496	9,518	8,089	7,012
1891	12,334	12,065	11,773	11,282	10,681	9,695	8,244	7,152
1901	12,697	12,432	12,147	11,643	11,023	10,001	8,511	7,384
1911	16,103	15,771	15,440	14,716	13,857	12,640	10,743	9,275
1921	18,768	18,365	17,983	17,072	16,126	14,727	12,431	10,785
1931	20,228	19,878	19,560	18,627	17,608	16,041	13,577	11,798
1941	20,301	19,949	19,629	18,691	17,664	16,091	13,617	11,827
1951	21,037	20,661	20,322	19,329	18,270	16,619	14,009	
1961	23,275	22,901	22,577	21,477	20,259	18,238		
1971	25,007	24,583	24,221	22,997	21,568			
1981	26,730	26,196	25,774	24,343				
1991	28,236	27,531	26,994					
2001	30,678	29,639						
2006	31,613							

Table C-4:   Continued

Contribution from Component	1931	1921	1911	1901	1891	1881	1871	1861	1851
Population Size	10,661	9,040	7,430	5,569	5,009	4,481	3,827	3,453	2,645
Estimated Population Size From Contribution of 1851 Population:									
1851 Population	5,063	4,847	4,820	4,479	4,181	3,841	3,392	3,216	2,645
1st Generation	2	7	30	85	172	265	366	504	607
2nd Generation	167	298	465	637	800	933	999	1,035	788
3rd Generation	734	902	1,109	1,195	1,140	904	564	315	142
4th+ Generations	4,161	3,639	3,247	2,561	2,069	1,739	1,461	1,362	1,107
Estimated Population Size If Immigration Had Been Cut:									
Immigration Cut After									
1851	5,063	4,847	4,820	4,479	4,181	3,841	3,392	3,216	2,645[15]
1861	5,748	5,431	5,346	4,944	4,571	4,173	3,685	3,453	
1871	6,080	5,739	5,637	5,184	4,787	4,362	3,827		
1881	6,287	5,946	5,823	5,348	4,942	4,481			
1891	6,419	6,059	5,922	5,435	5,009				
1901	6,621	6,244	6,088	5,569					
1911	8,395	7,863	7,430						
1921	9,801	9,040							
1931	10,661								
1941									
1951									
1961									
1971									
1981									
1991									
2001									
2006									

---

15   The diagonal figures represent the actual population, with no cut for immigration.

A General Framework for Estimating Population Movements

James Raymer

1. Introduction

Currently, migration is a major driver of national and sub-national population change. The comparative study of migration, however, is hindered by data availability, quality and consistency. Furthermore, harmonisation of data collection processes and the data they generate is not close to being realised (Bell et al., 2002; Poulain et al., 2006). Therefore, our understanding of population change and the drivers of migration are limited, as is the evidence base for policies concerning migration or population change.

To overcome the many problems of migration data, models are needed (i) to correct for the inadequacies and inconsistencies in the available data and (ii) to estimate the missing patterns. In this chapter, a framework based on a categorical data analysis approach is used to illustrate the estimation of origin-destination movements of particular groups, and how they evolve over time. There are two situations of interest. The first is internal movements within a country, where the data may come from censuses, surveys or population registers. The second is international movements where the data come from the sending country, the receiving country, or both. The case of international migration is more complicated because of the inconsistencies in migrant definitions and data collection methods between countries, that is, each country collects its own data for its own purposes with little communication and coordination taking place between countries.

The combination of multiple data sources increases the capacity to study migration and population change by producing both harmonised data sets and patterns over time. With the methodology presented in this chapter, national and local governments can improve their planning policies directed at supplying particular social services or at influencing the levels of migration of particular groups. This work is important because migration is currently, and increasingly, the major factor contributing to population change throughout the world. However, because we do not have detailed and updated information about migrants over time, our understanding of how or why populations change, is (usually) limited to the most recent census, which only captures the detailed migration patterns for a one-year period,

not including emigrants who moved to another country. Furthermore, this information is often out-dated. For example, at the time of writing, England's most recent census occurred over eight years ago. (Of course, countries with highly developed population registers, such as those in the Nordic countries, are in a much better situation.) The methodology set out in this paper offers a pragmatic solution, one that makes the best use of available data.

2. General Modelling Framework

We are interested in estimating migration flow tables with multiple dimensions. The basic dimensions are origin (O), destination (D), age (A) and sex (S). Migration flow tables are composed of various hierarchical structures, not all of which are necessary for accurate prediction. If certain (important) structures are unavailable, they can be imputed or 'borrowed' from auxiliary data sources. This general modelling framework comes from a sequence of recent papers on the age and spatial structures of interregional migration, and how they can be represented by a multiplicative modelling framework (Raymer et al., 2006; Raymer/Rogers, 2007; Rogers et al., 2002a; Rogers et al., 2001, 2002b, 2003).

Consider migration from origin i to destination j, denoted by n_{ij}. These counts can be organised in a two-way table, such as in Table 1 for migration between four hypothetical regions. For analyses of these tables, it is important to make a distinction between cell counts (n_{ij}) and marginal totals, that is the total number of out-migrants from each region (n_{i+}), the total number of in-migrants to each region (n_{+j}) and the overall level of migration (n_{++}). Furthermore, for analysis or description of patterns over time, it is useful to consider a multiplicative decomposition of the cell counts. A multiplicative component model for an origin by destination table is defined as:

$$n_{ij} = (T)(O_i)(D_j)(OD_{ij}),\tag{1}$$

where T is the total number of migrants (i.e., n_{++}), O_i is the proportion of all migrants leaving from place i (i.e., n_{i+}/n_{++}), and D_j is the proportion of all migrants moving to place j (i.e., n_{+j}/n_{++}). The interaction component OD_{ij} is defined as $n_{ij}/((T)(O_i)(D_j))$ or the ratio of observed migration to expected migration (for the case of no interaction). This general type of model is called a *multiplicative component model* (see also Raymer et al., 2006; Raymer/Rogers, 2007).

Notation for an origin-by-destination migration flow table

Region	Region of Destination				
of Origin	1	2	3	4	Total
1	0	n_{12}	n_{13}	n_{14}	n_{1+}
2	n_{21}	0	n_{23}	n_{24}	n_{2+}
3	n_{31}	n_{32}	0	n_{34}	n_{3+}
4	n_{41}	n_{42}	n_{43}	0	n_{4+}
Total	n_{+1}	n_{+2}	n_{+3}	n_{+4}	n_{++}

For illustration of the multiplicative components and their interpretation, the 1990-1991 and 2000-2001 migration flows between four regions in England have been set out in Table 2. Consider the migration from the South to London (n_{34}) for both periods. In the first period, there were 43 thousand persons who made this move. In the second period, there were 67 thousand. What caused this increase? Was it because the overall level of interregional migration increased from 495 thousand to 712 thousand? Was it because more migrants were leaving the South or more migrants going to London? Or was it because the interaction (or connectivity) between the South and London increased? The calculation of multiplicative components can help us answer these questions.

Table 2:   Interregional migration in England, 2000-2001

	Destination				
Origin	North	Centre	South	London	Total
A. 1990-1991					
North	0	44,503	33,487	15,487	93,477
Centre	41,401	0	61,696	29,923	133,020
South	31,012	56,165	0	43,055	130,232
London	16,479	49,644	72,357	0	138,480
Total	88,892	150,312	167,540	88,465	495,209
A. 2000-2001					
North	0	62,765	40,410	25,457	128,632
Centre	64,707	0	84,849	49,005	198,561
South	41,093	83,854	0	66,891	191,838
London	21,315	74,005	97,680	0	193,000
Total	127,115	220,624	222,939	141,353	712,031

Note: North = North East, North West and Yorkshire and the Humber; Centre = East Midlands, West Midlands and East of England; South = South East and South West.

In Table 3, the multiplicative components for the flows set out in Table 2 are presented. For the 1990-1991 and 2000-2001 South to London flows, the multiplicative components are equal to:

$$n_{34}^{1990-1} = (T)(O_3)(D_4)(OD_{34}) = (495,209)(0.263)(0.179)(1.851) \text{ and}$$

$$n_{34}^{2000-1} = (T)(O_3)(D_4)(OD_{34}) = (712,031)(0.269)(0.199)(1.756),$$

where 3 = South and 4 = London. From these calculations, it is clear that most of the increase was attributed to the overall level increase. The proportion of out-migration from the South remained, more or less, the same. The proportion of in-migration to London increased but this was offset by the decrease in the connectivity between the South and London.

Table 3:   Multiplicative components of interregional migration in England, 1990-1991 and 2000-2001

Period	T	Region	O_i	D_j	OD_{i1}	OD_{i2}	OD_{i3}	OD_{i4}
1990-1	495,209	North (1)	0.189	0.180	0.000	1.568	1.059	0.927
		Centre (2)	0.269	0.304	1.734	0.000	1.371	1.259
		South (3)	0.263	0.338	1.327	1.421	0.000	1.851
		London (4)	0.280	0.179	0.663	1.181	1.544	0.000
2000-1	712,031	North (1)	0.181	0.179	0.000	1.575	1.003	0.997
		Centre (2)	0.279	0.310	1.825	0.000	1.365	1.243
		South (3)	0.269	0.313	1.200	1.411	0.000	1.756
		London (4)	0.271	0.199	0.619	1.238	1.616	0.000

Note: North = North East, North West and Yorkshire and the Humber; Centre = East Midlands, West Midlands and East of England; South = South East and South West.

Next, consider the representation of age-specific migration patterns between these regions. The multiplicative component model for this table is specified as:

$$n_{ijx} = (T)(O_i)(D_j)(A_x)(OD_{ij})(OA_{ix})(DA_{jx})(ODA_{ijx}), \qquad (2)$$

where A_x is the proportion of all migrants in age group x. This model is more complicated because there are now three two-way interaction components and a

76

single three-way interaction component between the origin, destination, and age variables. However, the interpretations of the parameters remain relatively simple and the calculations follow the same format as presented for the two-way table. That is, the interaction components represent ratios of observed flows or marginal totals to expected ones. For example, the destination-age interaction (DA_{jx}) component is calculated as $n_{+jx} / ((T)(D_j)(A_x))$ and represents the ratios of observed age patterns of in-migration to each region divided by the expected age pattern of in-migration.

The multiplicative component model set out in Equation 2 for describing and analysing tables of migration flows can be expressed as a *saturated* log-linear (statistical) model:

$$\ln(n_{ijx}) = \lambda + \lambda_i^O + \lambda_j^D + \lambda_x^A + \lambda_{ij}^{OD} + \lambda_{ix}^{OA} + \lambda_{jx}^{DA} + \lambda_{ijx}^{ODA}, \qquad (3)$$

where the λ s are simply the natural logarithms of the variables appearing in Equation 2. The saturated model is expressed as (ODA), using the notation set out in Agresti (2002: 320). The parameters of the log-linear model can be analyzed using standard statistical techniques for categorical data analysis to identify key structures in the data. For introductory texts on categorical data analysis and log-linear models, refer to Agresti (2007) or Fienberg (1980). For examples of log-linear models applied to age-specific patterns of migration, see Raymer and Rogers (2007), van Wissen et al. (2008) and Willekens (1994).

Reduced forms of the model set out in Equation 3 are called *unsaturated* models. For example, the model that only includes the *main effects* of origin, destination, and age is specified as

$$\ln\left(\hat{n}_{ijx}\right) = \lambda + \lambda_i^O + \lambda_j^D + \lambda_x^A . \qquad (4)$$

This model assumes independence between each of the categories of origin, destination, and age and is designated (O, D, A). A model that includes the interaction between origin and destination plus all of the main effects is designated as (OD, A) and is denoted as:

$$\ln\left(\hat{n}_{ijx}\right) = \lambda + \lambda_i^O + \lambda_j^D + \lambda_x^A + \lambda_{ij}^{OD} . \qquad (5)$$

Such notations are used because these models are hierarchical, that is, for two-way interaction terms, the main effect parameters must be included, and for three-way interaction terms all the main effects and two-way interactions must be included. Note, throughout this paper, we use the capital letters set out in Table 4 to describe

various categorical variables and association structures interchangeably. For example, OD may refer to a two-way table of migration flows by origin and destination or an origin-destination association structure. We also exclude the n_{ii} values, i.e., the non-migrants or 'stayers', from the analyses.

Table 4:   Terms used to describe categorical variables

Notation	Variable
O	Origin
D	Destination
A	Age
S	Sex
E	Ethnicity
G	Economic Activity

Migration flow tables are complicated because they can mix migrants with non-migrants or intraregional migrants. To remove non-migrant elements from the analysis, structural zeros can be inserted by using an *offset* containing zeros in the diagonal elements and ones in the off-diagonal elements (Willekens 1983). An offset can also be used to incorporate auxiliary information in the off-diagonal elements of the table to improve the estimation procedure. Auxiliary information can be obtained, for example, from a recent census or survey table of migration flows. For instance, consider the following log-linear-with-offset model:

$$\ln\!\left(\hat{n}_{ijx}\right) = \lambda + \lambda_i^O + \lambda_j^D + \lambda_x^A + \ln\!\left(n_{ijx}^*\right), \tag{6}$$

where the offset is denoted by n_{ijx}^*. In this case the values contained in the offset are forced to fit the marginal totals represented by the overall level and the main effects of origin, destination and age.

The use of offsets in a log-linear model produces the same results as those obtained from iterative proportional fitting (IPF). In both cases, maximum likelihood estimates are produced (Willekens, 1999). In Table 5, IPF is used to estimate the 2000-2001 migration, assuming quasi-independence between origin and destination, that is, structural zeros are placed in the offset to prevent the estimation of non-migrants. In terms of a log-linear-with-offset model, this model is specified as:

$$\ln\!\left(\hat{n}_{ij}\right) = \lambda + \lambda_i^O + \lambda_j^D + \ln\!\left(n_{ij}^*\right), \tag{7}$$

which basically rescales the values in the offset (n_{ij}^{*}) to fit the observed 2000-2001 margins. With IPF, the values in the offset are first forced to fit the row margins of the 2000-2001 data (i.e., Iteration 1 in Table 5), which are then forced to fit the 2000-2001 column margins (i.e., Iteration 2 in Table 5). For example,

$$\hat{n}_{34}^1 = (n_{34}^* / n_{3+}^*)(n_{3+}^0) = (1/3)(191{,}838) = 63{,}946, \ \hat{n}_{34}^2 =$$
$$(\hat{n}_{34}^1 / \hat{n}_{+4}^1)(n_{+4}^0) = (63{,}946/173{,}010) \ (141{,}353) = 52{,}245 \text{ and } \hat{n}_{34}^3$$
$$= (\hat{n}_{34}^2 / \hat{n}_{3+}^2)(n_{3+}^0) = (52{,}245/176{,}472)(191{,}838) = 56{,}794.$$

This process continues until both margins of the estimated flow table match the observed 2000-2001 margins (i.e., Iteration 13 in Table 5).

The simple example presented in Table 5 illustrates the idea behind the log-linear-with-offset model. For comparison, estimates resulting from the inclusion of an offset with migration flows observed during the 1990-1991 period (Table 2A) are presented in Table 6. For this case, it took 15 iterations for the margins to converge. Notice how adding auxiliary information from a previous census produces estimates that are much closer to the observed flows (e.g., $\hat{n}_{34}$ = 67,082 versus n_{34} = 66,891, respectively) in comparison to those produced under the assumption of quasi-independence (e.g., $\hat{n}_{34}^{13}$ = 54,922 in Table 5).

The results presented in Table 6 illustrate the strong stability generally exhibited in origin-destination tables of migration over time (Raymer et al. 2006; Rogers et al., 2001; Tobler, 1995). In the next section, IPF is used to combine internal migration data obtained from health registers, censuses and surveys to produce five-way tables of migration flows. While these models are more complicated, the basic idea is the same in the sense that values contained in an offset (which may have more than two dimensions) are rescaled to fit a specified set of one- or two-way margins.

The general methodology proposed in this chapter begins by specifying a model for the migration flow table of interest. This first involves a review of the general migration literature and the context in which the migration is occurring. Where possible, the hypothesised model should then be tested against empirical data, which may be obtained from multiple sources. The testing can be undertaken by comparing various unsaturated hierarchical log-linear models fitted to the available migration flow tables. This framework will be illustrated in the next two (seemingly different) sections on combining migration data in England and estimating the international migration flows between countries in the European Union, respectively.

Table 5:   Iterative proportional fitting: Estimating 2000-2001 flows based on the 2000-2001 marginal totals and structural zeros (quasi-independence)

Iteration	Origin	Destination				Total
		North	Centre	South	London	
Offset	North	0	1	1	1	3
	Centre	1	0	1	1	3
	South	1	1	0	1	3
	London	1	1	1	0	3
	Total	3	3	3	3	12
0	North					128,632
(2000-2001 margins)	Centre					198,561
	South					191,838
	London					193,000
	Total	127,115	220,624	222,939	141,353	712,031
1	North	0	42,877	42,877	42,877	128,632
	Centre	66,187	0	66,187	66,187	198,561
	South	63,946	63,946	0	63,946	191,838
	London	64,333	64,333	64,333	0	193,000
	Total	194,466	171,157	173,398	173,010	712,031
2	North	0	55,270	55,128	35,032	145,429
	Centre	43,264	0	85,097	54,076	182,437
	South	41,799	82,428	0	52,245	176,472
	London	42,052	82,927	82,714	0	207,693
	Total	127,115	220,624	222,939	141,353	712,031
3	North	0	48,886	48,761	30,985	128,632
	Centre	47,087	0	92,618	58,855	198,561
	South	45,439	89,605	0	56,794	191,838
	London	39,077	77,060	76,862	0	193,000
	Total	131,603	215,551	218,241	146,635	712,031
13	North	0	49,728	49,466	29,439	128,632
	Centre	45,805	0	95,764	56,992	198,561
	South	44,141	92,775	0	54,922	191,838
	London	37,169	78,121	77,710	0	193,000
	Total	127,115	220,624	222,939	141,353	712,031

Table 6: Estimates of the 2000-2001 migration flows based on the 2000-2001 marginal totals and the 1990-1991 origin-destination association structures

| | Destination | | | | |
Origin	North	Centre	South	London	Total
North	0	63,473	41,698	23,461	128,632
Centre	61,639	0	86,112	50,810	198,561
South	42,366	82,390	0	67,082	191,838
London	23,110	74,760	95,130	0	193,000
Total	127,115	220,624	222,939	141,353	712,031

3. Population Movements in England

This section focuses on a log-linear model for combining aspects from multiple data sources to provide a detailed time series of migration flows. This approach has been used to study elderly retirement and return migration across twelve area groups in England and Wales since 2001 (Raymer et al. 2007), ethnic migration across nine regions in England from 1991 to 2007 (Raymer et al., forthcoming) and economic activity migration across 47 counties in England from 1999 to 2007 (Smith et al., 2010). The first two papers combined health registration data with census data. The third paper added information from the Labour Force Survey. The idea behind this methodology is similar to that described in Willekens (1994: 17-20), where census, survey and administrative data sets were combined to estimate inter-nal migration flows in the United States during the 1980s.

3.1 Available Data

In England, internal migration data are available in several sources, such as the decennial censuses, the National Health Service registers and the Labour Force Survey. Censuses contain much of the detail needed for analyses, but are only avail-able every ten years and have problems with compatibility over time for certain variables (Stillwell/Duke-Williams, 2007). Migration data from the population health registers are available annually, but with minimal information on migrant behaviour (i.e., only origin, destination, age and sex are available) and with a tendency to miss important population groups, such as young adult males, who are known to be less inclined to register (Fotheringham et al., 2004). However, the registration data constitute a good up-to-date source of internal migration as nearly

all residents in England are patients of a general practitioner employed by the National Health Service, including those who may also have private healthcare provision. The Labour Force Survey provides quarterly migration data with a rich detail of socioeconomic and demographic characteristics, including, for example, ethnic group, country of birth, occupation and wages. The major disadvantage of the Labour Force Survey for the purpose of studying internal migration is that the sample size is relatively small, which prevents analyses at higher levels of geography.

3.2 Models

The objective of the Raymer et al. (forthcoming) paper was to estimate migration flows for a series of five-way tables over time with the diagonals of the OD partial tables (i.e., the within-region flows) excluded (note, refer to Table 4 for description of variable notiatons used in this chapter). In essence, information from the health population registers was supplemented with more detailed information from censuses. In other words, the log-linear models combined marginal information available in the incomplete registration data with complete (but outdated) census data. In the Smith et al. (2010) paper, this approach was extended to also include association structures from a second auxiliary data source, i.e., the Labour Force Survey.

When modelling ethnic migration flows, Raymer et al. (forthcoming) allowed the three-way interaction structure between origin, destination and ethnicity (ODE) to vary over time (T) from 1991 to 2007 by using information from two censuses to geometrically interpolate the counts from 1992 to 2000 and to geometrically extrapolate forward from 2001. The log-linear-with-offset model used to estimate the flows is specified as:

$$
\begin{aligned}
\ln\!\left(\mu_{ijxyzt}^{ODASET}\right) = {} & \lambda + \lambda_i^O + \lambda_j^D + \lambda_x^A + \lambda_y^S + \lambda_t^T + \lambda_{ij}^{OD} + \lambda_{ix}^{OA} + \lambda_{it}^{OT} + \lambda_{jx}^{DA} \\
& + \lambda_{jt}^{DT} + \lambda_{xy}^{AS} + \lambda_{xt}^{AT} + \lambda_{yt}^{ST} + \lambda_{ijt}^{ODT} + \lambda_{ixt}^{OAT} + \lambda_{jxt}^{DAT} + \lambda_{xyt}^{AST} \\
& + \ln\!\left(\hat{m}_{ijzt}^{ODET}\right), \tag{8}
\end{aligned}
$$

where $\hat{m}_{ijzt}^{ODET}$ denotes the geometrically interpolated and extrapolated census counts.

Smith et al. (2010), when modelling economic activity migration flows (G) by origin, destination, age and sex, used the annual OD, OA, DA and AS tables from the health registration data (same as Raymer et al., forthcoming), the ODG associations from the 2001 Census and the annual AG and SG associations (and levels)

from the Labour Force Survey. They achieved this by first fitting the following log-linear-with-offset model:

$$\ln\left(\mu^*_{ijxyzt}\right) = \lambda + \lambda^A_x + \lambda^S_y + \lambda^E_z + \lambda^T_t + \lambda^{AG}_{xz} + \lambda^{AT}_{xt} + \lambda^{SG}_{yz} + \lambda^{ST}_{yt} + \lambda^{AGT}_{xzt}$$
$$+ \lambda^{SGT}_{yzt} + \ln\left(m^{ODG}_{ijz}\right), \tag{9}$$

where $\hat{m}^{ODG}_{ijz}$ denotes the 2001 census counts. This model provides an estimate of the counts in the ODASGT table, $\hat{\mu}^*_{ijxyzt}$, that have the same AGT and SGT associations as the Labour Force Survey and the same ODG associations as the 2001 Census. The natural logarithms of these counts were then used as an offset in the following model:

$$\ln\left(\mu^{ODASGT}_{ijxyzt}\right) = \lambda + \lambda^O_i + \lambda^D_j + \lambda^A_x + \lambda^S_y + \lambda^T_t + \lambda^{OD}_{ij} + \lambda^{OA}_{ix} + \lambda^{OT}_{it} + \lambda^{DA}_{jx}$$
$$+ \lambda^{DT}_{jt} + \lambda^{AS}_{xy} + \lambda^{AT}_{xt} + \lambda^{ST}_{yt} + \lambda^{ODT}_{ijt} + \lambda^{OAT}_{ixt} + \lambda^{DAT}_{jxt} + \lambda^{AST}_{xyt}$$
$$+ \ln\left(\hat{\mu}^*_{ijxyzt}\right). \tag{10}$$

This model combines the ODG, AGT and SGT association structures resulting from model (9) with the three-way ODT, OAT, DAT and AST association structures from the population health register. The resulting estimated flows exhibited all of the required association structures and were benchmarked to the levels in the health registration tables.

3.3 Results

In this section, some of the detailed migration flow estimates produced by Raymer et al. (forthcoming) and Smith et al. (2010) are presented. The estimates for ethnic migration represent flows between nine regions in England from 1991 to 2007 for the White, Black, South Asian and Other ethnic groups. The estimates for economic activity migration represent flows between 47 counties in England from 1999 to 2007 for the self employed, employee, unemployed, retired, other inactive and student groups. Both sets of estimates have been adjusted to correct for the male undercount in the young adult age groups. Refer to Raymer et al. (forthcoming) and Smith et al. (2010) for further details.

Consider first the time series of estimated female White and South Asian migration between the South East and London regions by age in Figure 1. Here, we see that

Whites, in any given year, have much higher levels of migration, because of their much larger population size, but their patterns have not changed much since 1991. Female South Asian migrants, on the other hand, have experienced large increases in their migration numbers over time, corresponding to large increases in their population stocks (Rees/Butt, 2004).

Next consider retiree migration. In Figure 2, the flows from Greater Manchester and Hampshire to the top ten destinations in 1999 are mapped. The size of each arrow is proportional to the share of migrants (within each group) that move to a particular county destination. Here, we see the spatial patterns of migration vary greatly depending on the origin of the migrants.

The predicted age patterns of employee, retired, inactive and student migration from Hampshire are set out for females in Figure 3 for the years 1999, 2003 and 2007. Here, we see in the top left panel that female employee migrants to Surrey decreased in the age groups 20-24 and 25-29 years, but increased in the 35+ year old age groups. The migration of retired and inactive migrants to Dorset did not exhibit any major changes over time. Finally, there was a very slight increase in the flows of 25-29 year old student migrants to London in 2007 relative to the other two years. Note that, unlike the age patterns ethnic migration set out in Figure 1, the age patterns of migration by economic activity vary greatly depending on the group being considered.

3.4 Summary

The above subsections have described a selection of estimated flows resulting from the fitting of Model (8) or Models (9) and (10). It is important to understand that these results have come about by combining information from population health registers, censuses, and the Labour Force Survey. This synthetic data base provides some indication about how the migration patterns of specific groups have evolved over time. Earlier studies that have examined such detailed origin-destination-specific migration flows have mostly relied on census data, which occurs only once every ten years. The results presented in this section provide additional years of data based on key structures available from the population health register and the Labour Force Survey, thus furthering the possibilities for analyses and planning.

Figure 1:   Estimated female White and South Asian migration between the South East and London regions in England by age: 1991, 1995, 1999, 2003 and 2007
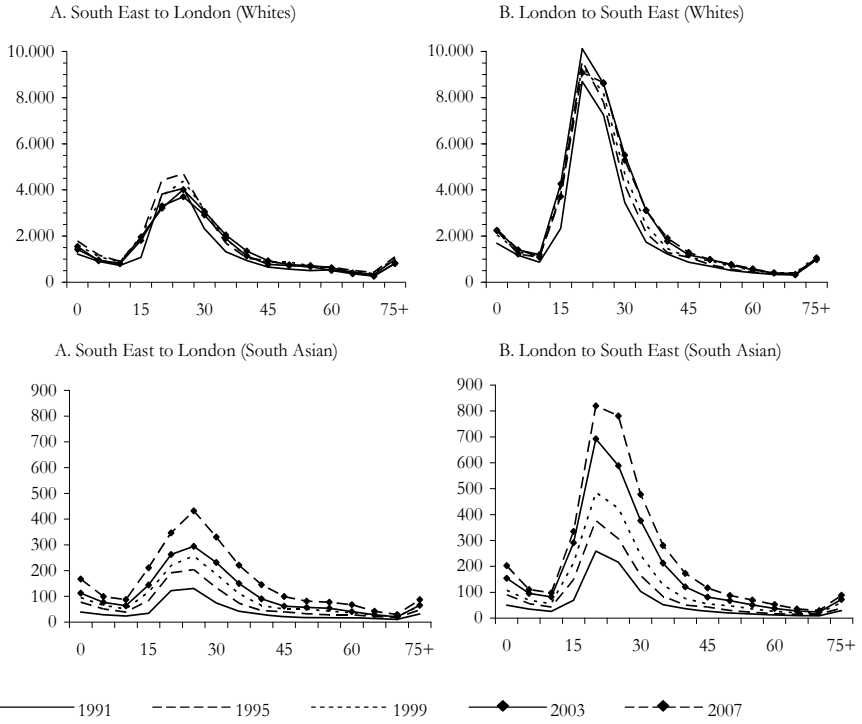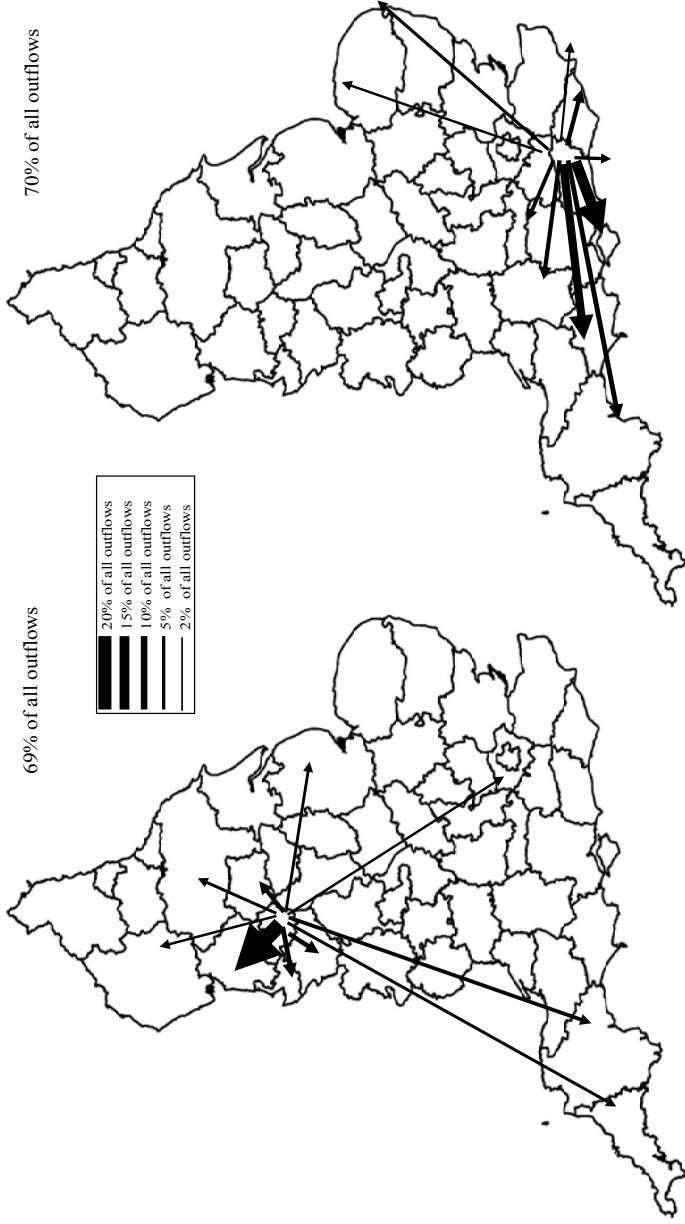
Figure 2: Spatial patterns of retired migrants from Greater Manchester and Hampshire (top 10 flows), 1999

69% of all outflows

70% of all outflows

20% of all outflows
15% of all outflows
10% of all outflows
5% of all outflows
2% of all outflows

Source: Smith et al. (2010, Figures 5b and 6b).

Figure 3:   Age patterns of migration from Hampshire: The top destinations for female employee, retired, inactive and student migrants, 1999, 2003 and 2007
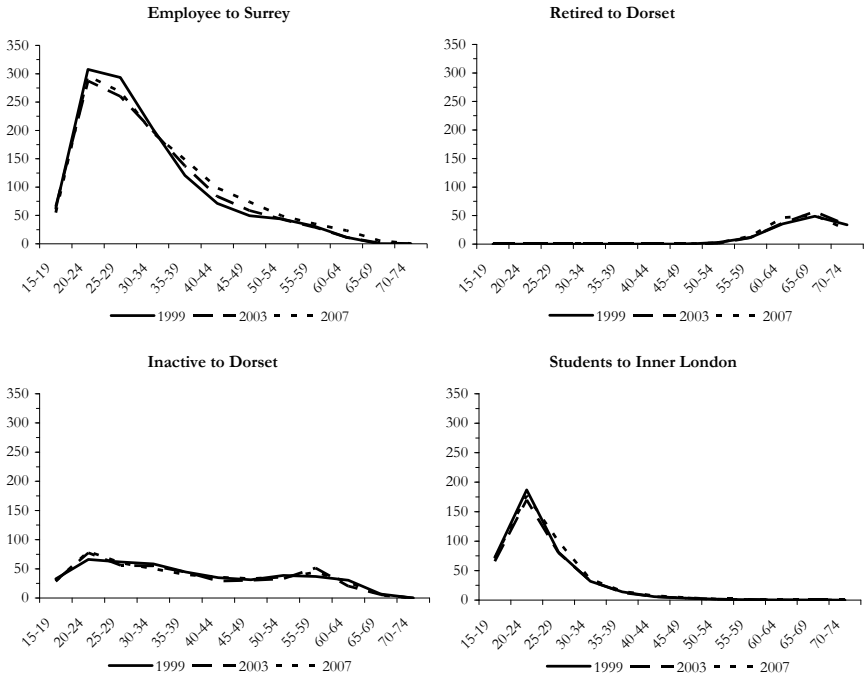
Source: Smith et al. (2010, Figure 12).

4. International Migration between European Union Countries

This section presents the international migration model developed as part of MIMOSA (MIgration MOdelling for Statistical Analyses), a three-year project funded by Eurostat intended to support the development and application of statistical modelling techniques for the estimation of missing data on migration flows and foreign population stocks. The project was coordinated by the Netherlands Interdisciplinary Demographic Institute (The Hague) and involved experts on migration statistics from the Central European Forum for Migration and Population Research (Warsaw), Southampton Statistical Sciences Research Institute and GéDAP at the Université Catholique de Louvain (Charleroi). This section presents one of the early modelling approaches adopted by the MIMOSA project to estimate international

migration flows between countries in the European Union, where the aim was to account for the many differences in definitions, quality and sources of available migration data, and to estimate the missing data.

In order to obtain an overall and consistent picture of the migration patterns occurring within Europe, a methodology was developed (i) to harmonise and correct for inadequacies in the available data and (ii) to estimate the missing patterns. In particular, a categorical data analysis approach was applied to the structures in the migration flow tables, representing the gross flows of immigration and emigration and the associations (or interactions) between countries. This section summarises the methodology and results described in Raymer and Abel (2008). Other useful references on harmonisation and the estimation of international migration in Europe include Kelly (1987), Poulain et al. (2006), Raymer (2007) and Raymer and Willekens (2008).

4.1 Available Data

The process of obtaining consistent international migration flow data involves overcoming two major data-related obstacles. First, the timing criterion used to identify international migrants varies considerably between countries (Kupiszewska /Nowok 2008). For population register data, international migration may refer to persons who have lived in a different country as much as three months, six months, or one year. For census or survey data, the entry date of international migrants is not known, only that they lived outside the country one-year or five years prior to the census or survey date.

Second, international migration statistics suffer from unreliability, mainly due to under-registration of migrants and data coverage (Nowok et al., 2006: 211-214). This is often caused by the collection method or by non-participation of the migrants themselves. Emigration data are particularly problematic because migrants may not notify the population register of their movement or may produce statements that are based on intentions. Surveys, such as the United Kingdom's International Passenger Survey, are particularly problematic for providing international migration data because the sample size must be very large in order to provide sufficient detail for analyses. Without a relatively large sample size, unexpected irregularities in the data are likely to appear, such as in the country-to-country-specific flows.

To provide an example of what the data look like, consider the subset of flows between ten countries in the European Union presented in Table 7. For each migration flow, there are two possible values: one reported by the receiving country (R) and one reported by the sending country (S). However, for the 2003 data, there are four data situations present: flows reported by both the receiving and sending

country (e.g., Czech Republic to Germany or Spain to Italy), flows only reported by the receiving country (e.g., flows from France or Greece), flows only reported by the sending country (e.g., flows to France or Greece) or no flows reported (e.g., Belgium to France or France to Belgium). Furthermore, where flows are available from both the sending and receiving countries, the numbers rarely match. For example, one might take the average of the two reported flows from Germany to Spain (i.e., 13,746 + 16,236 / 2) as a reasonable estimate, as the numbers are relatively close to each other. However to take the average of the two reported flows from Spain to Germany (i.e., 14,647 + 2,109 / 2) would most likely result in a very poor estimate. In this situation, one might consider one flow to be more accurate than the other. Deciding which flow is more accurate than the other has consequences for the other situations where only one reported flow is available, e.g., from Spain to Belgium or from France to Spain.

The objective of the Raymer and Abel (2008) paper was to estimate a series of origin-destination-specific migration flows from 2002 to 2005 (i.e., the ODT table), with the diagonals of the OD partial tables excluded. As illustrated in Table 7, the data available to them were of very poor quality. In fact, only thirteen countries provided immigration and emigration data for all four years. Austria, Luxembourg and Iceland also provided data but only for some years (i.e., 2004-2005, 2003-2005 and 2002, respectively). Data for the remaining fifteen countries were missing. Furthermore, out of all the countries providing data, only Sweden provided both accurate data and data with a one-year definition in line with the United Nations (1998) recommendations. For many of the other countries providing data, the definitions were not consistent or clear, even for countries with accurate registration systems. For example, Finland used a one-year timing criterion for emigration and immigration of non-nationals but for immigration of nationals, there was no timing criterion required. The Netherlands used a one-year definition for emigrants, but immigrants were defined based on a six-month criterion.

4.2 Models

The first step in the modelling strategy in Raymer and Abel (2008) was to clean and harmonise the available data. The harmonisation procedure was based on a simple iterative method developed by van der Erf and van der Gaag (2007), where reliable receiving country or sending country data were used to adjust the less reliable data. This technique assumes that the user knows the relative reliability of the various sources in the migration flow tables. The resulting adjustments to the reported data were in some cases substantial, ranging from 0.76 for Germany's immigration data (i.e., a reduction in the levels) to 7.43 for Latvia's emigration data (i.e., a large increase in the levels).

Table 7: Double-entry matrix for selected countries in the European Union, 2003

From		BE	CZ	DK	DE	EE	GR	ES	FR	IE	IT
					Destination						
BE	R		80	587	4,291	…	…	3,037	…	…	1,959
	S		…	…	…	…	…	…	…	…	…
CZ	R	…		232	9,258	…	…	388	…	…	915
	S	78		47	950	2	66	70	283	31	197
DK	R	…	65		2,693	…	…	764	…	…	281
	S	511	180		2,540	133	229	1,720	1,333	264	782
DE	R	…	1,228	3,221		…	…	13,746	…	…	12,902
	S	4,623	8,909	2,712		597	18,106	16,236	19,060	2,415	33,802
EE	R	…	4	169	947		…	60	…	…	103
	S	…	…	…	…		…	…	…	…	…
GR	R	…	57	278	12,959	…		273	…	…	638
	S	…	…	…	…	…		…	…	…	…
ES	R	…	103	1,665	14,647	…	…		…	…	2,051
	S	647	34	130	2,109	4	38		2,474	487	801
FR	R	…	462	1,488	18,133	…	…	8,847		…	4,647
	S	…	…	…	…	…	…	…		…	…
IE	R	…	45	306	2,046	…	…	1,649	…		292
	S	…	…	…	…	…	…	…	…		…
IT	R	…	274	895	23,702	…	…	5,796	…	…	
	S	1,414	20	155	9,778	1	211	895	2,933	130	

Notes: R = receiving country's reported flows; S = sending country's reported flow; … = no reported data available; BE = Belgium, CZ = Czech Republic, DK = Denmark, DE = Germany, EE = Estonia, GR = Greece, ES = Spain, FR = France, IE = Ireland and IT = Italy.

The harmonised available data were then used to estimate the missing data. Here, the strategy was to first model the margins of the migration flow table and then the origin-destination associations, i.e., components of the multiplicative model:

$$n_{ij} = (T)(O_i)(D_j)(OD_{ij}) = (e_{ij})(OD_{ij}) \,, \tag{11}$$

where e_{ij} denotes the expected flows resulting from the marginal total information. Once the T, O_i and D_j components were estimated, the expected flows were obtained using iterative proportional fitting to account for the zeros in the diagonal elements of the tables.

The missing totals of immigration and emigration (i.e., $(T)(O_i)$ and $(T)(D_j)$, respectively) were estimated using ordinary least squares regression with the harmonised available margins (in natural logarithmic form) as the dependent variable and population size (natural logarithm), percentage 65+ years, life expectancy (females), GDP (relative) and percentage urban as the explanatory variables. Note, migration flows within the European Union system and from / to rest of world were estimated separately. Some adjustment was also necessary to ensure that the immigration and emigration totals matched for the European table. The missing origin-destination associations were estimated using regression with the available origin-destination associations (in natural logarithmic form) as the dependent variable and contiguity, distance (natural logarithm), language family, GNI PPP ratios (natural logarithm), foreign-born population and trade associations (natural logarithms) and year as the explanatory variables. The available origin-destination associations were calculated as the ratio of available harmonised flows to expected flows. The expected flows were calculated by using the harmonised and estimated margins of the within Europe tables.

4.3 Results

The results show that migration within the European Union steadily increased from 2.39 million persons in 2002 to 2.67 million persons in 2005, whereas the migration from and to the rest of the world remained around the same levels, i.e., 2.23 million immigrants and 1.11 million emigrants (on average). In total, there were 4.58 million persons who migrated in 2002, 4.81 million persons in 2003, 4.93 million persons in 2004 and 4.87 million persons in 2005. The net migration from rest of world amounted to 1.1 to 1.2 million each year during the four years.

The methodology produced a set of complete and harmonised estimates of migration flows between 31 countries in Europe from 2002 to 2005. These flows maintained the levels and spatial patterns of reliable data (e.g., Nordic countries) and (we believe) improved the data situation for countries providing very poor data (e.g., Poland) or no data at all (e.g., France). To illustrate the type of estimates produced by the methodology, the flows from Poland and France are set out in Figures 4 and 5, respectively. In in 2002, emigrants from Poland (Figure 4) chose Germany and the rest of the world as their top two choices. In 2005, the United Kingdom followed Germany as the second most attractive destination. The estimated patterns of migration from France, on the other hand, showed the importance of migration from the rest of the world, which declined from around 100 thousand before 2004 to around 80 thousand after 2004. The other top destinations for migrants from France were large countries, such as Germany, Italy, the United Kingdom and Spain.

Figure 4:   Estimated emigration flows from Poland (top 15 destinations), 2002-2005
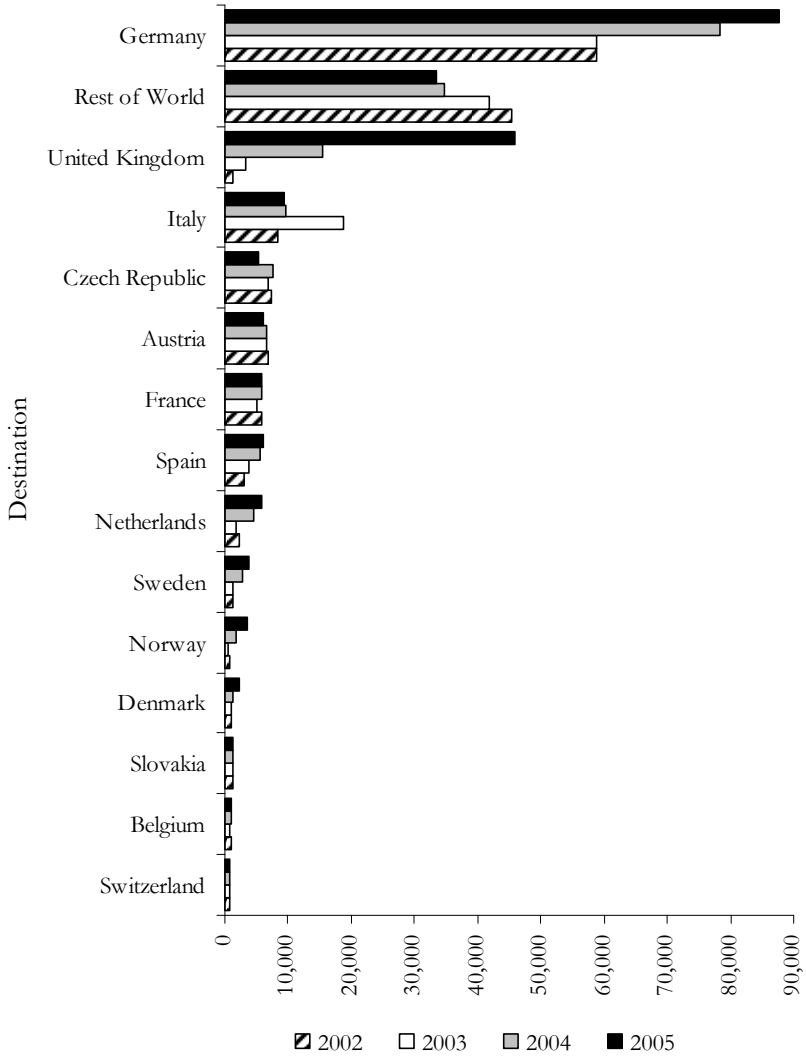
Source: Raymer and Abel (2008).

Figure 5:   Estimated emigration flows from France (top 15 destinations),
                2002-2005
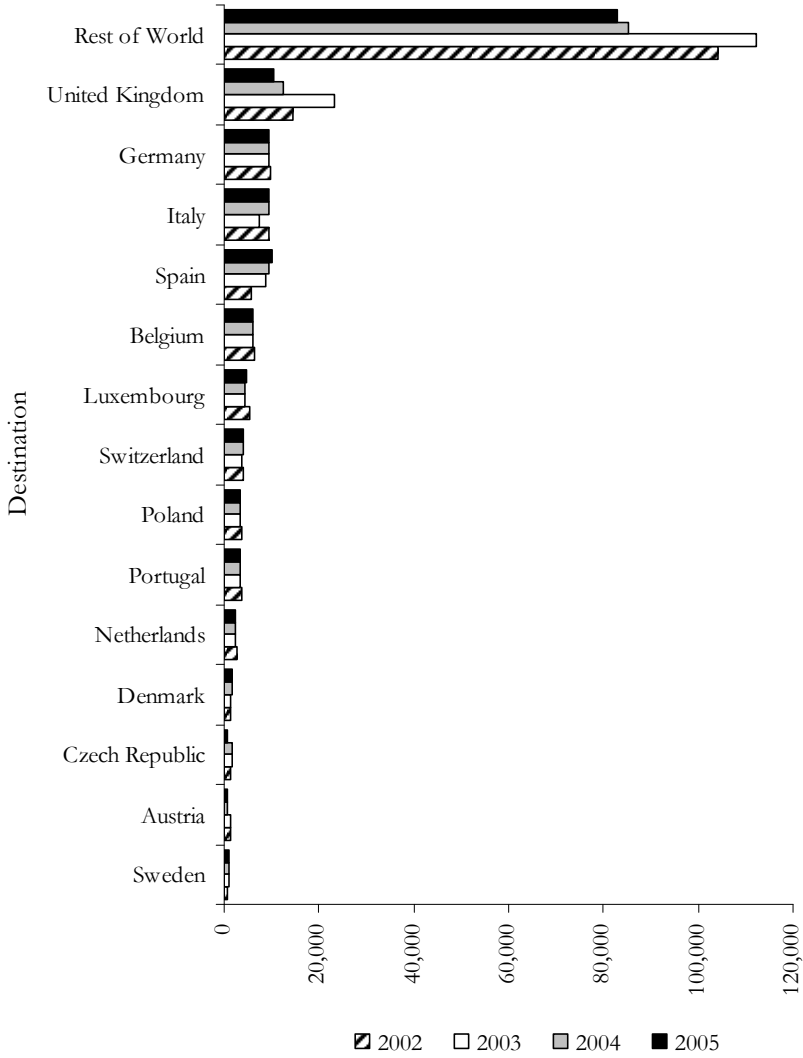
Source: Raymer and Abel (2008).

4.4 Summary

In order to produce an overall picture of European Union migration, one has to address issues concerning availability, quality and consistency of migration data. These obstacles were overcome by first cleaning and harmonising the reported flows and then by estimating the missing data using simple regression models. International migration estimation is a complicated task but an important one. The multiplicative component procedure simplified the process by allowing the user to maintain control during the estimation process.

5. Conclusion

In this chapter, a flexible framework for combining migration data and for dealing with inadequate or missing data has been presented. This framework can accommodate different types of migration, levels of detail, geography and sources of information. The results are synthetic and harmonised data bases that take advantage of several available data sources and covariate information. The combination of multiple data sources increases our capacity to study migration and population change. To combine data, however, one must first address issues concerning consistency, availability and quality. This chapter has illustrated how, by focusing on gross flows and underlying structures, the log-linear model framework can be used to estimate both internal and international migration.

Future work on estimating population movements should focus on the integration of covariate information and measurement of uncertainty within this model framework. Here, adopting a Bayesian statistical approach appears to provide the best opportunities for success. First, the methodology offers a coherent and probabilistic mechanism for describing various sources of uncertainty contained in the various levels of analyses. These include the migration processes, models, model parameters, expert judgments and so on. Second, the methodology provides a formal mechanism for the inclusion of expert judgement to supplement the deficient migration data (Willekens, 1994). The author of this chapter, along with colleagues in the Southampton Statistical Sciences Research Institute (S3RI), the Netherlands Interdisciplinary Demographic Institute (NIDI) and the University of Oslo are currently pursuing an integrated Bayesian modelling approach through a recently funded project by NORFACE (New Opportunities for Research Funding Agency Co-operation in Europe) entitled "IMEM: Integrated Modelling of European Migration."

References

Agresti, A. (2002): Categorical data analysis, 2nd edition. Wiley: Hoboken.

Agresti, A. (2007): An introduction to categorical data analysis, 2nd edition. Wiley: Hoboken.

Bell, M./ Blake, M./ Boyle, P./ Duke-Williams, O./ Rees, P./ Stillwell, J./ Hugo, G. (2002): Cross-national comparison of internal migration: Issues and measures. In: Journal of the Royal Statistical Society Series A 165, 435-464.

Fienberg, S.E. (1980): The analysis of cross-classified categorical data, 2nd edition. M.I.T. Press: Cambridge. Reprinted by Springer-Verlag: New York (2007).

Fotheringham, A.S./ Rees, P./ Champion, T./ Kalogirou, S./ Tremayne, A.R. (2004): The development of a migration model for England and Wales: Overview and modelling out-migration. In: Environment and Planning A 36, 1633-1672.

Kelly, J.J. (1987): Improving the comparability of international migration statistics: Contributions by the Conference of European Statisticians from 1971 to date. In: International Migration Review 21, 1017-1037.

Kupiszewska, D./ Nowok, B. (2008): Comparability of statistics on international migration flows in the European Union. In: Raymer, J./ Willekens, F. (eds.): International migration in Europe: Data, models and estimates. Chichester: Wiley, 40-71.

Nowok, B./ Kupiszewska, D./ Poulain, M. (2006): Statistics on international migration flows. In: Poulain, M./ Perrin, N./ Singleton, A. (eds.): THESIM: Towards Harmonised European Statistics on International Migration. Louvain: UCL Presses, 203-231.

Poulain, M./ Perrin, N./ Singleton, A. (2006): THESIM: Towards Harmonised European Statistics on International Migration. Louvain: UCL Presses.

Raymer, J. (2007): The estimation of international migration flows: A general technique focused on the origin-destination association structure. In: Environment and Planning A 39, 985-995.

Raymer J and Abel G (2008) The MIMOSA model for estimating international migration flows in the European Union. Joint UNECE/Eurostat Work Session on Migration Statistics, Working paper 8. Geneva: UNECE / Eurostat. available at http://www.unece.org/stats/documents/ece/ces/ge.10/2008/wp.8.e.pdf.

Raymer, J./ Abel, G./ Smith, P.W.F. (2007): Combining census and registration data to estimate detailed elderly migration flows in England and Wales. In: Journal of the Royal Statistical Society Series A 170, 891-908.

Raymer, J./ Bonaguidi, A./ Valentini, A. (2006): Describing and projecting the age and spatial structures of interregional migration in Italy. In: Population, Space and Place 12, 371-388.

Raymer, J./ Rogers, A. (2007): Using age and spatial flow structures in the indirect estimation of migration streams. In: Demography 44(2), 199-223.

Raymer, J./ Smith, P.W.F./ Giulietti, C. (forthcoming): Combining census and registration data to analyse ethnic migration patterns in England from 1991 to 2007. In: Population, Space and Place. DOI: 10.1002/psp.565.

Raymer, J./ Willekens, F. (2008): International migration in Europe: Data, models and estimates. Chichester: Wiley.

Rees, P./ Butt, F. (2004): Ethnic change and diversity in England, 1981-2001. In: Area 36, 174-186.

Rogers, A./ Willekens, F.J./ Little, J.S./ Raymer, J. (2002a): Describing migration spatial structure. In: Papers in Regional Science 81, 29-48.

Rogers, A./ Willekens, F.J./ Raymer, J. (2001): Modeling interregional migration flows: Continuity and change. In: Mathematical Population Studies 9, 231-263.

Rogers, A./ Willekens, F.J./ Raymer, J. (2002b): Capturing the age and spatial structures of migration. In: Environment and Planning A 34, 341-359.

Rogers, A./ Willekens, F.J./ Raymer, J. (2003): Imposing age and spatial structures on inadequate migration-flow datasets. In: The Professional Geographer 55(1), 56-69.

Smith, P.W.F./ Raymer, J./ Giulietti, C. (2010): Combining available migration data in England to study economic activity flows over time. In: Journal of the Royal Statistical Society Series A 173.

Stillwell, J./ Duke-Williams, O. (2007): Understanding the 2001 UK census migration and commuting data: the effect of small cell adjustment and problems of comparison with 1991. In: Journal of the Royal Statistical Society Series A 170, 1-21.

Tobler, W. (1995) Migration: Ravenstein, Thornthwaite, and beyond. In: Urban Geography 16(4), 327-343.

United Nations (1998): Recommendations on statistics of international migration. Statistical Papers Series M, No. 58, Rev. 1. Statistics Division, Department of Economic and Social Affairs, United Nations, New York.

van der Erf, R./ van der Gaag, N. (2007): An iterative procedure to revise available data in the double entry migration matrix for 2002, 2003 and 2004. MIMOSA Discussion Paper, Netherlands Interdisciplinary Demographic Institute, The Hague.

van Wissen, L./ van der Gaag, N./ Rees, P./ Stillwell, J. (2008): In search of a modelling strategy for projecting internal migration in European countries. In: Poot, J./ Waldorf, B./ van Wissen, L. (eds.): Migration and human capital. Cheltenham: Edward Elgar, 49-74.

Willekens, F. (1983): Log-linear modelling of spatial interaction. In: Papers of the Regional Science Association 52, 187-205.

Willekens, F. (1994): Monitoring international migration flows in Europe: Towards a statistical data base combining data from different sources. In: European Journal of Population 10, 1-42.

Willekens, F. (1999): Modeling approaches to the indirect estimation of migration flows: From entropy to EM. In: Mathematical Population Studies 7(3), 239-278.

Acknowledgements

The Impact of Migration on Birth Replacement - The Spanish Case

Alberto del Rey Poveda, José Antonio Ortega

1. Introduction

Studies of reproduction and population replacement have focused mainly on the demographic situation of western countries. In the past, research on reproduction has dealt primarily on the interrelationship of fertility and mortality. The examination of fertility and mortality conditions were usually interpreted in terms of future implications: reproduction indicators were considered as hypothetical long-term consequences, for example. Reproduction indicators were initially concerned with the excessive population growth caused by high fertility levels and, more recently, with the low or very low fertility that suggested negative growth scenarios. Migration was only a minimal consideration in these previous studies.

For the majority of western countries today, demographic dynamics are defined by low levels of fertility and mortality. In this context, migration is the main determinant factor in population growth because it affects the contribution of fertility, marriage and mortality to population change. The interrelationship of migration, fertility, marriage, and mortality has been the subject of a large number of recent demographic studies on immigrant populations and the effect of immigration on origin and destination populations.

One of the main current challenges is to incorporate the migration component in demographic dynamics and to construct indicators that are sensitive to the effects of migration (Preston/Wang, 2007). There have been some attempts in the past to incorporate migration effects, such as: Social Replacement Rate has been proposed by Hyrenius (1951); Reproduction Ratios at different ages have been proposed by Sardon (1991); and Reproduction Ratios under different net migration scenarios have been also proposed by Ryder (1997). But none of these proposed indicators deals adequately with the problems mentioned above because they take migration into account as a constant or propose hypothetical scenarios. From this perspective, recent work on the Birth Replacement Ratios, called *BRR* (Ortega, 2006; Ortega/del Rey, 2006, 2008) is an indicator that provides information on the reproductive situation of a population based on the observed fertility levels. Birth

Replacement Ratios also take into account conditions of mortality, fertility and the effect of migration on the female population at childbearing ages.

This paper shows two applications of the *BRR* to Spain during the 20th and the beginning of the 21st centuries. We analyze the population replacement situation for Spain in order to estimate the effect of international migration and we study regional and provincial variations in order to that analyze the unequal effects of internal and international migration on population growth in Spain.

Spain, a country with a long history of emigration, has become a country of immigration in the last two decades (Muñoz-Pérez/Izquierdo, 1989; Blanco, 1993; Sánchez-Alonso, 2000; Arango/Martin, 2005). In 1998, Spain had around 600,000 foreigners that represented 1.6 per cent of the population, while on 1 January 2008, this number was 5.2 million foreign residents in Spain, representing 11 per cent of the Spanish population. Because of increased net immigration, the possibility of negative growth that existed in the 1990s due to low fertility (Kohler et al., 2002) has, in fact, resulted in strong population growth between 1998 and 2008, with population increases from 39.8 million to 46.1 million - 73.8 per cent of this growth was due to immigration.

Current demographic dynamics in Spain are greatly affected by international migration. Nevertheless, at a regional and provincial level, internal migration has been and continues to be in many cases the factor that has determined population growth and is the most important factor from the standpoint of reproduction and replacement of population generations.

The next section discusses the most commonly used population replacement indicators. This is followed by the presentation of the birth replacement methodology. Next, we analyze the birth replacement indicators in Spain and in different selected regions and provinces. Finally, we draw some conclusions.

2. Demographic Replacement Indicators

The traditional demographic indicators used to analyze population reproduction are the population growth rate, the total fertility rate and the net reproduction rate. They each have important limitations for dealing with birth replacement dynamics when there is moderate or high migration.

1) The Population Growth Rate (PGR) is an aggregate indicator that establishes the relation of the population at a particular moment with regards to a specific previous period. It does not provide information about population replacement.

2) The Total Fertility Rate (TFR) indicates the average number of children per woman. The *TFR* indicates the number of children a woman will have in her lifetime if the fertility rates for a particular year remain constant. It assumes constant fertility rates

and does take migration or mortality into consideration. It is obtained by adding together the single-year age-specific birth rates at a given period of time.

The *TFR* is a demographic indicator that is mostly used in to analyze the reproduction of a population that has low mortality conditions. A theoretical value of 2.1 children per woman is the required rate to replace a population with low mortality. This value is based on the number of births required to replace both the mother and the father and is slightly above 2 due to the sex ratio at birth (there is an excess of boy over girl births in human populations). In stable and closed populations with constant rates of fertility and mortality and zero migration, a *TFR* over 2.1 indicates an increase in the number of births over time. In populations with a high mortality the theoretical replacement value, however, must be higher than 2.1.

The *TFR* is a synthetic measure. It is not based on the fertility of an actual cohort of women. Nor is it based on the sum of the total number of children actually born over their lifetime. Instead, it is based on the age-specific fertility rates of women in their "child-bearing years", such as the ages between 15 and 49 years for a particular period of time.

The *TFR* does not provide a valid replacement indicator when there are conditions of high mortality or where there is significant migration. A particular population might be drastically reduced due to mortality and/or migration but nevertheless the *TFR* might not be affected. The reason is that *TFR* is the result of the ratio between births and women, even though the number of births has drastically reduced. Likewise, the arrival of a large number of immigrants might cause an increase in the number of births, but the *TFR* might show very little change. In either case, the *TFR* is relatively insensitive to these situations, except when migrant women (both emigrants and immigrants) have fertility levels that are very different from those of the resident women.

3) The Net Reproduction Rate (NRR) is an alternative replacement measure, which quantifies the number of daughters a woman would have over her lifetime if she were subject to prevailing age-specific fertility and mortality rates in a specific period of time. When the *NRR* is exactly 1 then each generation of women exactly reproduces itself.

Using the *NRR* as a replacement indicator presents some serious problems. First, it is a synthetic and forecast indicator that assumes constant fertility and mortality rates that are highly improbable for a population. Second, it includes a period mortality indicator instead of cohort mortality. If mortality is improving, then the *NRR* is over-estimated because period mortality is lower than past cohort or "real" mortality. Third, and in the same way the *TFR*, it does not take into account the effects of migration.

Previous demographic indicators, as we have argued above, present serious problems for studying the effect of migration on population replacement. Therefore, we propose the use of *the Birth Replacement Ratio* (*BRR*). First, it is an indicator

that compares an observed cohort of births for a particular year with an observed generation of mothers (calculated by their population size also at birth), without the need to provide hypothetical scenarios or synthetic generations. Second, the *BRR* is affected by variations in mortality and in migration of the past, as well as factors that influence the number of women at childbearing age in a particular year. The observed number of women in the population determines the number of children registered according to their fertility rates. Third, in work presented below, we propose methods for the decomposition of the *BRR* indicator that use cohort mortality levels, which avoids problems of over-estimating future mortality conditions.

3. Method and Data

3.1 Method: The Birth Replacement Ratios

We use the birth replacement methodology in this paper with three objectives: First, we analyze period population replacement taking into account mortality, fertility and migration. Second, we calculate migration effects through the decomposition of the *BRR*. And third, we generate several intermediate indicators which incorporate the effects of migration.

1) We first analyze the reproductive situation of the population. For this, we want to see if the number of births for each year (B_t) replaces the births of the mothers' generation (BG_t):

$$BRR_t = B_t \ / \ BG_t. \qquad (1)$$

A value of 2.05 means that the number of births for year t will replace the births of the parents, taking into account a sex ratio at birth of 105 boys per 100 girls.

Given that each woman has children, not just in one year but also throughout her childbearing age, between 15 and 49 years, births of the mothers ($B_{(t-x)}$) are weighted each year by the level of fertility, i.e., according to their contribution to the number of births every year (F_x). We take this concept from Calot's (1984) interpretation of the *TFR* as a period replacement indicator. This *TFR* interpretation compares children with their mothers weighted according to their fertility rates:

$$TFR_t = B_t / \ G_t; \quad \text{where } G_t = \Sigma[F_x(t)/TFR_t] \times E_x(t), \qquad (2)$$

where B_t is the total number of births; G_t is the weighted average of female population; $F_x(t)$ represents the age-specific fertility rate for age x in year t; $E_x(t)$ are the woman-years at risk of having children by age.

The *BRR* uses the same weighted rates (F_x) that G_t, but now applied to the population of mothers at birth ($B^f_{(t-x)}$). BG_t is the mother's generation size at birth.

$$BG_t = \Sigma[F_x(t)/TFR_t] \times B^f_{(t-x)} \qquad (3)$$

In this case, t represents years from 1908 to 2005 and x represents ages from 15 to 49 (this means that we have taken female births ($B^f_{(t-x)}$) from 1858 to 1990).

In the situation in which we compare only female births with births of mothers, the theoretical replacement level would be 1 and this would allow us to make comparisons with the *NRR*.

$$NBRR_t = B^f_t / BG_t \qquad (4)$$

2) We decompose the *BRR* into several components to measure the effect of migration. The first decomposition allows us to estimate the effects of migration. First, using the fertility rates and number of births, we estimate the female population at child-bearing ages for each year (G_t) according to Calot's concept of *TFR* as the replacement period indicator. Taking Calot's interpretation,

$$TFR_t = B_t/G_t, \qquad (5)$$

we obtain the observed women:

$$G_t = B_t/TFR_t. \qquad (6)$$

Second, once we know the number of female births and the cohort mortality to which women have been exposed, we can estimate the expected number of women of child-bearing-age year by year (G^{Surv}_t):

$$G^{Surv}_t = \Sigma 0.5[L_x(t-x) + L_{x+1}(t-x)] * [F_x(t)/TFR_t] * B^f_{(t-x)}, \qquad (7)$$

where $L_x(t-x)$ and $L_{x+1}(t-x)$ are the population of female survivors in the cohort mortality table at ages x and x+1 respectively.

The difference between the observed number of women (G_t) and the expected number of women (G^{Surv}_t) is the net migration factor:

$$k^{NetMig}_t = [G_t / G^{Surv}_t] - 1. \qquad (8)$$

If we have information regarding the female population by place of birth, as happens in the Spanish census years of 1981, 1991 and 2001, it is possible to separate the effects of internal immigration, international immigration (second decomposition) and emigration from the region (third decomposition).

The second decomposition refers to observed women (G_t) divided into three groups according to the place of birth: natives or women born in the same province (*Nat*), internal migrants or women born in other Spanish provinces (*Spa*) and foreign or women born abroad (*For*):

$$G_t = G^{Nat}_t + G^{Spa}_t + G^{For}_t. \tag{9}$$

Again, we use Calot's interpretation of the *TFR* to calculate each of the components ($G^*_t = B^*_t / TFR^*_t$). We assume the same fertility levels for natives and internal migrants. By contrast, we have estimated the total fertility rate for foreign women.

The third decomposition refers the effect of emigration at at a regional and provincial level. This factor is calculated by taking into account the relation between observed number of native women and expected number of women (based on the number of women born in the region or province, taking mortality into account):

$$K^{Emig}_t = 1 - [G^{Nat}_t / G^{Surv}_t]. \tag{10}$$

We assume the same fertility rates for those women who have emigrated and for those remaining in the same province.

3) Lastly, we generate two indicators that consider the effect of migration: First, once we know the migration factor, we can measure the effect on the replacement ratio as a result of the difference between the registered *BRR* and the expected *BRR* (*BRR*^{NoMig}):

$$BRR^{NoMig}_t = TFR_t * G^{NoMig}_t / BG_t. \tag{11}$$

The difference between the *BRR* and the *BRR*^{NoMig} provides the number of children "gained" or "lost" per woman due to the effect of migration.

Second, we calculate the Equivalent Total Fertility Rate (*ETFR*), which is the fertility rate corrected by the effect of migration, by noting the relationship between the number of observed children and the number of expected women:

$$ETFR_t = TFR_t (1 + k^{NetMig}_t) = B_t / G^{Surv}_t. \tag{12}$$

3.2 Data

The data required to construct the *BRR* indicators are births (taken, in this case, from Spanish birth registers), the *TFR*, fertility rates by age, and cohort mortality levels for the female population. The female population by age and place of birth are required for the decomposition.

In the Spanish case, we have used births from 1858 and later by province and region, using vital statistics from the Spanish National Institute of Statistics (INE). For some years without data, we have estimated the number of births by using interpolations or provincial birth rates from the INE.

The *TFR* for each province and region between 1975 and 2005 has been taken from INE. We have used Calot's interpretation of the period replacement to estimate the *TFR* by province from 1908 to 1974. The weighted rates of G_t (specific fertility rates by age) have been taken from Eurostat (between 1971 and 1974) and for the period before 1971 from Festy (1979).

Female cohort mortality has been estimated with mortality rates for Spain taken from the Human Mortality Database. To calculate the provincial and regional tables the source has been Dopico and Reher (1998) for the period 1900-1930 and the data published by Blanes (2007) for the period 1960-2002. The female population by age and place of birth has been taken from the Spanish Population Census for 1981, 1991 and 2001 (INE).

4. Analysis of Birth Replacement in Spain: National, Regional and Provincial

Spain offers an illustrative example for the comparison of birth replacement indicators with traditional demographic indicators. Analysis at a national level allows us to estimate the effect of general changes that occurred in the national demographic dynamics on birth replacement during the 20th and beginning of the 21st centuries. During this period, Spain experiences dramatic changes in fertility and mortality and was transformed from an emigration country to an immigration country. Analysis at the regional and provincial levels show differences in population replacement as affected by internal and international migration.

Figure 1:   Total Fertility Rate and relative number of births in Spain 1908-2005

Number of births in 1908 = 100.
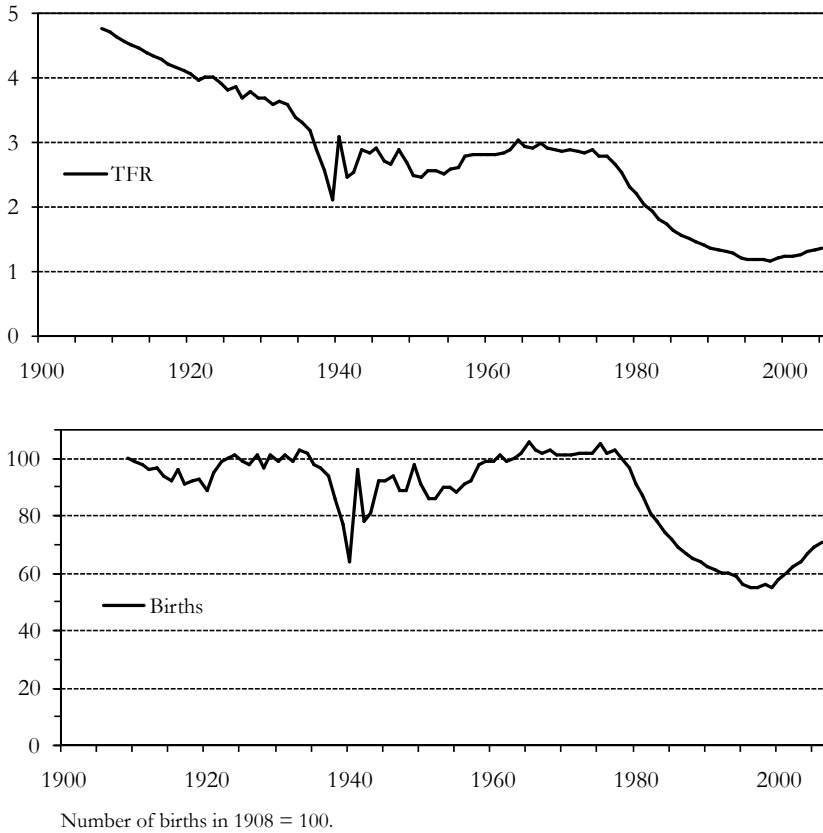
The first aspect to point out at a national level is that the *TFR* has declined from 4.8 children per women at the beginning of the 20th century to 1.3 in 2005 (figure 1). We can distinguish two different periods. From the beginning of the 20th century to 1940, the *TFR* decreased and stabilized at around 3 children per woman (with the exception of the Spanish Civil War 1936-1939 when fertility was unusually low). In the second period between the mid-1970s until the mid-1990s, the *TFR* was below the replacement level after 1980, reaching a minimum below 1.2 children per

woman in 1998. According to this indicator, the reproduction level in Spain during the main part of the period analyzed has been considerably above the theoretical replacement level: in the early part of the 20th century, Spain's *TFR* was high enough that one would have theoretically expected a generational doubling of the population. With regard to the number of births, however, this has not followed the same trend as the *TFR* because of the effect of mortality and migration.

Figure 2: Spain 1908-2005: Average survival at motherhood – [cohort index (L^{coh}) and period index (L^{per})] – and net migration factor of women between 15-49 years (K^{NetMig})
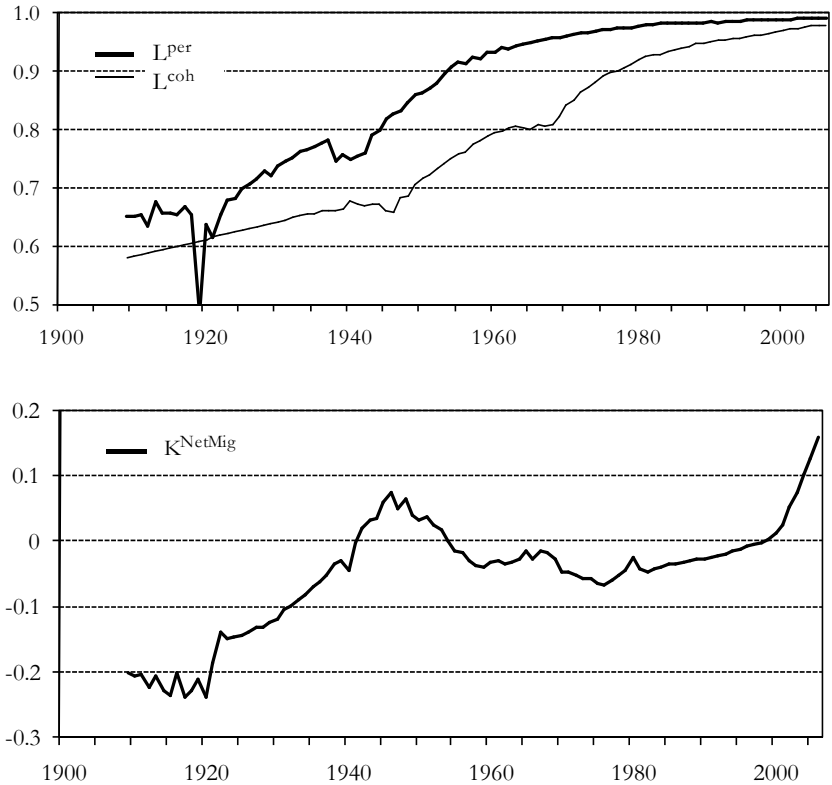
Average survival at motherhood (L^{per} and L^{coh}) = 27.5 years.

1) If we observe mortality change in Spain using the survival rate from birth to the average age at motherhood (27.5 year), we notice a sharp increase (figure 2). At the beginning of the 20th century, the survival rate was around 0.6 (where the period indicator L^{per} is higher than that of the cohort L^{coh}). At present, the survival rate is close to 1. In other words, only 6 out of 10 women survived to motherhood at beginning of the 20th century, while today practically all women survive. This situation has an important effect on the number of children that a female cohort will produce.

In higher mortality conditions, the *NRR* is a more appropriate indicator than the *TFR*. Nevertheless, when using period mortality instead of the cohort mortality, the *NRR* is an overestimated indicator from a generational replacement point of view, as we can observe in the differences between L^{coh} and L^{per} in figure 2. Between 1944 and 1955, the period of largest decline in mortality in Spain, the differences between period and cohort indicator exceeds 15 per cent. At present, in a situation of low and stable levels of mortality, the difference is one per cent. This situation means that the *NRR* overestimates population replacement in the case of Spain for most of the 20th century (figure 3), and even more so if migration effects are taken into account.

The *NRR* allows us to observe, however, that decline of fertility rates does not imply a decline in the number of births (figure 1). The number of births for 1908 was similar to that for the decades between 1920-1930 and 1960-1970, and the highest number of births registered in Spain was between 1960 and 1970. The explanation for this lack of correspondence is that the decline of mortality, to a large extent, was counterbalanced by fertility decreases, which can be observed in the stability of the *NRR* until the 1960s (figure 3). The *NRR* was higher than 1 until 1980, except for 1918 – the year affected by the Spanish flu, and for the period of the Spanish Civil War. In the first third of the 20th century, despite very high fertility, the *NRR* was scarcely higher than 1, and the later drop in fertility did not imply a decrease in the *NRR* given the increase of survival. This demonstrates the important effect of mortality on the population replacement indicators.

2) On another hand, the number of women that reached the average age of motherhood has been affected by migration (figure 2). In the first quarter of the 20th century, the net migration rate was about - 0.2. This implies a loss of 20 per cent of women due to emigration in relation to the expected women according to their mortality conditions (which, at the same time, implies a 40 per cent reduction in the survival of a birth cohort of women to motherhood[1]). The opposite situation

---

1 Taking the conditions of mortality and migration in Spain in 1910, the combined effect of the period mortality and migration means a reduction of 34.7 % of women of childbearing age in relation to girls

occurs at the beginning of the 21st century. At present, the migration rate exceeds 0.1, which means an increase of 10 per cent in the female population as a consequence of immigration.

The two situations above have an important effects on the total number of births registered for these periods as shown by the *BRR* and the *NBRR* (figure 3), although it does not mean that they affect the average number of children per woman or the *TFR* as indicated above.

Figure 3:   Spain 1908-2005: Birth Replacement Ratio (BRR), Net Birth Replacement Ratio (NBRR) and Net Reproduction Rate (NRR)
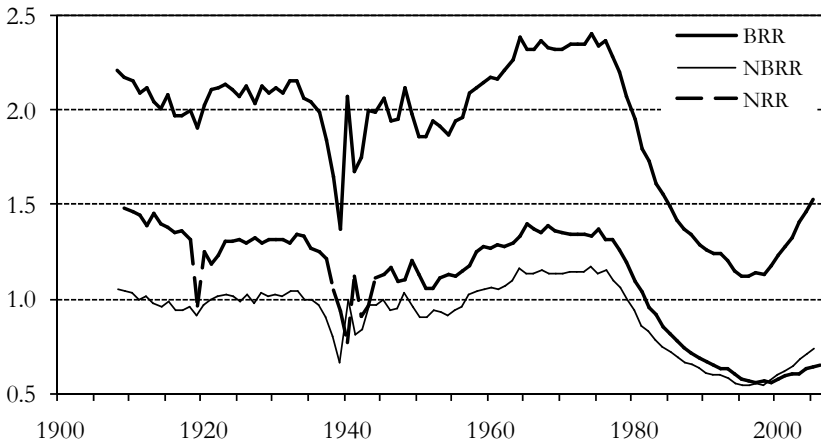
The Net Birth Replacement Ratio until 1940 was lower than the Net Reproduction Rate due to differences between the cohort mortality and period mortality levels as well as the influence of negative migration on the number of women at childbearing ages. The *NBRR* between 1913 and 1920 is lower than 1, which means that births corresponding to the cohorts of mothers were not replaced despite a fertility rate of over 4 children per women, contrary to levels observed for the *TFR* and *NRR*. The explanation lies in the fact that during these years emigration of Spaniards, mainly to America (Sánchez-Alonso, 2000), meant that there was almost a 20 per cent loss of women in childbearing age, as noted in figure 2. The *NBRR* was below the theo-

born between 1860 and 1895. This reduction in the number of women means that a TFR of 3.2 is required in order to replace these cohorts.

retical replacement level during some years in the 1940s and for much of the 1950s when there was a combination of a declining fertility, increasing survival, and variations in migration.

From the 1950s onwards, the differences between *NBRR* and *NRR* are important. The main reasons are the continued mortality decreases – and the consequent changing differences between the cohort and period survival indicators – and the new wave of emigration, in this case to European countries (Puyol, 1979). In the 1980s, as the cohort and period mortality rates became closer as a result of stabilisation at very low mortality levels (Ramiro/Sanz-Gimeno, 2000; Reher/Sanz-Gimeno, 2000) and the reduction in the effect of net migration (Muñoz-Pérez/Izquierdo, 1989; Blanco, 1993; Arango/Martin, 2005), the *NBRR* and *NRR* had similar levels.

In the 1990s, Spain entered into new demographic phase, characterized by massive arrival of population from abroad. The *NRR* and the *TFR* were slightly affected as the majority of foreign women had higher fertility levels than Spanish women (Roig/Castro, 2007). Nevertheless, the slight increase of the *TFR* does not explain the sharp increase in the number of births (figure 3). The increase in births is, in part, due to fertility increases, but more importantly, to the sharp increase in the population of women between ages 15 and 49. The replacement indicators are clearly affected because increases are observed in the *NBRR* and the *NRR*, compared to the 1990s.

By relating the *TFR* and the *NRR* to the *NBRR* in the analysis of the population generation replacement, we observe the interrelated effects of three demographic phenomena on births in Spain. While the TFR shows levels that are clearly higher than replacement levels between 1908 and 1980, the levels are considerably reduced if we include mortality effects on the *NRR*. Nevertheless, when we have incorporated the effects of cohort mortality and migration on the *BRR*, we observe how, even during the first part of the 20th century, the number of births was below the replacement level for many years, mainly because of the international emigration from Spain.

Figure 4:   Spain 1908-2005: Birth Replacement Ratio (BRR) and Birth Replacement Ratio in the absence of migration (BRR^{NoMig})
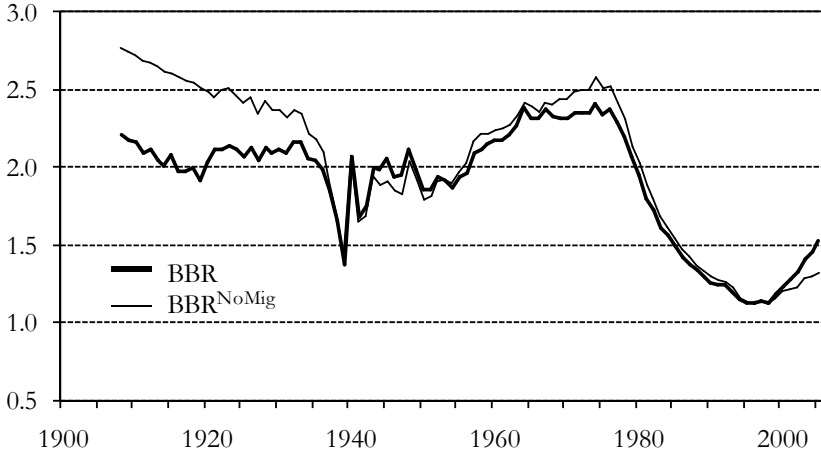
The exact effect of international migration on population replacement losses due to emigration and gains due to immigration are measured by the difference between the observed and expected *BRR* (figure 4). The *BRR^{NoMig}* is below the *BRR* at the beginning of the 20th century during the period of emigration to America. Emigration from Spain reduced births during that period in relation to the births of their mothers to 0.5 children per woman. The Spanish Civil War resulted in the cessation of emigration (Silvestre, 2005) and during the post-war period some Spaniards returned, as reflected in the differences between the observed and expected *BRR*. After 1950, emigration occurred to several European countries, and the *BRR* again was below the *BRR^{NoMig}*. In the 1990s, both indicators were similar with the return of many emigrants (Arango/Martin, 2005) and therefore the influence of migration was negligible. After the mid-1990s, there was an inversion in the relation between the observed and expected replacement indicator as a consequence of the increase in the number of births because of the arrival of large numbers of foreign women in the childbearing ages.

In short, we can observe at a national level how international migration at various stages reduced replacement levels in previous periods and how it now increases replacement levels in Spain.

4.2 The replacement at a regional level between 1908 and 2005: differential impact of internal and international migration in Castile and Leon and Madrid

The different Spanish regions have had similar natural population growth throughout the 20th century. Nevertheless, total population growth rates has been diverse, with some regions having strong population growth and others experiencing sharp population decreases, such as observed in the differences between Madrid and Castile and Leon. While the population in Madrid multiplied almost 8-fold between 1908 and 2005, increasing from 755,000 to over 6 million, the population of Castile and Leon has remained practically unchanged, increasing slightly from 2.3 to 2.5 million.

In the 20th century, Madrid and Castile and Leon have had similar levels of mortality and fertility and yet the number of births for the two regions show different trends (figure 5). This illustrates again the limitation of indicators that do not take migration into account to explain temporal changes in population generation reproduction.

Figure 5:   Total Fertility Rate *(A)* and number of births *(B)* in Castile and Leon and Madrid from 1908 to 2005
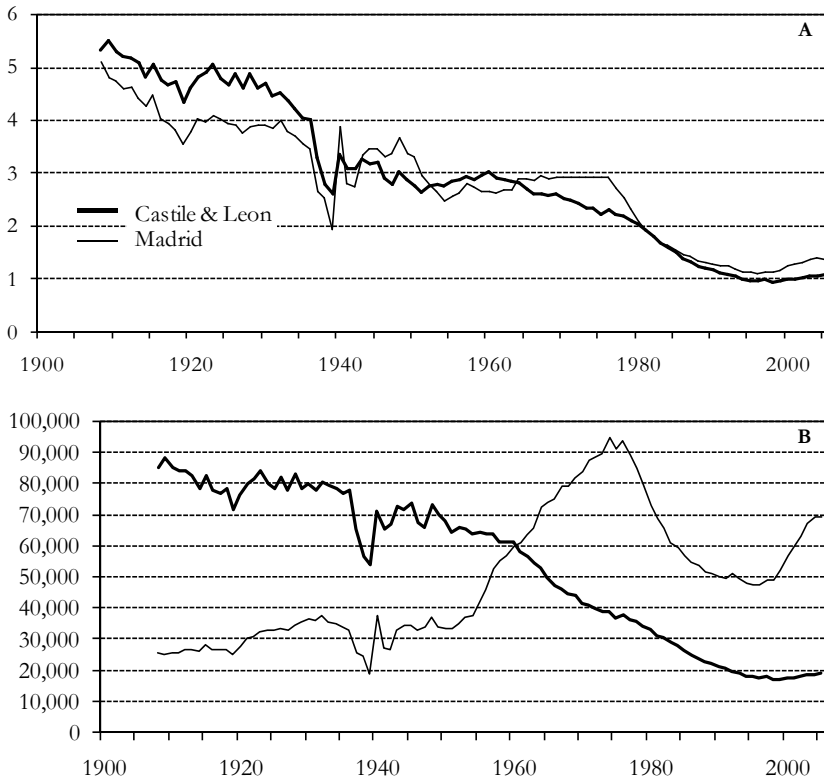
At a regional level in Spain, internal migration has been the most important determinant of demographic dynamics. By observing the net migration factor in the female population between 15 and 49 years (K^{NetMig}), migration can either accentuate or counterbalance ongoing fertility trends in Madrid and Castile and Leon (figure 6). Madrid presents a positive picture for the entire period, and the net migration factor reaches values over 1 in the 1970s, which means that the number of women at childbearing age was double the expected number according to girls born in the past, given mortality conditions. The opposite is true for Castile and Leon, where the emigration of women from Castile and Leon and other regions from the interior of Spain means that there has been a negative net migration factor. Emigration abroad, first to America and later to Europe, and internal emigration explain the

important losses in population size in Castile and Leon. The recent phase in international immigration has led to an increase in the migration effect for Madrid, and for Castile and Leon. Nevertheless, Castile and Leon continue to show a negative migration effect and a loss in population reproduction levels.

Figure 6: Net Migration Factor *(A)* and Birth Replacement Ratios *(B)* 1908-2005: Castile and Leon, Madrid and Spain
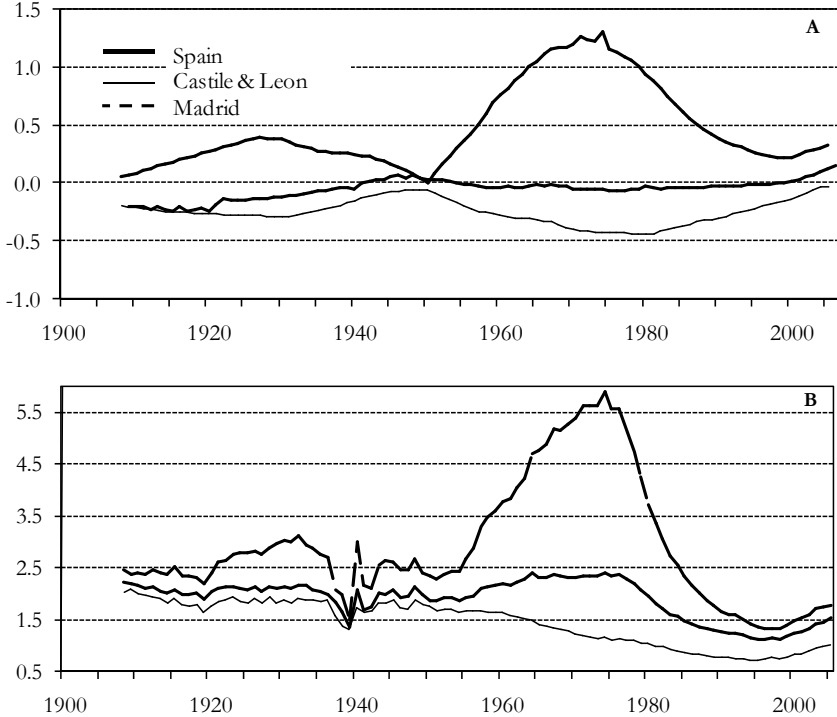
As a consequence of the different migration effects, population replacement levels are considerably different in these two regions. In Castile and Leon, despite total fertility levels being over 2.1 until 1980, the *BRR* was below the theoretical replacement level throughout the 20th century. At the end of the 20th century, it was below 1, which means that there was replacement of less than one-half the previous generation. The opposite is true in Madrid: despite fertility declines, Madrid's *BRR* increased considerably until 1980, far above the theoretical replacement level. In the

1970s, births registered in Madrid almost tripled the number of births corresponding to cohorts of their mothers owing to the important contribution of migration.

By incorporating the effect of migration on fertility to the Equivalent Total Fertility Rate, (i.e., the number of expected mothers every year in the absence of migration in relation to the number of registered births), we observe important regional differences (figure 7): The levels of fertility in Castile and Leon suddenly drop to below 1 in the 1990s, while for Madrid, they sharply increased – particularly in the 1970s. The *ETFR* provides a more nuanced view of the actual population replacement for each region than the *TFR* in relation to the evolution of births.

Figure 7: Equivalent Total Fertility Rate (ETFR) 1908-2005: Castile and Leon, Madrid and Spain
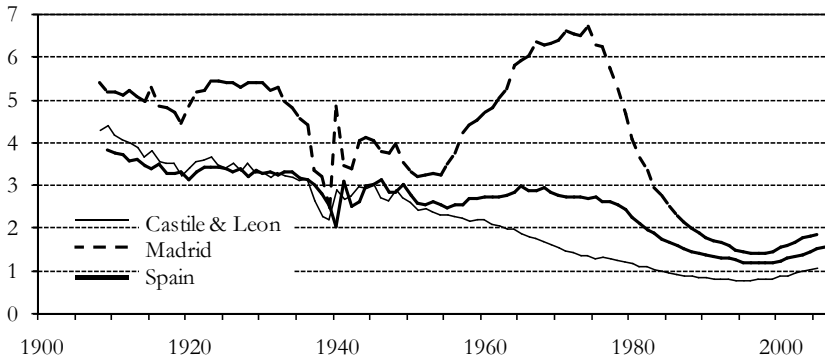
4.3 The replacement at a provincial level 1975-2005: different depopulation and concentration processes

There is a greater diversity in trends for birth replacements and in generational reproduction at a provincial level than at a regional level. With the same mortality levels and similar fertility rates, the evolution of births and population replacement presents great diversity between 1975 and 2005, mainly due to large differences in the effects of migration (internal migration or international migration). We illustrate results for four selected provinces: Zamora, Guadalajara, Almeria and the Vizcaya (see map in the Appendix) that are diverse and represent overall variations found for Spanish provinces.

Zamora shows a replacement level that is typical for provinces in the center of Spain, which are affected by a sharp depopulation processes. Since 1975 the *BRR* has been below 1 (figure 8), which means that annual births since 1975 reduces the

number of mothers at birth by about one-half by the average age of motherhood. The difference between the observed *BRR* (0.74) and the expected *BRR* (1.72) means that more than one-half of the births from women born in Zamora are registered outside the province. In 2001, 58 per cent of women born in Zamora and who are in the childbearing ages were living outside the province, which implies an increase compared to previous censual periods (table 1). Recent international immigration has not greatly influenced the replacement level since it continues to show a negative migration level (figure 9).

Figure 8: Birth Replacement Ratio (BRR) and Birth Replacement Ratio in the absence of migration (BRR^{NoMig}) in selected provinces
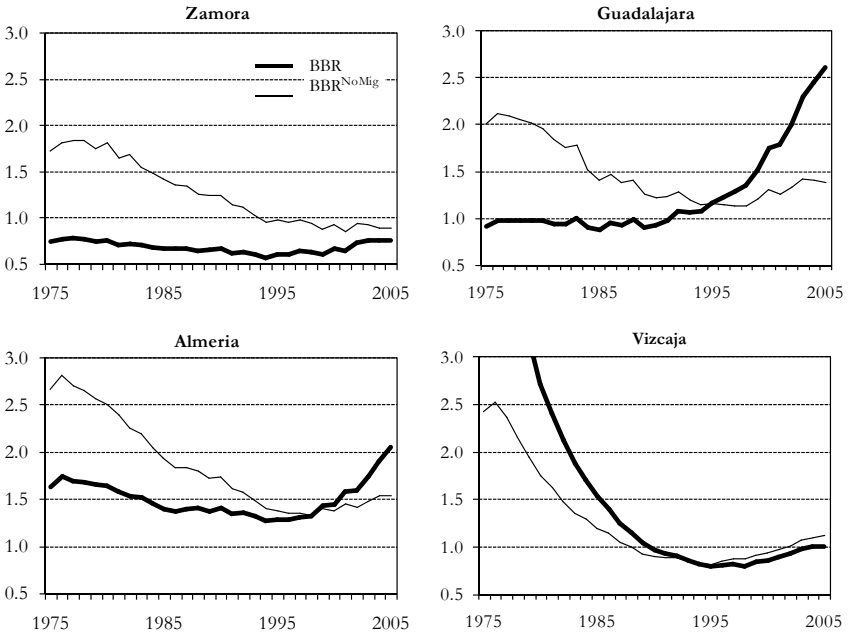
Guadalajara and Almeria show trends that are similar to the majority of Mediterranean provinces, which have shifted from a loss in population reproduction levels in previous periods because of the emigration of women to having a recent surplus. Nevertheless, the causes of these transformations were very different. In Almeria, this change can be explained by a sharp drop in internal emigration (K^{Emig}) and the arrival of foreign population. Foreign women in 2001

114

represented 10 per cent of women at childbearing age and have contributed to the change in the net migration level from - 42 per cent in 1991 to + 9 per cent in 2001 (table 1).

Table 1: Decomposition of the number of mothers (natives, Spanish and foreigners) and migration factors (net migration and emigration) in census years

	G_t	P^{Nat}	P^{Spa}	P^{For}	Total	K^{NetMig}	K^{Emig}
			Almería				
1981	2,727	81	17	1	100	-34	40
1991	3,504	77	20	3	100	-42	59
2001	4,386	70	20	10	100	9	25
			Guadalajara				
1981	857	69	30	1	100	-49	72
1991	1,030	64	34	2	100	-21	74
2001	1,335	48	44	8	100	41	73
			Vizcaya				
1981	8,664	55	44	1	100	49	18
1991	9,194	74	25	2	100	5	13
2001	8,859	84	12	4	100	-8	11
			Zamora				
1981	1,304	87	12	1	100	-58	44
1991	1,345	83	15	2	100	-45	48
2001	1,259	76	19	5	100	-25	58

G_t: Female population at child-bearing ages for each year *t*.
P^{Nat}: % of native women (Nat) .
P^{Spa}: % of internal migrant women (Spa).
P^{For}: % of foreign women (For).
K^{NetMig}: Net migration factor in the female population between 15 and 49 (%).
K^{Emig}: Internal emigration (%).

Guadalajara has been a traditional emigration province that has undergone a sharp depopulation process until recently. For different census years, 1981, 1991 and 2001, the emigration factor was over 70 per cent, i.e., almost 3 out of 4 women born in the province were living outside it during their childbearing ages. Nevertheless, despite long-standing emigration conditions, between 1991 and 2001 Guadalajara changed from a negative migration level of 21 per cent to a positive migration level of 41 per cent, primarily because the metropolitan Madrid population has

spread out to border provinces (such as also the case for Toledo and Segovia). In 2001, 44 per cent of the female population living in Guadalajara were born in other Spanish provinces, mainly in Madrid, and 8 per cent were foreigners (table 1). The result has been that Guadalajara has registered larger increases in the numbers of births (figure 9) and now has the highest provincial population replacement level in Spain.

In the 1970s, Vizcaya had a similar reproductive situation as Madrid, with both areas has positive migration contributions. Nevertheless, contrary to the large majority of Spanish provinces, Vizcaya has developed differently, changing from a province of immigrants to being a province of emigrants. In 1981, the net migration factor was almost 50 per cent, which explains the high replacement level during those years. Internal migrants represented 44 per cent of women living in the provinces at that time. Internal immigration was drastically reduced between 1980 and 1990, while international immigration has made a minor contribution. Overall, the province has had emigration, which explains the negative migration factor in 2001 (table 1). Births registered in 2005 represented only about 40 per cent of births registered in 1975 (figure 9).

These four provinces offer examples of the importance of the migration factor, both internal and international, for the birth replacement process and show the variety of generational population reproductions situations at a sub-national scale. These four examples equally demonstrate the striking differences in the evolution and composition of population replacement in provinces that have similar conditions of fertility and mortality.
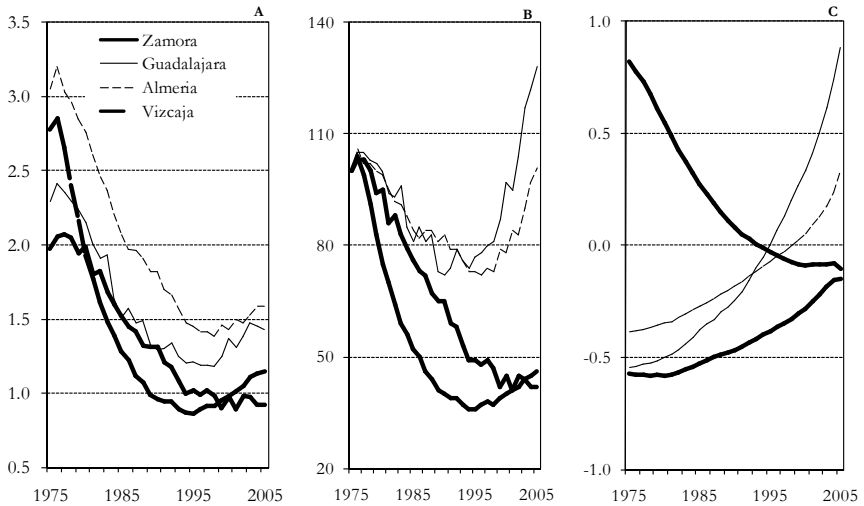
5. Conclusions

The main aim of this paper has been to illustrate the importance of migration on population replacement trends, particularly for populations that have low and stable fertility and mortality levels. By examining Spain and selected regions and provinces, this paper shows the limitations of common demographic indicators that are often used to analyze population replacement and reproduction. The main weakness of the *TFR* and *NRR* is that they do not incorporate migration effects and assume constant rates of fertility. In the case of the *NRR*, it uses the period mortality instead of the cohort mortality. By contrast, the *BRR* is an actual indicator that compares births that occur in a particular year in relation to size of the mothers' generation at birth or "previous generation". It is an indicator that incorporates the three demographic components: fertility, cohort mortality and in particular the impact of migration on births.

In Spain, population replacement in the 20th century has been marked, first, by the remarkable transformation in fertility and mortality and, second, by the effect of international migration. The emigration of women at childbearing ages to America and to several European countries has reduced birth replacement levels. At present,

the arrival of immigrants has increased the number of births and population replacement levels.

In Spain's regions and provinces, there are greatly different replacement levels despite having fairly similar levels of fertility and mortality. Internal and international migration are the differentiating factors in replacement at the regional and provincial level. Internal migration has caused depopulation processes in some regions and provinces and has caused population growth in others. International migration has altered population dynamics in many Spanish regions and provinces, and several areas that previously experienced emigration and now attracting net immigrants. Overall, international migration has reduced the depopulation process in some regions and provinces and has maintained positive population reproduction levels in traditional immigration areas

Acknowledgments

References

Arango, J./ Martin, P. (2005): Best Practices to Manage Migration: Morocco-Spain. In: International Migration Review 39(1), 258-269.

Blanco, C. (1993): The New Hosts: The Case of Spain. In: International Migration Review 27(1), 169-181.

Blanes, A. (2007): La mortalidad en la España del siglo XX .Análisis demográfico y territorial. PhD Dissertation. Departamento de Geografía. Universidad Autónoma de Barcelona. Barcelona.

Calot, G. (1984) : Une notion intéressante: L'effectif moyen des generations soumises au risque. I. Présentation méthodologique. In: Population 39(6), 947-976.

Dopico, F./ Reher, D. (1998): El declive de la mortalidad en España, 1860-1930. Asociación de Demografía Histórica. Zaragoza.

EUROSTAT. Fertility rates by age 1971-2005. Available at http://epp.eurostat.ec.europa.eu).

Festy, P. (1979). La fécondité des pays occidentaux de 1870 a 1970. Paris, Presses Universitaires de France.

Hyrenius, H. (1951): Reproduction and Replacement. In: Population Studies 4, 421-431.

Human Mortality Database (HMD) Life tables: Spain. University of California, Berkeley (USA), and Max Planck Institute for Demographic Research (Germany). Available at www.mortality.org.

INE.Births by year and region, 1925-2005. Spanish National Statistics Institute. Available at www.ine.es.

INE. Fertility rates by ages and region, 1975-2005. Spanish National Statistics Institute. Available at www.ine.es.

INE. Population Census: 1981, 1991 and 2001. Spanish National Statistics Institute. Available at www.ine.es.

INE. Total Fertility Rates by region, 1975-2005. Spanish National Statistics Institute. Available at www.ine.es.

Kohler, H-P./ Billari, F./ Ortega, J.A. (2002): The emergence of Lowest-Low Fertility in Europe during the 1990s. In: Population and Development Review 28(4), 641-680.

Muñoz-Pérez, F./ Izquierdo, A. (1989): L'Éspagne, pays d'inmigration. In: Population 44(2), 257-289.

Ortega, J.A. (2006): Birth Replacement Ratios: New Measures of Period Population Replacement. Fundación de las Cajas de Ahorros, Working Paper 261, 1-32.

Ortega, J.A./ del Rey, A. (2006): Birth Replacement Ratios: 1960-2000. European Population Conference 2006, (21-24 June, Liverpool).

Ortega, J.A./ del Rey, A. (2008): Effects of Internal and International Migration on Birth Replacement: A Regional Analysis in Spain, 1975-2005. 2008 Annual Meeting of Population Association of American, (17-19 April, New Orleans).

Preston, S.H./ Wang, H. (2007): Intrinsic growth rates and net reproduction rates in the presence of migration. In: Population and Development Review 33(4), 657-666.

Puyol, A.R. (1979): Emigración y desigualdades regionales en España. Madrid, EMESA.

Ramiro F.D./ Sanz-Gimeno, A. (2000): Structural changes in childhood mortality in Spain, 1860-1990. In: International Journal of Population Geography 6, 61- 82.

Reher, D.S./ Sanz-Gimeno, A. (2000): Mortality and Economic Development over the Course of Modernization: An Analysis of Short-Run Fluctuations in Spain, 1850-1990. In: Population Studies 54(2), 135-152.

Roig Vila, M./ Castro M:T. (2007): Childbearing Patterns of Foreign Women in a New Immigration Country: The Case of Spain. In: Population-E 62(3), 351-380.

Ryder, N. B. (1997): Migration and Population Replacement. In: Canadian Studies in Population 24(1), 1-26.

Sánchez-Alonso, B. (2000): Those Who Left and Those Who Stayed behind: Explaining Emigration from the Regions of Spain, 1880-1914. In: The Journal of Economic History 60(3), 730-755.

Sardon, J. (1991): Generation replacement in Europe Since 1900. In: Population: an English Selection (3), 15–32.

Silvestre, J. (2005): Internal migrations in Spain, 1877–1930. In: European Review of Economic History 9(2), 233-265.

Appendix

Map of Spain: Selected regions (Castile and Leon and Madrid) and provinces (Zamora, Guadalajara, Almeria and Vizcaya)

Second Generation Mothers - Do the children of immigrants adjust their fertility to host country norms?

Kirk Scott, Maria Stanfors

1. Introduction

For many countries, like the United States, Canada and Australia, immigration has played an important role in the settlement processes. In Sweden, immigration has been a largely post-war phenomenon, but it has nevertheless served as an important input for the transformation of Swedish society and has left an imprint on the composition of the Swedish population that could not be foreseen 50 years ago. From numbering fewer than 100,000 in 1945, the foreign-born[1] population in Sweden had increased to 1.2 million in 2008, and Statistics Sweden projects that this number will reach 1.7 million in the year 2050. Initially, migrants to Sweden were fleeing the horrors and destruction of World War II in Europe, but shortly after the war labor force migration from the neighboring Nordic countries and Southern Europe became the dominant force. In the early 1970s the face of immigration changed and has since been dominated by refugee and family reunification migration from a wide range of countries from all over the world. The widespread demand for manual and industrial labor which was an important determinant of immigration streams in the 1950s and 1960s became less important and, since the early 1970s, migration policy and the outbursts of war, famine and terror on behalf of anti-democratic regimes have largely determined the streams of immigrants to Sweden. This intense and multi-faceted immigration experience resulted in the varied society of today. Not only does Swedish society contain a large immigrant population, but the children of immigrants, also known as the second generation, make up a sizeable and growing fraction of the Swedish population.[2]

With an increasing share of foreign-born residents in Sweden, the issue of immigrant integration has become a pressing social concern. A large body of research has addressed the issue from different angles with somewhat mixed results. On the one hand, evidence suggests that assimilation is occurring in various areas of life, such as education, socioeconomic status, position, and intermarriage. On the other

---

1 In this study, we will use the term 'foreign-born' interchangeably with 'immigrant.'
2 See Bengtsson et al 2005 for a discussion of the Swedish immigration experience.

hand, a number of studies show differences with respect to immigrant experience and nationality and argue that modern day immigrants face challenges that complicate their prospects for assimilation and lead to segmented assimilation among immigrants (cf. Portes/Rumbaut, 1996, 2001; Portes/Zhou, 1993; Zhou, 1997). This segmentation is not only problematic for first-generation immigrants but also for their children, since it may hinder upward mobility for subsequent generations or even lead to downward socioeconomic mobility across generations. While integration and assimilation has been extensively examined for first-generation immigrants, much less attention has been paid to the question of second generation migrants' integration into society, neither in comparison to the integration of their parents' generation nor to native Swedish-born of the same age.

Since we believe that the true story cannot be understood without taking an intergenerational approach, this chapter will take us one step further when it comes to understanding immigrant fertility and assimilation in Sweden by investigating the childbearing behavior of a number of groups of second generation women in relation to otherwise comparable native women with Swedish-born parents during the period 1984-2001. We examine the propensity of childless women to enter motherhood in order to detect differences in patterns between immigrant groups but also between them and the native Swedish-born. We use register-based information on the individual's education and labor market experience together with information on their parents' origin to examine to what extent different economic activities and social experiences affect the transition to parenthood. The results make a contribution to our understanding of demographic effects of integration and indicate in what way nationality and differing immigrant experiences affect fertility behavior.

The paper is organized as follows: after this introduction, we present a brief background in section 2, describing the immigrant experience and immigrant population in Sweden, in order to provide a context for the second generation and their childbearing behavior. Thereafter, we discuss previous research and some theoretical considerations regarding immigrant fertility and, especially, childbearing among second generation immigrants. Section 4 presents data and method, and our results are presented in section 5. Thereafter follows a discussion of the results and a conclusion of the main findings of our study.

2. Background: Swedish context of immigration and immigrant population

This section provides a background of the Swedish context of immigration and a portrait of the immigrant population of first and second generation immigrants in Sweden up until the year 2007. The historical experience of immigration to Sweden is largely a phenomenon of the years following World War II, characterized by postwar migration flows due to war, destruction and disruption. In 1945, the number of

foreign-born in Sweden was less than 100,000. The following decades were, however, characterized by labor migration, largely from Southern Europe. During this period, immigrants could easily establish themselves in Sweden, work and residence permits were readily available, and there was an active recruitment of "guest workers" from countries like Italy, Greece, Turkey, and Yugoslavia, on behalf of many Swedish companies (Bengtsson et al., 2005). Immigrant labor was mainly recruited for manual and industrial work since manufacturing was the engine of growth during the so called "golden years." The Swedish economy was growing more rapidly than its workforce and, although female labor force participation at this time was increasing more in Sweden than for example in Germany, it was not sufficient to meet with the high demand for labor. Lacking other domestic alternatives, immigration was seen as a solution for this bottleneck. To a high degree, the characteristics of the period in question, notably the high demand for industrial labor, affected both immigrant skill composition and outcomes. This situation was to change gradually however. Beginning in the 1960s, the economy began a transformation process through which labor-intensive production was replaced by more capital-intensive procedures, and low-skilled employment began to disappear. While the true impact of this transformation would not be felt in terms of negative effects on immigrant laborers until the 1980s, the government decided, at the urging of trade unions, to limit labor migration in the late 1960s.

As seen in Table 1, the foreign-born population made up 4 per cent of the population in 1960 and its share increased to 6.7 per cent in 1970. In the early 1970s, immigration changed in character since manufacturing-led industrial growth came to a stand-still due to a combination of macroeconomic shocks, such as the oil crisis, and ensuing economic difficulties such as inflation and a general slow-down in productivity. The active recruitment of immigrant labor slowed down in the late 1960s, and in 1972 immigration policy became more restrictive through the establishment of institutional hinders for all except the neighboring Nordic countries[3]. Instead the major inroad became that of humanitarian reasons, and immigration has since then been dominated by refugee migration and family reunification from a wide range of countries from all over the world. In the 1970s, many refugees came from South America whereas, in the 1980s, the Middle East became the dominant sending region. Table 1 indicates how immigration showed a gradual slow-down in the 1970s which continued until 1990. During this phase, both refugees and earlier labor migrants faced increasing difficulties establishing and maintaining footholds in the labor market (e.g. Bevelander/Nielsen, 1999; Scott, 1999).

---

3 Finland, Iceland, Sweden, Denmark and Norway entered into a common labor market in 1954, and migration between the countries has been relatively unrestricted since then.

Table 1: Summary population statistics for various years

	1960	1970	1975	1980	1985	1990	1995	2001
Population per December 31	7,497,967	8,081,229	8,208,442	8,317,937	8,358,139	8,590,630	8,837,496	8,909,128
Men	3,757,848	4,045,318	4,127,179	4,119,822	4,127,110	4,244,017	4,366,071	4,408,445
Women	3,740,119	4,035,911	4,081,263	4,198,115	4,231,029	4,346,613	4,471,425	4,500,683
Persons age 0-17	2,046,306	2,007,012	2,012,638	1,977,226	1,844,497	1,880,316	1,967,138	1,938,266
Percentage of total population	27.3	24.8	24.5	23.8	22.1	21.9	22.3	21.8
Persons age 65+	887,964	1,113,239	1,250,785	1,362,099	1,454,111	1,526,196	1,543,332	1,532,064
Percentage of total population	11.8	13.8	15.2	16.4	17.4	17.8	17.5	17.2
Non-Swedish citizens	190,621	411,280	409,894	421,667	388,641	483,704	531,797	475,986
Percentage of total population	2.5	5.1	5.0	5.1	4.6	5.6	6.0	5.3
Foreign-born	299,879	537,585	550,451	626,953	655,649	790,445	936,022	1,027,974
Percentage of total population	4.0	6.7	6.7	7.5	7.8	9.2	10.6	11.5
Swedish-born with two for-								
Persons of foreign descent							224,494	294,493
							13.1	14.8
Births	102,219	110,150	103,632	97,064	98,463	123,938	103,422	91,466
Crude birth rate (per 1,000)	13.7	13.7	12.6	11.7	11.8	14.5	11.7	10.3
Total fertility rate	2.13	1.94	1.78	1.68	1.73	2.14	1.74	1.57
Immigration	26,143	77,326	44,133	39,426	33,127	60,048	45,887	60,795
Immigrants (per 1,000)	3.5	9.6	5.4	4.7	4.0	7.0	5.2	6.8
Emigration	15,138	28,635	27,249	29,839	22,036	25,196	33,984	32,141
Emigrants (per 1,000)	2.0	3.6	3.3	3.6	2.6	2.9	3.9	3.6
Population increase	35,827	76,872	31,751	14,927	15,518	63,594	21,115	26,336
Population increase (per 1,000)	4.8	9.5	3.9	1.8	1.9	7.4	2.4	3.0
Persons who gained Swedish	8,452	11,539	16,705	20,833	20,498	16,770	31,993	36,399

1) This category includes both foreign-born and Swedish-born with two foreign-born parents.

Source: Statistics Sweden.

This situation was further exacerbated by the economic downturn in 1991 that, over the following years, developed into a severe economic crisis with high unemployment and slow economic growth rates throughout the Swedish economy. In the early 1990s, the wars in former Yugoslavia and the Middle East dramatically affect-ted international migration flows. In Sweden, the flow of immigrants increased to about 10 immigrants per 1,000 population, and the share of foreign-born came to exceed 10 per cent of the total population. In many ways, this intense and multifaceted immigration experience resulted in the culturally and ethnically varied society of today.[4] Although the economy recovered in the late 1990s, the labor market situation for immigrants in today's Sweden is, however, one often characterized by high unemployment levels, lower relative incomes, higher rates of absenteeism, and high rates of early retirement, especially in the areas in which there is a clustering of immigrants (see e.g. Ekberg, 1999; Rooth, 1999). The reasons considered for this include a mismatch between immigrants' human capital and the needs of employers, discrimination, and structural changes in the Swedish economy and labor market.

In addition, during recent decades the group of so-called second generation immigrants, that is children born in Sweden with at least one parent born abroad, has been growing. In 2007, 6.7 per cent of the population was born in Sweden with at least one foreign-born parent and almost 4 per cent were Swedish-born with two foreign-born parents. In total this growing group makes up 975,516 individuals of whom 364,606 have two foreign-born parents (Statistics Sweden). The children of immigrants have received little attention until recently and this implies a lack of insight on a sizeable share of the population. The primary reason for this is that they are rather young in their age composition so it has been difficult to properly investigate this heterogeneous group with respect to education, labor market careers, and patterns of family formation.[5] When it comes to demographic composition, the second generation is clearly shaped by immigration history – by variations in the ethnic composition and magnitude of influx of immigrants together with the demographic behavior of different immigrant groups (typically fertility and return migration). Those few studies which have been undertaken focus, to a large extent, on the educational and labor market performance of the second generation. Their results show that the second generation performs better than their parents, but are not quite on par with native Swedish-born with two native-born parents (see e.g. Ekberg, 1997; Hammarstedt, 2002, Hammarstedt/Ekberg, 2002; Rooth/Ekberg,

---

4 It should be noted that there exists considerable heterogeneity among the immigrant population that makes comparisons difficult at an aggregate level. Therefore, in the analysis below, we focus on and discuss individual-level characteristics, in which ethnicity and immigrant experience are important aspects.
5 On average, the second generation of immigrants is considerably younger than the first generation which is in turn younger than the native-born Swedish population.

2003, Österberg, 2000). There are, however, findings that emphasize the role of ethnic background in that having a non-European background, and to some extent also a Southern European background, is correlated with a higher probability of unemployment and lower earnings compared to native Swedish-born (Månsssson/ Ekberg, 2000; Vilhelmsson, 2002). The existing studies show that second generation immigrants born before 1970 seem to have a better labor market position than those born after 1970, but this may be explained by the different compositions regarding nationality background. Moreover, Rooth and Ekberg (2003), for example, find a pattern of low intergenerational economic mobility among some ethnic groups – a finding that points towards the importance of Swedish-specific human capital for successful labor market integration. This argument is further strengthened by the finding that second generation immigrants with one native Swedish-born parent do better than otherwise comparable second generation immigrants with two foreign-born parents. In this study, we extend on previous studies and investigate how economic activities affect the transition into parenthood for different groups of second generation immigrant women, and whether this is different if one of the parents is Swedish-born compared to if both parents are foreign-born.

3. Previous research and theoretical considerations

Fertility of immigrants

Fertility analysis is an important component of the study of the integration of immigrants into their host society (Massey, 1981). From a demographic point of view, a better knowledge of the childbearing behavior of different groups may serve as an important input for population projections. The higher fertility among recently arrived immigrants may support population growth, at least in the short run. In the long run, differential fertility patterns will have impact on the composition and age structure of the future population.

The fertility patterns of immigrants is a topic that is now extensively covered in a very rich literature (see e.g. Abbasi-Shavazi/McDonald, 2000 on Australia; Andersson, 2004; Andersson/Scott, 2005, 2007, on Sweden; Bean et al., 2000; Blau, 1992; Fischer/Marcum, 1984; Ford, 1990; Forste/Tienda, 1996; Glusker, 2003; Lindstrom/Saucedo, 2002; Ng/Nault, 1997; Stephen/Bean, 1992 on North America, notably the United States). The core issue in all of these studies has been whether immigrants adapt to life in their new country and the mechanisms through which this adaptation may occur. Related to this issue is in what way duration of residence in a new country is associated with assimilation and what the determinants of fertility are among different ethnic groups.

In the case of Sweden today, the childbearing patterns of women born in the Nordic and EU countries are very similar to that of Swedish-born women. The variation between different nationalities is little. Obviously, there is not only adaptation to Swedish childbearing norms, but a gradual assimilation process going on, indicated by the fact that the youngest cohort is the most similar to Swedish-born women when it comes to the propensity to have a child. Immigrant women born outside of Europe have higher fertility than the Swedish-born and women coming from less developed countries have the highest fertility. Change is occurring, although not equally among all nationalities, depending on the country if origin. Women from more developed countries are adapting somewhat more and quicker than women from less developed countries, who deviate the most from the childbearing pattern of the Swedish-born. Duration of residence in Sweden is associated with assimilation, and the propensity to have a child, irrespective of parity, is clearly higher among those who have arrived recently, especially from less developed countries from which many refugees come. The general picture is, however, an adaptation among immigrant women to the fertility pattern of the Swedish-born. When it comes to the determinants of fertility among different ethnic groups, Andersson (2004) shows that period trends in childbearing during the last decades have been quite similar for immigrant and Swedish-born women in a way that suggests that both groups have been affected quite similarly by changes in economic and social factors that together make up the general climate of childbearing. In a thorough study of labor market status and economic independence, Andersson and Scott (2005) find further support for this in that the effects of earned income, various forms of participation and non-participation in the labor market do not vary much between immigrants and the Swedish-born. The similarity in patterns across national groups supports the notion that various institutional factors affecting all subgroups of society are crucial in influencing childbearing behavior.

Childbearing among the second generation

Despite the active research on the fertility of immigrants, the fertility behavior of second generation immigrants has received much less attention. Quite recently attention has been paid to intergenerational trends in fertility among immigrant groups in North America, notably among Hispanics and Mexicans in the US (Bean et al., 2000; Bélanger/Gilbert, 2002; Blau/Kahn, 2007; Blau et al., 2008; Frank/Heuveline, 2005; Parrado/Morgan, 2008). One line of argument is intergenerational

assimilation (e.g. Bélanger/Gilbert, 2003; Blau/Kahn, 2007)[6] but another argument and area of concern is the fact that, unlike the case of European immigrants a hundred years ago, certain groups like Hispanics and Mexicans seem to retain high fertility levels instead of experiencing rapid intergenerational fertility decline (cf. Morgan et al., 1994; Rosenwaike, 1973). In the study of the experiences and fertility behavior of the second generation, we need to bear in mind how things have changed over time. Parrado and Morgan (2008) extend on previous research in an analysis that aims at determining whether Hispanic fertility levels are approximating those of non-Hispanic whites over time and across generations by actually comparing immigrant women with their daughters' and granddaughters' cohorts over time.[7] Overall, their analysis indicates converging fertility patterns. To our knowledge, there have to date been very few studies concerning the second generation of immigrants in Sweden and no previous studies on second generation immigrant fertility in Sweden due to the simple fact that immigration is a fairly recent phenomenon. With the large waves of immigrants not arriving until the 1960s, it is only recently that second generation immigrants have reached the age where studies of labor market assimilation and entry into parenthood can be carried out.

Immigrant integration and fertility

There is no doubt that changes in fertility behavior are important aspects of the integration process of immigrants. Most studies of the relationship between immigration, integration and fertility apply theoretical frameworks stressing separation, assimilation, adaptation, selectivity and/or diffusion. A general impression is that these theoretical approaches are not mutually exclusive, but rather are complementary.

Migration is often a stressful process and if it leads to the (temporary) separation of couples, there may be a negative effect on fertility among immigrants (Bongaarts/Potter, 1979; Goldstein/Goldstein, 1983; Menken, 1979; Stephen/Bean, 1992), but this effect seems to be limited, however (Lindstrom/Saucedo, 2002). Immigrant fertility may also be lower in the destination country than in the country of origin due to assimilation/adaptation or the process of immigrant selection.

Immigrants may both assimilate to the cultural norms of the host country (Andersson, 2004; Chiswick, 1978; Rindfuss, 1976; Rumbaut, 1997) and adapt to new behaviors and goals when the advantages of small families become obvious

---

6 Some of the results indicating assimilation across generations should, however, be interpreted with caution since the data often consist of census material so many of the immigrants studied were not likely to be actual parents of the second generation.
7 This analysis produces substantially different findings from those of cross-sectional analyses.

(Blau, 1992; Ford, 1990; Lindstrom/Saucedo, 2002). Assimilation is thought to take time and become stronger across generations (Alba/Nee, 2003; Bean et al., 2000; Ford, 1990; Kahn, 1994; Lindstrom/Saucedo, 2002; Rosenwaike, 1973). Assimilation can proceed unevenly across different dimensions, with assimilation in one dimension not necessarily guaranteeing assimilation in others. For example, a group can achieve socioeconomic success (i. e. structural assimilation) but live segregated from the majority and not assimilate culturally (i.e. cultural assimilation or acculturation) and likewise, a group can acculturate successfully but not yet fully integrate socioeconomically. Although the outcome of assimilation and adaptation is the same, the underlying processes are different, with assimilation being more determined by the social and cultural context in the destination country while adaptation is more a response to economic opportunities and the relative costs of children and childrearing.

Immigrant selection is also important since migration is not a random process and there may therefore be systematic differentials between migrants and non-migrants that account for fertility differentials between the two groups. Selection may work through education, occupation, or marital status but also through unobserved characteristics such as ability, aspirations and open-mindedness, and lead to fertility preferences different from those held by the population of origin, and therefore result in lower fertility among emigrants than among non-migrants who remain in the country of origin (Blau, 1992; Goldstein/Goldstein, 1983; Kahn, 1988). When it comes to diffusion, cultural theories stress factors that shape and transmit values through different learning processes, quite similar to assimilation. Lindstrom and Saucedo (2002) presents an example of how diffusion may affect fertility both among migrants, return migrants, and non-migrants. Diffusion may also be of importance for the fertility of immigrants depending on what kind of communities they reside in and relate to (cf. Portes/Rumbaut, 1996) and on what kind of gender composition and gender values that prevail.[8]

Immigration and fertility research is often focused on the experiences of adult immigrants who are assimilating and adapting to the destination country. There is much less research on the fertility of second generation immigrants despite the fact that assimilation is a long process which changes immigrants and their situation over generations (e.g. Bean et al. 1984; Lindstrom/Saucedo, 2002; Rosenwaike, 1973). Assimilation, especially that of the children of immigrants, is often seen as a straight-line process but, increasingly, the second generation, both in Europe and the United States follow the more diverse pattern of segmented assimilation not least since the socioeconomic context that immigrants face has changed dramati-

---

8 This is consistent with assumptions concerning the role of women's social networks in fertility decline as well as in the diffusion and adoption of contraceptive practices (see Rutenberg/Watkins, 1997; Watkins/Danzi, 1995).

cally over the last decades (Gans, 1992; Portes, 1995; Portes/Rumbaut, 1996; Zhou, 1997; Waldinger/Feliciano, 2004). With segmented assimilation, children of immigrants may adopt the host country's behavior, language and norms, but nevertheless find themselves identified with belonging to a minority, and assimilate into society and the economy but retain a strong attachment to the group of origin (Portes, 1995). In situations in which immigrants come from cultural and ethnic backgrounds that differ greatly from that of the host country, the second generation is more likely to fall into the patterns of segmented assimilation. Similar to what Boyd and Grieco (1998) found for Canada, children of immigrants who are visible minorities may be more likely to experience segmented assimilation rather than direct assimilation in Sweden today, but this process may be mediated by parental composition if one parent is Swedish-born (cf. Rooth/Ekberg, 2003).

Hypotheses

Drawing on previous research and different theoretical frameworks relevant to the integration of immigrants in the existing literature, we address three main questions when it comes to the childbearing behavior of childless second generation immigrant women in relation to otherwise comparable native Swedish-born: How important is nationality background for the transition into parenthood? What role does labor market attachment play for the probability of becoming a mother? And, how important is it to have one native-born parent for the propensity to have a child, all else equal?

According to different theoretical aspects of integration, it is expected that the longer immigrants reside in the host country, the more they will resemble the native-born population. It is also expected that immigrants from countries and cultural settings close to/not very different from the host country will integrate and assimilate more easily than immigrants from other settings (Alba/Nee, 1997). This goes for labor market integration as well as for assimilation to ideals such as childbearing norms. Since all of the second generation is born and raised in Sweden, time in country is not of importance. It may nevertheless be interesting to bear in mind that the nationality background may serve as an indicator of how long the parents have resided in the country, for what causes they immigrated, and how large the socio-cultural distance between source and destination country is. We therefore expect second generation immigrants with parents from the Nordic countries to be more like the native Swedish-born, when it comes to the transition to parenthood, than are those with parents from other countries.

Previous research has found that the probability of having a child (both first and higher parity) is higher in Sweden if the mother has an attachment to the labor market than if she is a student/unemployed or non-participant (Andersson/Scott,

2005, 2007). This is very similar irrespective of nationality background. Several studies have repeatedly found compatibility between female labor force participation and parenthood in Sweden. Contrary to what is predicted by the New Home Economics literature (see e.g. Becker, 1981), childbearing and female labor market participation are not competing activities in the Nordic family policy model. On the contrary, labor market attachment is to a high degree a precondition for family formation. With universal public sector programs, all gender differences in public aid and benefits have been removed. The parental leave scheme, introduced in 1974, has benefits allotted in proportion to foregone earnings. Thus, in line with the rest of the social insurance system, there are strong incentives for both women and men to work before the birth of the first child. An extensive institutional framework and a comprehensive family policy has therefore made it possible for women to combine work and family and it has also changed the impact of female labor force participation on childbearing from being a hindrance to almost becoming a prerequisite (Stanfors, 2003). Similar developments have also taken place in other developed countries, although some disagreement remains concerning how large this change has been (e.g. Billari/Kohler, 2004; Brewster/Rindfuss, 2000; Engelhardt et al., 2004).

In line with this, we expect second generation women with previous labor market attachment to have higher probabilities of becoming a first-time mother than women with other socioeconomic statuses, especially those being a student since education is highly incompatible with childbearing and child rearing. A qualifying comment might be in place, however: The fertility of second generation immigrant women should be quite similar to that of native Swedish-born women, but, according to the segmented integration perspective, it should differ between groups, depending on their nationality background and their parental immigrant experience. In the case of some nationalities, the impact of cultural norms related to gender and family roles could produce more conservative patterns of fertility behavior, for example channeling women from the labor market into more family oriented activities. It may also be that women, in a situation when they have problems establishing themselves in the labor market due to discrimination or other reasons, may turn to family formation as an alternative "career" path. But, according to the success-oriented perspective emphasizing integration and assimilation, the children of immigrants, pushed by the success orientation of their family, may be more motivated than others, for example native Swedish-born, to invest in their human capital and to have higher aspirations with respect to their participation in education and the labor market than others. In particular, this would be reflected by a stronger tendency to pursue education for a prolonged period. The prolongation of education and early career investment often leads to the postponement of fertility. Thus, the fertility of the second generation may be even more postponed and, possibly result in lower fertility than that of the native Swedish-born group.

Although it is not within the scope of this study to analyze intergenerational transmission of fertility (cf. Blau et al., 2008), we recognize the potential importance of the parental generation – their experiences and nationality background. It is a well-established fact that demographic behavior as well as family values and family size preferences are, to a large degree, transmitted from the parental generation. We expect parent composition to matter in the sense that a Swedish-born parent may have a mediating effect and lead to an assimilation to native Swedish behavior. Thus, we expect individuals that have one native Swedish-born parent to be more similar to the all-native Swedish-born group when it comes to fertility behavior.

4. Data and method

Data

In the empirical analysis, this study examines second generation fertility through the use of a longitudinal data set constructed from register data maintained by Statistics Sweden. The Swedish Longitudinal Immigrant database (SLI) contains detailed economic and demographic data from other official registers on approximately 550,000 individuals in Sweden.[9] The individuals in the database are sampled by country of birth on arrival in Sweden, and we will analyze individuals from 12 of the largest migrant sending countries, with a sample of native Swedish-born used as a control group. The SLI contains individual data, but each individual is linked to surviving parents and children, and as such it is possible to construct multi-generational datasets which enable us to investigate the fertility patterns of women with at least one foreign-born parent, and compare the patterns to those Swedish-born individuals with two Swedish-born parents.

As mentioned, this study defines the second generation as individuals born in Sweden having at least one parent born abroad. We identify whether one or both parents were foreign-born and from what country they come, and then categorize the individuals according to parental place of birth. The categories are of a regional character: the areas from which most labor migrants came, i.e. the Nordic countries, traditional labor-export countries, Eastern Europe, and Germany/USA. To a large extent, the grouping of countries also reflects the different immigrant experiences of the parental first-generation immigrants. Any individual with at least one parent of foreign extraction in our database is defined as being second generation, regardless of the gender of the foreign parent. Individuals with only one foreign-born

---

9 The Swedish Longitudinal Immigrant database (SLI) has been constructed in cooperation between Statistics Sweden, the Swedish Migration Board, and the Department of Economic History at Lund University.

parent are categorized according to the nationality background of that parent. For those with two foreign-born parents coming from different countries, the nationality background of the mother is used to determine the child's background, however we also control for mixed parental origin in our regressions.

The database covers the time period 1968-2001, but we choose to only examine the period from 1984 onwards, since detailed information on many public transfers is lacking in the earlier period. Given that the second generation tends to be quite young, this limitation is of little practical importance, since the women were almost universally too young to have children prior to 1984.

As the topic of interest in this paper is first births, we restrict the sample to childless women in the ages 15-45. We investigate the fertility patterns of women with at least one foreign-born parent, and compare the patterns to those of Swedish-born individuals with two Swedish-born parents. We control for a number of factors that may be of importance for the transition to parenthood. While partner information is one factor certainly of importance to any study of fertility, we are not able to control for this due partly to the construction of the Swedish registers and partly to the Swedish tradition of cohabitation that is not registered. These problems are interrelated, since a large share of the population is cohabiting at the time of the first child, and cohabiting couples are only identified in the registers in cases where they have a common child. Thus a coupled approach to the study of fertility is possible for higher birth orders, but not possible for studies of entry into parenthood.

Our demographic data have been merged with information of registered income of various sources of each woman. In addition to information on earned income we also have data on income in the form of sickness benefits, unemployment benefits, and income derived from transfers related to studies, and social welfare. All income is standardized and expressed in terms of 'base amounts', which are essentially price-indexed values used by the Swedish government for the calculation of social welfare benefits and transfers.[10] We use information on various income sources in order to indicate the woman's labor market attachment, whether she is working, unemployed, a student, on welfare, or simply non-participating, and how that affects the propensity to become a first-time mother. We also control for income level.

---

10   In 2009, one base amount was equal to SEK 42,800.

Table 2a: Descriptive statistics of childless women in sample, second generation immigrants, by origin and first births, 1984–2001

Nationality/region	Births	Obs	N	Employed (%)	Student (%)	Welfare recipient (%)	Unemployed (%)	Non-participant (%)	Pension (%)
Sweden	2,753	58,500	7,646	34.0	44.0	5.0	13.0	2.0	3.0
Nordic	2,145	39,627	5,372	33.0	37.0	9.0	14.0	2.0	4.0
Eastern Europe	338	11,003	1,596	19.0	58.0	9.0	8.0	2.0	4.0
Labor migration	1,538	39,798	5,744	19.0	53.0	9.0	10.0	5.0	3.0
Germany/USA	638	15,529	1,867	32.0	44.0	5.0	11.0	5.0	4.0
Total	7,412	164,457	22,225						

Source: The Swedish Longitudinal Immigrant database (SLI).

Table 2b: continued

Nationality/region	Mean age at first birth	Mean age at first birth 1985–90	Mean age at first birth 1991–95	Mean age at first birth 1996–2001
Sweden	26.36	25.69	26.08	27.07
Nordic	25.58	24.51	25.66	26.50
Eastern Europe	23.90	23.62	23.60	24.17
Labor migration	23.95	22.21	23.68	24.70
Germany/USA	26.65	25.07	26.49	28.09
Total				

Source: The Swedish Longitudinal Immigrant database (SLI).

Tables 2a and 2b show descriptive statistics of the sample population by origin and first birth during the period 1984-2001. The most common economic activity to be involved in one year before the birth of the first child is either employment or education. As anticipated above, due to the design of the Swedish social insurance system, very few women are unemployed, on welfare, or otherwise non-participants in the labor market, irrespective of nationality background. Some differentials, although in some cases very small, are obvious. Swedish and Nordic women, together with women with German or American parents, are employed to a higher extent when becoming mothers.

Figure 1:   Kaplan-Meier survivor curves representing share childless at ages 15-45
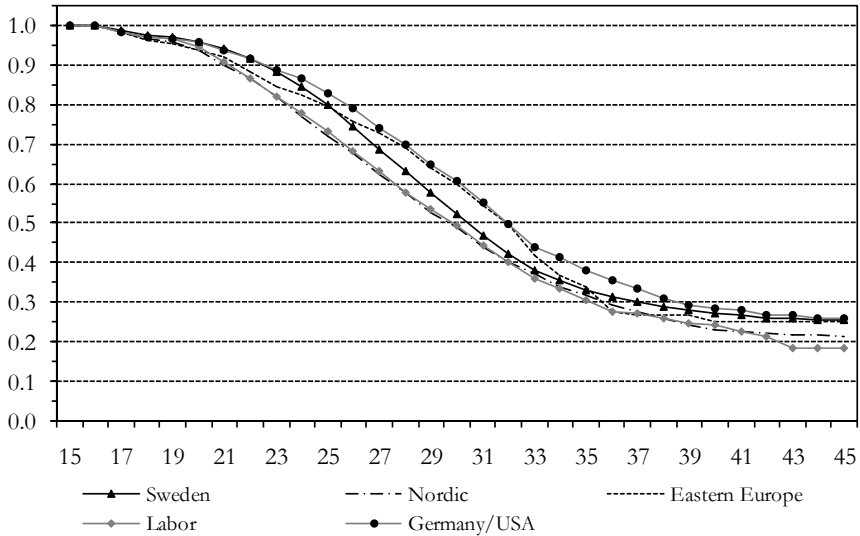
Figure 1 shows the Kaplan-Meier estimates of the proportion childless by nationality background. The first thing to note is the earlier age at first birth among women with Nordic and labor migrant backgrounds (i.e. those with parents who came mainly as labor migrants) in comparison with other groups of women. The postponement of first births is more obvious among women with Swedish-born parents and most distinct among women with Eastern and German/US nationality background. Overall these groups, however, follow the same general pattern. It seems, however, as women with German/US nationality background started childbearing somewhat earlier than women with Eastern European nationality background as

well as Swedish women. The mean age at first birth was nevertheless highest among women with German or US background (26.65). There is quite a spread between different nationality backgrounds and from table 2b it is also obvious that there is a gradual increase in the mean age at first birth for all groups of women, although women with Eastern European background do not show as accentuated an increase as the other groups.

Method

We study the transition to parenthood by focusing on the time to conception leading to a first birth. This is defined as the actual time of the birth. All explanatory variables (only available on a yearly basis) are, however, lagged with one calendar year. One alternative is to define it as the time of birth minus nine months, i.e. conception. One reason for using conception rather than birth is that this is closer in time to the actual decision to have a child, and thus the values of the covariates will better reflect the conditions governing the decision.[11] We modeled both alternatives and they yielded highly similar results.

We present hazard rates of having a first child for different categories of childless women ages 15-45 living in Sweden. In order to calculate these rates, we estimate the impact of three different types of covariates on the risk of having a first birth: time-invariant (e.g., nationality background, and parental composition), time varying (e.g., income and labour market status) and aggregate, or external, covariates (local economic conditions). We estimate our models using a piecewise-constant hazard regression, which is essentially an exponential hazard regression where the baseline is allowed to vary within pre-defined time-segments. This method enables us to estimate piecewise constant hazard rates and compare baselines between second generation immigrant women with different nationality backgrounds with that of native Swedish-born women.[12]

The variables included are nationality background, parental composition, local labour market conditions, disposable income, labour market attachment, and level of education. A couple of explanatory comments on the variables may be in place.

---

11   For example, the labor force participation of women is likely to decline in many cases before the actual birth of the child, which will affect the estimated effects of this variable on the transition to parenthood. However, since we make use of lagged variables indicating the state of for example labor market attachment one year before childbirth this is not a problem yielding bias in our estimations.

12   Since we deal with first births only, and since the individuals were randomly selected, there is no problem of multiple events for the same individual or unobserved relationships between the individuals in the sample (for example family relationships), and therefore there is no need to use a frailty model.

Nationality background (time invariant) indicates different aspects of the individual's immigration experiences and cultural proximity to Sweden and Swedish norms regarding family formation. The variable is grouped into categories for the sake of attaining large enough groups to allow for statistical analysis. Robustness checks show that the groups in each category are sufficiently similar to avoid serious bias caused by inappropriate grouping. The groups are Swedish, Nordic (Finland, Denmark, Norway), Eastern European (Poland, Czech Republic, Slovakia), Germany and the United States, and Labour Migration (Turkey, Former Yugoslavia, Italy, Greece). Children of non-European migrants have been excluded from this study since they are still too young. For those cases where individuals have two foreign-born parents of different nationalities, the nationality of the mother is used to determine ethnic background.

Parental composition (time invariant) refers to the ethnic origin of the parents. This is based upon actual country of birth, and not the national groupings, and is converted into four categories. Same nationality refers to both parents coming from the same country, mixed nationality implies that both parents are immigrants, but from different countries, and those children with one foreign parent and one Swedish parent are denoted as having a Swedish mother or a Swedish father.

Local labour market conditions are proxied by the average municipal unemployment rate during the previous year. The volatile ups and downs of Swedish fertility rates are unique in international comparison and closely connected to economic performance, both on an individual level (notably for women) and on a national level with a close connection between business cycle variation and fertility (Stanfors, 2003).

Disposable income (time varying) is the recorded annual disposable income during the previous year. This income is recorded as a price indexed 'base amount' which allows for comparability over time. The variable is also included in its quadratic and cubic forms to allow for a very flexible non-linear effect.

Labour market attachment (time varying) is measured during the year prior to observation and is derived from the income records and the categories are here mutually exclusive and exhaustive, although some individuals may combine different kinds of economic activities over the year. The categories are enrolled student, unemployed, welfare recipient, employed, and being a non-participant, i.e. not falling into any of the previously mentioned categories. For those individuals who combine several of these statuses, the category is determined by the status which provided the most income during the previous year.

Education (time varying) indicates the highest educational degree attained and is divided into three different categories: primary, secondary (both theoretical and vocational high school programs), and university. Given mandatory school attendance in Sweden these three categories are mutually exclusive and exhaustive.

5. Results

Table 3 displays the piecewise constant regression estimates (hazard rates) of the likelihood of having a first birth for childless women aged 15-45 in our sample.[13] The results are presented as a pooled regression including all women, and also as country-group specific event-history models. We define our baseline as age, with the pieces constant within three-year intervals.

In addition to the Kaplan-Meier survival plots (Figure 1) for groups with different nationality background, our estimates of the time-pieces in the baseline hazard show us the probability for a woman in a particular age-bracket to have a first birth, given values of zero for all control variables – the hazard ratios should be interpreted in terms of the absolute risk or probability to have a first birth by age for a woman belonging to the reference category with respect to all covariates (e.g. employed, with secondary education, both parents of same nationality). The hazard rates in Table 3, which are graphically displayed in Figure 2, show that the absolute risk of having a first birth is bell-shaped for all women with a concentration of births in the age span 24-36, with a peak in the age span 30-33 years. Looking at this age-pattern with respect to nationality background, we find that this is a typically Swedish pattern also followed by women with a Nordic background and women of German and US descent. Women with an Eastern European background concentrate their first births to ages 33-36 whereas women with a Southern European/Labor migration background follow a more wave-like pattern with increased absolute risk of first births in the early thirties but also at higher ages.

---

13   We have also run regressions for childless women aged 15-30. The results were all highly similar but in cases that there are differences between early childbearing and the rest, they are reported in this results section.

Table 3: Results of piecewise constant exponential hazard model of impacts of individual and labor market characteristics on probability of having a first child, childless women aged 15-45, 1984-2001

	Pooled	Nordic	Eastern Europe	Labor	Western Europe	Swedish
Age – Baseline						
15 - 17	0.031**	0.038**	0.020**	0.031**	0.031**	0.030**
18 - 20	0.034**	0.049**	0.025**	0.044**	0.016**	0.025**
21 - 23	0.068**	0.081**	0.072**	0.097**	0.027**	0.057**
24 - 26	0.099**	0.102**	0.080**	0.132**	0.043**	0.101**
27 - 29	0.116**	0.111**	0.110**	0.153**	0.048**	0.124**
30 - 32	0.144**	0.121**	0.201**	0.196**	0.072**	0.156**
33 - 35	0.103**	0.104**	0.253**	0.150**	0.045**	0.098**
36 - 38	0.067**	0.075**	0.022**	0.065**	0.040**	0.062**
39 - 41	0.037**	0.041**	0.031**	0.088**	0.019**	0.032**
42 - 44	0.013**	0.015**	0.000	0.106*	0.006**	0.011**
45	0.010**	0.025	0.000	0.000	0.000	0.007**
Immigrant Background						
Swedish	ref. cat.					
Nordic	1.119**					
Eastern Europe	0.924					
Labor Migrant	1.100**					
Germany/USA	0.896*					
Parental Origin						
Both Same	ref. cat.					
Swedish Mother	0.927*	0.961	0.896	0.823**	1.383**	
Swedish Father	0.915*	0.930	0.923	0.821*	1.255*	
Mixed Ethnicity	0.765**	0.749**	0.868	0.641**	1.266	
Unemployment Rate	0.974**	0.972**	1.003	0.969**	0.972*	0.972**
Disposable Income	1.049**	1.059	0.689	1.003	1.244**	1.084
Disp Income - Squared	1.000	1.000	1.148	1.011	0.984	0.999
Disp Income - Cubed	1.000	1.000	0.988	0.999	1.000	0.999
Labor Market Status						
Employed	ref. cat.					
Student	0.393**	0.447**	0.425**	0.364**	0.441**	0.375**
Welfare	1.041	1.001	1.369	1.045	0.838	1.035
Unemployed	0.986	1.072	0.847	0.873*	1.062	0.992
Non-Participant	0.296**	0.312**	0.207**	0.288**	0.388**	0.283**
Educational Level						
Primary	1.354**	1.258**	1.792**	1.476**	1.169	1.368**
Secondary	ref. cat.					
University	0.933*	0.936	0.608**	0.742**	1.006	1.011

* p<0.1, ** p<0.05.
Source: The Swedish Longitudinal Immigrant database (SLI).

Figure 2:   Graphical representation of baseline hazard of having first child
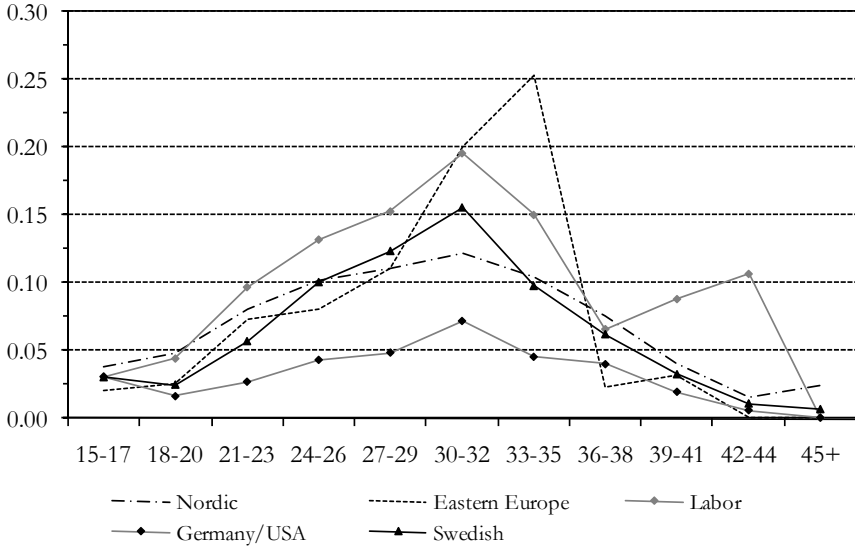
Looking first at the control variables for income and education, it is clear that income is positively associated with having a first birth for all women, in particular for women with German and US background. As expected, there is a very small negative effect in the quadratic of income indicating diminishing returns, but this effect is not significant and neither is the cubic effect. Education is a more important factor to consider. Generally, women with more education have lower risks of having a first birth than women with secondary education. Women with only primary education have a significantly higher risk of having a first birth. This association holds irrespective of nationality background, and is especially strong for women of Eastern European descent and women with a Southern European/Labor migration background. For childless women aged 15-30, education is even more important and generally the association between education and first births is stronger and to an even higher degree statistically significant for all women, irrespective of nationality background. Taking into consideration that it is not only individual-specific factors, such as the individual's education and own labor market status, that matter for childbearing decisions and the actual transition to parenthood, we investigate the association between the local labor market situation, or call it the local business climate, and first births. Our results point to a strong association between the local labor market situation and fertility: a negative local labor

market situation in one year, indicated by high unemployment and therefore greater than average insecurity, is negatively associated with the probability of having a first birth in the following year.

Turning to our main focus we see that the expectation of an effect of nationality background on the transition to parenthood is not altogether simple. Those women who behave most similar to the native Swedish-born are women with Eastern European background but this effect is not statistically significant.[14] Both women with a Nordic and a Southern European/Labor migration background have higher conditional risks of having a first birth than comparable native Swedish-born women whereas women of German and US descent have significantly lower conditional risks of having a first birth.

It is, however, clear that socioeconomic status is very important for the transition to parenthood. As expected, there is a positive association between labor market attachment and first-time motherhood since women that do not participate in the labor market have a significantly lower risk of having a first birth. This group only accounts for a very small fraction of women. Women who are unemployed have typically lower risks of becoming first-time mothers, but the effects are not statistically significant and in most cases very close to one (that is, to the value of reference category). Women on welfare typically have elevated conditional risks for becoming first-time mothers, with the exception being women with German/US background, but the effects are not statistically significant for any group. The strongest and definitely most significant result when it comes to socioeconomic status and activity is the association between being a student and having a first birth. The conditional hazard is in this respect very low for all women, irrespective of nationality background.

As expected, parental composition and the family situation during the formative years of childhood and adolescence seem to affect all women, but not in the same way with respect to nationality background. Obviously, having at least one Swedish-born parent reduces the conditional risk of having a first birth for all women but so does having two foreign-born parents of mixed nationalities. Turning to the nationality background specific effects of parent composition, having one Swedish-born parent seems to matter the most for women with a Southern European/Labor migration background and women with a German/US background, although the effects are completely different. For the former group, having one Swedish-born parent reduces the risk of having a first birth significantly whereas for the latter group having one Swedish-born parent elevates the risk of becoming a first-time mother – a reflection of the different fertility levels among first-generation immi-

---

14   This effect is not statistically significant for women aged 15-30, either. The estimations for this age group, however, yield very similar results to the estimations for the age group 15-45.

grants of these different backgrounds. For women with a Nordic or Eastern European background, having one Swedish-born parent yields no statistically significant effects. Having two foreign-born parents of different nationalities reduces the conditional risk of having a first birth for all women, irrespective of nationality background, even more than having one foreign-born and one Swedish-born parent. When it comes to the role of the mother, a particularly important component in the intergenerational transmission of fertility behavior, having a Swedish-born mother or father affects all women in a very similar way in that the conditional risk of becoming a first-time mother is reduced by approximately the same amount. This is the general impression for virtually all nationality backgrounds, with the exception for women with German/US background that have a somewhat more elevated conditional risk of becoming a first-time mother if the mother is Swedish-born.

6. Discussion

Our results confirm the general tendency over time to delay the transition to parenthood, and, more specifically for women, to concentrate first births in the ages around 30. We see that women with a Nordic background and women of German and US descent follow the same pattern for first-time childbearing, women with an Eastern European background concentrate their first births to a somewhat higher age (i.e. 33-36) whereas women with a Southern European/Labor migration background follow a more wave-like pattern with increased absolute risk of first births in the early thirties but also at higher ages. The Kaplan-Meier survival plots confirm a similar pattern for all groups of women, but indicate that, given this, there are some differences with respect to nationality background. Women with a Nordic as well as with a Southern European/Labor migration background have a higher propensity to start childbearing earlier than Swedish women, while women with an Eastern or German/US background begin childbearing somewhat later. The former group, however, experiences more of a catching-up process than the latter. This means that, if age-specific fertility patterns from our period of investigation persisted, virtually all women with a non-Swedish background would end up with a lower proportion of childless women at age 45 than the native Swedish-born women. The only exception to this being women with German/US background, who display a slightly higher level of childlessness at age 45.

Obviously, a substantial amount of integration has taken place over time with respect to the transition to parenthood and there is quite a distinct fertility pattern followed by both second generation immigrant and native Swedish-born women. But, at least when it comes to differences in the timing of first births, there is a division between groups. In contrast to our expectations, women with a Nordic

background are not the most proximate to native Swedish-born women when it comes to the propensity to become a first-time mother in a certain age. Nordic women follow the same age-pattern as women of Southern European/labor migration descent. On the other hand, women with German/US background that initially follow very closely the same age-pattern of first-time fertility as Swedish women have a slower progression to first births and eventually end up with a somewhat higher level of childlessness compared to all other women. This can be a reflection of, among other things, a strong orientation to education and work in this group despite that fact that work and family are quite compatible in Sweden.

As expected, socioeconomic status and activity, notably education and labor market attachment, are key factors determining the transition to parenthood for women of all backgrounds. When it comes to educational attainment, the fact that primary education is positively related to first births compared to that of secondary education, and that higher education is associated with somewhat lower conditional risks of having a first birth compared to that of secondary education indicates a conflict between higher education and childbearing and potentially a strong process of self-selection, channeling less family oriented women into higher education and more family oriented women into childbearing after only basic education. Educational enrolment, on the other hand, as a part of the analysis of the role of socioeconomic status and activity, confirms the incompatibility of studies with childbearing for all women. Being a student imposes the consistently strongest negative effect for all women, aside from non-participation, which is a fairly rare form of marginalization in contemporary Sweden. The results are in some way in accordance with the different immigrant experiences of different nationality backgrounds and in line with the segmented assimilation hypothesis. For example, for women with Southern European/labor migration descent, being a student, unemployed or non-participating in the labor force depresses the conditional risks of having a first birth significantly compared to being employed. It may be that this group of women to some degree over-adjusts to the Swedish welfare model, in line with the success-orientation of their parents who came as labor migrants. There is an indication, however, that some women follow this path, whereas other women follow a more traditional path with early childbearing, following on low educational attainment and little career and work orientation. The positive effect of being employed confirms our second hypothesis. The positive effect of current as well as previous labor market attachment (i.e. employment and unemployment) operates through the important association with the welfare system since it, as was previously discussed, has become increasingly important to have some kind of labor market experience before making use of welfare benefits such as parental leave (cf. Andersson/Scott, 2005, 2007; Dribe/Stanfors, 2009; Herd, 2005).

It is, of course, also important to account for the local labor market situation and business climate, especially at defining transitional moments in life such as the

transition to first-time motherhood. It is obvious from our results that good labor market conditions are associated higher first-birth fertility whereas a bad local business climate is associated with depressed first-birth fertility. The unemployment rate, to a very high degree, follows business cycles that reflect the degree of confidence in the future course of the economy, and low unemployment rates testify that times are good and people are willing to take on the economic burdens associated with parenthood. In less prosperous times, however, they tend to defer childbearing, especially if they are outside the labor market, but our results indicate that bad times also affect those who have a job, regardless of level of educational attainment, previous work experience or which sector they are employed in. It is therefore clear from our results that breadwinner qualities play a decisive role in the decision to become a parent. In Sweden, income security and stability are important prerequisites to start childbearing for all individuals. This is to a large extent due to the design of social and parental leave benefits that are income-based, currently yielding an income-replacement rate of 80 per cent of the gross pay for most people. The income-based benefits are much more generous than the flat rate benefit that is given to people with insufficient work experience. On the other hand, being of welfare does not render significant results, which indicates that the work-orientation, generally, is strong, among all women before having their first child.

Our results also show the importance of not only including women with different nationality backgrounds, and comparing their experiences prior to first births to that of native-born Swedish women, but also of incorporating parental composition. Parents and social circumstances in the parental household during the period of upbringing are of importance, not least for young people's life course transitions, of which entry into parenthood is one of the most important. Quite clearly, having two foreign-born parents or parents from different cultural backgrounds matter for the perception and acceptance of gender roles and values, fertility values, self-identification and work-family orientation. As expected, the parent composition and the family situation during the formative years of childhood and adolescence seem to affect all women, but not in the same way with respect to nationality background. Having at least one Swedish-born parent reduces the conditional risk of having a first birth for all women but having two foreign-born parents of mixed nationalities actually reduces the risks even more. Having one Swedish-born parent matters the most for women with a Southern European/labor migration background and women with German/US background, although the effects are completely different. For the women with at least one parent from Southern Europe or Turkey, having one Swedish-born parent reduces the risk of having a first birth significantly. This should be related to the fact that the general impression of second generation immigrant mothers is that of adaptation to Swedish patterns, but that some groups show evidence of cultural maintenance. In a study on Australian data, Abbasi-Shavazi and McDonald (2000) show that there is strong

evidence for cultural maintenance especially among women with Greek and Italian background and this goes for second generation immigrant women as well. If there is a rather strong family orientation and strong fertility values in the familiar cultural upbringing, those with two parents of the same nationality will probably have higher fertility values and therefore also higher conditional risks for having a first birth than those with one Swedish-born parent or two foreign-born parents of mixed nationality. For women with German/US background, fertility values are generally very low in Sweden, so, for this group of women, having one Swedish-born parent elevates the risk of becoming a first-time mother – a reflection of the different fertility levels among first-generation immigrants of these different backgrounds. For women with a Nordic or Eastern European background, having one Swedish-born parent yields no statistically significant effects. When it comes to the role of the mother, that we hypothesized to be particularly important in the intergenerational transmission of fertility behavior, having a Swedish-born mother or father affects all women in a very similar way in that the conditional risk of becoming a first-time mother is reduced. Our conclusion is that we cannot discern from our results exactly what role the mother does or does not play in affecting her daughter(s). It may be that Swedish fertility values are transmitted quite equally through both mothers and fathers but that the mother affects her daughter(s) work and family orientation through the provision of information and incentives with respect to education, the role of labor market attachment, being able to provide for oneself, and being a role model. In future research, we will devote more effort to these aspects and the issue of the role of the mother.

We conclude our discussion by stressing the fact that the strong positive relationship between employment and first-time childbearing and the negative relationships between educational enrolment and non-participation and childbearing among all women indicate that, for second generation immigrant women, integration has largely occurred, and nationality background does not matter that much. There is a strong norm that women first finish education, then establish themselves in the labor market, before becoming first-time mothers. There is, however, an effect of having a Swedish-born parent or being of otherwise mixed nationality background that reduces the propensity to have a first birth, all else equal. In general, there is a strong adherence to a Swedish childbearing norm among second generation mothers, which to some extent can be attributed to the universal and comprehensive Swedish welfare state that encompasses all citizens and give strong incentives for people to work.

7. Conclusion

This study has examined the extent to which the daughters of immigrants of different nationalities have integrated to Swedish fertility norms. Recent studies of the fertility of first generation immigrant women in Sweden have pointed to the seemingly extraordinary effects of the Nordic model of combining employment and childbearing through showing that native and immigrant women seem to respond to the same incentives in quite similar manners. Among first generation immigrant women, the fertility responses were almost the same as for native women to changes in labor market status. The exception was found among those on social assistance. In this group, immigrant women almost universally depressed their fertility while native women were not significantly different from those employed. This study confirms that the second generation manifests fertility adaptation and that the children of immigrants also appear to be affected by policies working through economic incentives. The fact that the category social assistance is no longer significantly different from being employed may indicate integration, not only in fertility patterns, but also in reliance on and belief in the welfare state. While this may not be an optimal outcome of integration, it is indicative that the second generation behaves more like natives than their parental generation. Differences between the groups arise largely from timing and the effects of education, suggesting that there may actually be a process of segmented integration occurring, with some groups investing more in careers and education, while others may see family formation as an alternative to less than desirable labor market prospects. Clearly, the most important aspect of immigrant integration, both for thr first generation and their descendants, is the working through the labor market. If the labor market is less hospitable to immigrants, a segmented rather than traditional assimilation process may be the case for those groups who do not gain a foothold. A comprehensive welfare state, however, enforces the importance of labor market attachment but, at the same time, mediates the effects of temporary failures and periods of distress. What will happen in the future is beyond the scope of this study, but our results indicate fertility adaptation is a process that is going on over time and immigrant generations. And so is a gradual increase in educational attainment and work orientation among all women. Taken together, these factors will probably have a further assimilative and integrative impact on second generation mothers.

References

Abbasi-Shavazi, M./McDonald, P. (2000): Fertility and Multiculturalism: Immigrant Fertility in Australia, 1977-1991. In: International Migration Review 34, 215-242.

Alba, R./ Nee, V. (1997): Rethinking Assimilation Theory for New Era of Immigration. In: International Migration Review 31, 826-874.

Alba, R./ Nee, V. (2003): Remaking the American Mainstream: Assimilation and Contemporary Immigration. Cambridge, MA: Harvard University Press.

Andersson, G. (2004): Childbearing After Migration: Fertility Patterns of Foreign-Born Women in Sweden. In: International Migration Review 38, 747-775.

Andersson, G./ Scott, K. (2005): Labour-market Status and First-time Parenthood: The Experience of Immigrant Women in Sweden, 1981–97. In: Population Studies 59, 21-38.

Andersson, G./ Scott, K. (2007): Childbearing Dynamics of Couples in a Universalistic Welfare State. In: Demographic Research 17, 897-938.

Bean, F.D./ Swicewood, C.G./ Berg, R. (2000): Mexican-Origin Fertility: New Patterns and Interpretations. In: Social Science Quarterly 81, 404-420.

Bean, F.D., et al. (1984): Generational Differences in Fertility among Mexican Americans: Implications for Assessing the Effects of Immigration. In: Social Science Quarterly 65, 573-582.

Becker, G.S. (1981): A Treatise on the Family. Cambridge, MA: Harvard University Press.

Bélanger, A./ Gilbert, S. (2003): The Fertility of Immigrant Women and Their Canadian-born Daughters. In: Report on the Demographic Situation in Canada. Ottawa: Statistics Canada.

Bengtsson, T./ Lundh, C./ Scott, K. (2005): From Boom to Bust. The Economic. Integration of Immigrants in Post-War Sweden. In: Zimmerman, K.F. (ed.): European Migration. What Do We Know? Oxford: Oxford University Press.

Bevelander, P./ Nielsen, H.S. (2001): Declining Employment Success of Immigrant Males in Sweden: Observed or Unobserved Characteristics? In: Journal of Population Economics 14, 455-471.

Billari, F.C./ Kohler, H-P. (2004): Patterns of low and lowest-low fertility in Europe. In: Population Studies 58, 161-176.

Blau, F.D. (1992): The Fertility of Immigrant Women: Evidence from High-Fertility Source Countries. In: Borjas, G.J./ R.B. Freeman (eds.): Immigration and the Work Force: Economic Consequences for the United States and Source Areas. Chicago, IL: University of Chicago Press.

Blau, F.D./ Kahn, L.M. (2007): Gender and Assimilation Among Mexican Americans. In: G. J. Borjas (ed.), Mexican Immigration to the United States. Chicago, IL: University of Chicago Press.

Blau, F.D., et al. (2008): The Transmission of Women's Fertility, Human Capital and Work Orientation Across Immigrant Generations. NBER Working Paper 14388. Cambridge, MA: NBER.

Bongaarts, J./ Potter, R.G. (1979): Fertility Effect of Seasonal Migration and Seasonal Variation in Fecundability: Test of a Useful Approximation under More General Conditions. In: Demography 16, 475-479.

Boyd, M./ Grieco, E.M. (1998): Triumphant Transitions: Socioeconomic Achievements of the Second Generation in Canada. In: International Migration Review 32, 853-876.

Brewster, K.L./ Rindfuss, R.R. (2000): Fertility and Women's Employment in Industrialized Nations. In: Annual Review of Sociology 26, 271-296.

Chiswick, B.R. (1978): The Effect of Americanization on the Earnings of Foreign-Born Men. In: Journal of Political Economy 86, 897-921.

Dribe, M./ Stanfors, M. (2009): Education, Work, and Parenthood: The Experience of Young Men and Women in Post-War Sweden. In: Journal of Family and Economic Issues 30, 32-42.

Engelhardt, H./ Kögel, T./ Prskawetz, A. (2004): Fertility and Women's Employment Reconsidered: a Macro-Level Time-Series Analysis for Developed Countries, 1960-2000. In: Population Studies 58, 109-120.

Ekberg, J. (1997): Hur är arbetsmarknaden för den andra generationens invandrare? In: Arbetsmarknad & arbetsliv 3, 5-16.

Ekberg, J. (1999): Immigration and the Public sector: Income Effects for the Native Population in Sweden, In: Journal of Population Economics 12, 411-430.

Fischer, N.A./ Marcum, J.P. (1984): Ethnic Integration, Socioeconomic Status, and Fertility among Mexican Americans. In: Social Science Quarterly 65, 583-593.

Ford, K. (1990): Duration of Residence in the United States and the Fertility of US Immigrants. In: International Migration Review 24, 34-38.

Forste, R./ Tienda, M. (1996): What's Behind Racial and Ethnic Fertility Differentials? In: Casterline, J.B./ Lee, R.D/ Foote, K.A (eds.): Fertility in the United States: New Patterns, New Theories. (A supplement to Population and Development Review 22).

Frank, R./ Heuveline, P. (2005): A Cross-Over in Mexican and Mexican-American Fertility Rates: Evidence and Explanations for an Emerging Paradox. In: Demographic Research 12, 77-104.

Gans, H.J. (1992): Comment: Ethnic Invention and Acculturation: A Bumpy-Line Approach. In: Journal of American Ethnic History 11, 42-52.

Glusker, A. (2003): Fertility patterns of native- and foreign-born women. Assimilating to diversity. New York: LFB Scholarly Publishing.

Goldstein, S./ Goldstein, A. (1983): Migration and Fertility in Peninsular Malaysia: An Analysis Using Life History Data. Santa Monica, CA: Rand Corporation.

Hammarstedt, M. (2002): Hur försörjer sig andra generationens invandrare? In: Ekonomisk debatt 30, 417-426.

Hammarstedt, M./ Ekberg, J. (2002): Social Assistance among Second Generation Immigrants in Sweden – The Importance of Family Background, paper presented at the EALE conference in Paris.

Herd, P. (2005): Reforming a Breadwinner Welfare State: Gender, Race, Class, and Social Security Reform. In: Social Forces 83, 1365-1393.

Kahn, J.R. (1988): Immigrant Selectivity and Fertility Adaptation in the United States. In: Social Forces 67, 108-127.

Kahn, J.R. (1994): Immigrant and Native Fertility During the 1980s: Adaptation and Expectation for the Future. In: International Migration Review 28, 501-519.

Lindstrom, D.P./ Saucedo, G.S. (2002): The Short- and Long-Term Effects of US Migration Experience on Mexican Women's Fertility. In: Social Force 80, 1341-1369.

Massey, D. (1981): Dimensions of the New Immigration to the United States and the Prospects for Assimilation. In: Annual Review of Sociology 7, 57-85.

Menken, J. (1979): Seasonal Migration and Seasonal Variation in Fecundability: Effects on Birth Rates and Birth Intervals. In: Demography 16, 103-119.

Morgan, S.P./ Watkins, S.C./ Ewbank, D. (1994): Generating Americans: Ethnic Differences in Fertility. In: Watkins, S.C. (ed.): After Ellis Island: Newcomers and Natives in the 1910 Census. New York: Russell Sage Foundation.

Månsson, J./ Ekberg, J. (2000): Second Generation Immigrants in the Swedish Labour Market. Working Paper Series No 4. School of Management and Economics, Växjö University.

Ng, E./ Nault, F. (1997): Fertility Among Recent Immigrant Women to Canada, 1991: An Examination of the Disruption Hypothesis. In: International Migration 35, 559-580.

Österberg, T. (2000): Economic Perspectives on immigrants and Intergenerational Transmissions. Thesis. Department of Economics, Gothenburg University.

Parrado, E./ Morgan, S.P. (2008): Intergenerational Fertility Among Hispanic Women: New Evidence of Immigrant Assimilation. In: Demography 45, 651-671.

Portes, A. (1995): Children of Immigrants: Segmented Assimilation and its Determinants. In: Portes, A. (ed.): The Economic Sociology of Immigration: Essays on Networks, Ethnicity, and Entrepreneurship. New York: Russell Sage.

Portes, A./ Rumbaut, R.G. (1996): Immigrant America : A Portrait. Berkeley, CA: University of California Press.

Portes, A./ Rumbaut, R.G. (2001) : Legacies: the Story of the Immigrant Second Generation. Berkeley and Los Angeles, CA: University of California Press.

Portes, A./ Zhou, M. (1993): The New Second Generation: Segmented Assimilation and Its Variants. In: Annals of the American Academy of Political and Social Science, 74-96.

Rindfuss, R.R. (1976): Annual Fertility Rates from Census Data on Own Children: Comparisons with Vital Statistics Data for the United States. In: Demography 13, 235-249.

Rooth, D-O. (1999): Refugee Immigrants in Sweden: Educational Investments and Labour Market Integration (Lund Economic Studies no. 84). Thesis. Department of Economics, Lund University.

Rooth, D.-O./ Ekberg, J. (2003): Unemployent and Earnings for Second Generation Immigrants in Sweden. Ethnic Background and Parent composition. In: Journal of Population Economics 16, 787–814.

Rosenwaike, I. (1973): Two Generations of Italians in America: Their Fertility Experience. In: International Migration Review 7, 271-180.

Rutenberg, N./ Watkins, S.C. (1997): The Buzz Outside the Clinics: Conversations and Contraception in Nyanza Province, Kenya. In: Studies in Family Planning 28, 290-307.

Scott, K. (1999): The Immigrant Experience: Changing Employment and Income Patterns in Sweden, 1970 – 1993. Lund: Lund University Press

Stanfors, M. (2003): Education, Labor Force Participation and Changing Fertility Patterns. A Study of Women and Socioeconomic Change in Twentieth Century Sweden. Stockholm: Almqvist & Wiksell International.

Stephen, G./ Bean, F. (1992): Assimilation, Disruption, and the Fertility of Mexican American Women in the United States, In: International Migration Review 26, 67-88.

Vilhelmsson, R. (2002): Ethnic Differences in the Swedish Youth Labor Market. In: Wages and unemployment of immigrants and natives in Sweden. Thesis. Institute of Social Research, Stockholm University.

Waldinger, R/ Feliciano, C. (2004): Will the New Second Generation Experience "Downward Assimilation"? Segmented Assimilation Re-Assessed. In: Ethnic and Racial Studies 27, 376-402.

Watkins, S.C./ Danzi, A. (1995): Women's Gossip and Social Change: Childbirth and Fertility Control among Italian and Jewish Women in the United States, 1920-1940. In: Gender and Society 9, 469-490.

Zhou, M. (1997): Growing Up American: The Challenge Confronting Immigrant Children and Children of Immigrants. In: Annual Review of Sociology 23, 63-95.

Selection, Social Status or Data Artefact - What Determines the Mortality of Migrants in Germany?

Martin Kohls

1. Introduction

Numerous studies have shown that the mortality pattern of migrants is different from the mortality pattern of non-migrants because of various living and social conditions (e.g., food, health care, working conditions) as well as different experiences in the country of origin (e.g., Krueger/Moriyama, 1967; Coleman, 1982; Marmot et al., 1984; Altenhofen/Weber, 1993; Harding, 2000; Ronellenfitsch et al., 2006). As a result, migrants often have lower mortality rates than the local population, in spite of their lower socioeconomic status. This finding is in contradiction to the correlation between low socioeconomic status and high mortality known from several studies, and is therefore often referred to as a "paradox."

Several determinants affect the mortality of migrants. People who migrate are, on average, healthier than the population they originate from. This "healthy-migrant effect" is due to a (self-) selection process; i.e., chronically ill or disabled persons are less likely to migrate. Another selection process can be observed in cases of remigration. Retired or ill migrants tend to remigrate to the countries of origin, while young and healthy people stay in the host country. These selection processes may be expected to lead to lower mortality levels among migrants, and nearly all studies on Germany have found that mortality rates are lower for migrants.

But these results may be affected by poor data quality. In Germany, migrant mortality can hardly be calculated using official statistics because these data show biases, especially in migrant populations. Migrants often fail to deregister at the local registry office when they remigrate, which leads to an overestimation of the numbers of migrants in Germany. Furthermore, the number of deaths of migrants in Germany is underestimated because migrants who are not deregistered at the local registry office, but who have remigrated and died abroad, are not considered in the German death statistics. In sum, there is a dual gap in the official data when it comes to analysing immigrant mortality. To estimate the mortality of migrants in Germany without data biases, other databases have to be used. Therefore, data from the German Statutory Pension Insurance (*Gesetzliche Rentenversicherung*), as well

153

as from the German Central Register of Foreigners (*Ausländerzentralregister*), are used in this study.

2. Theoretical considerations

2.1 Definitions

An international migrant is a person who changes his or her place of residence by crossing a national border. Long-term migrants are defined as migrants who stay at least 12 months in the destination country, "and who either must never have been in that country at least once continuously for more than one year, must have been away continuously for more than one year since the last stay of more than one year" (UN, 1998: 5). By contrast, short-term migrants intend to stay three to 12 months in the destination country. Visitors, commuters, businessmen, tourists, travelers or pilgrims are never characterised as migrants. In Germany, a person is considered to be an international migrant when he or she immigrates and registers at the local registry office. Prior residences, reasons for migration, as well as the intended duration of stay are not recorded in the German migration statistics (Kohls, 2007).

In the past, the number of migrants in Germany could be estimated using the nationality. As a result of naturalisations and migrant births, this estimation becomes more and more incorrect (Schenk, 2007; Schimany, 2007; BAMF, 2008; Kohls, 2008a). This is why, in 2005, the German Federal Statistical Office (2007) introduced the concept of "persons of migrant origin" (*Personen mit Migrationshintergrund*). This term refers to both foreign nationals and German citizens, including German citizens who are themselves migrants (repatriates or naturalised foreigners), and to their children and grandchildren born in Germany. However, up to now only a few databases existed which included both the "person of migrant origin" definition and the mortality data. In this study, only the mortality of foreigners is considered.[1]

2.2 Determinants on migrant mortality

This study focuses on the mortality of migrants, and the determinants of mortality among migrant groups. It should be noted, however, that the mortality of an individual is highly correlated with his or her morbidity. The more often a person

---

[1] Only individuals who have one or several foreign nationalities are included. When people have both German and foreign nationalities, they are not included.

suffers from diseases, the higher is his or her risk of dying relative to that of a person who is less prone to illness (Kohls, 2008a). For that reason, morbidity factors also have to be discussed. In sum, while the mortality of migrants is influenced by aspects of the country of origin, aspects of the destination country, selection processes, socio-demographic aspects and other factors; the relevance of the determinants changes as a function of the length of stay (Fig. 1).

Figure 1:   Determinants of migrant morbidity and mortality
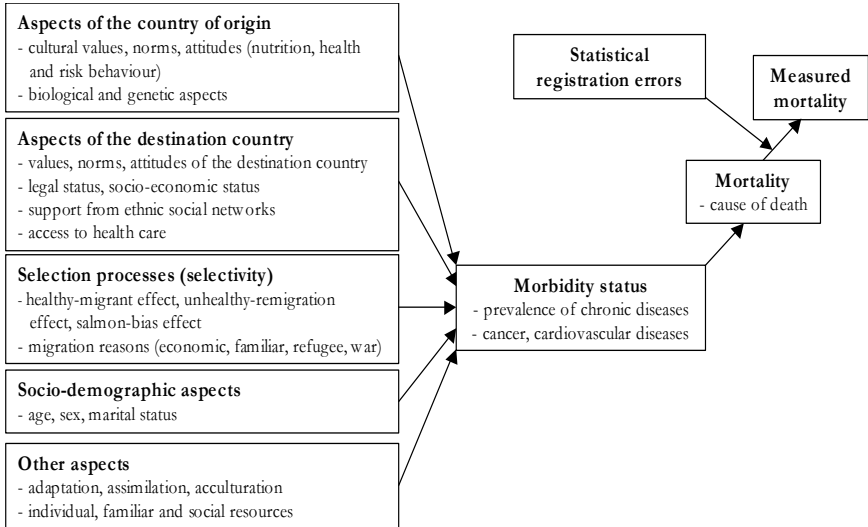
Source: Kohls (2008a).

2.2.1 Selection processes at immigration and remigration

Selection processes at immigration are often used to explain the mortality differences between migrants and non-migrants. These processes characterise the better health and mortality status of migrants relative to non-migrants (Ravenstein, 1885; Lee 1966). At immigration, the process is described as the healthy-migrant effect, a (self-) selection process that leads to a temporarily lower level of mortality in the destination country. But the longer the length of stay, the lower the mortality advantage is compared to that of the non-migrant population, due to the lower social status of migrants (Elkeles/Mielck, 1997; Razum/Rohrmann, 2002). Furthermore, the geographical and economic distance between the origin and destination coun-

tries influences the degree of the healthy-migrant effect: the smaller the geographical and economic distance, the lower the levels of selectivity (Jasso et al., 2004). If the "distance" is greater, potential migrants have to show special attributes (e.g., age or physical and mental health). As a result, the effect should vary between migrant groups (Kohls, 2008a).

The selection processes at immigration might primarily affect the immigrant population itself, and may be lower with increasing length of stay (Williams, 1993; Chaturvedi/McKeigue, 1994). In second and third immigrant generations, mortality differences between migrant and non-migrant population should no longer be observed; instead, social mortality differences should become evident (Razum/ Rohrmann, 2002; Razum 2006).

Selection processes also occur at remigration. In particular, sick migrants with short lengths of stay may expect to receive better health care and psychological support in the "well-known" country of origin (Dietzel-Papakyriakou, 1987; Weber et al., 1990; Courbage/Khlat, 1996; Razum et al., 1998b). This aspect is characterised as the "salmon-bias" effect (Abraido-Lanza et al., 1999; Palloni/Arias, 2004; Turra et al., 2005), or as the "unhealthy-remigration" effect (Razum et al., 1998b). Other reasons for remigration include reaching pension age, dissatisfaction as a result of unemployment, unfulfilled ambitions, failed social integration and permanent economic, political or social inequalities (Fabian/Straka, 1993; Abraido-Lanza et al., 1999).

The healthy-worker effect is also used to explain migrant mortality (Razum et al., 1998b). This term arises from the observation that working people are, on average, healthier than non-working people based on a self-selection process (McMichael, 1976; Fox/Collier, 1976). The healthy-migrant effect and the healthy-worker effect are highly correlated with each other. But the healthy-migrant effect is more important when analysing migrant mortality, because self-selection processes at migration usually occur before beginning a job. Thus, the healthy-worker effect can be understood as a consequence of the healthy-migrant effect (Kohls, 2008a).

2.2.2 Migration, health and social status

Several studies have shown that migrants suffer more from infectious diseases than non-migrants (Marmot et al., 1984; Korporal, 1990). For example, the prevalence of tuberculosis is higher for migrants than for non-migrants (Haas et al., 2006). In contrast, migrants suffer from cardiovascular diseases far less frequently than non-migrants, although the risk factor "obesity" is twice as high (Kurth/Schaffrath-Rosario, 2007). This is explained by different dietary customs, especially concerning

the choice of foods that are high in unsaturated fat acids (Courbage/Khlat, 1996; Kouris-Blazos, 2002).[2]

The mortality differences between migrants and non-migrants, as well as between several migrant groups, had often been linked with the (macro-level) model of the epidemiological transition. This model describes the transition from mortality patterns with high prevalences of infectious diseases and high infant and pregnant mortality, to a mortality pattern with mainly chronic, non-infectious diseases (Omran, 1971; Dinkel, 1989; Schimany, 2003). Therefore, according to this model, the highly developed countries of Western Europe and North America have already reached the final stage of the epidemiological transition, while less developed states still stand at the beginning of the transition (Razum/Twardella, 2002).

On the micro level, it has been observed that immigrants from the former Soviet Union have the same levels of cigarette and alcohol consumption as the German population (Schenk, 2002; Zeeb et al., 2002; Settertobulte, 2005). However, immigrants tend to injest their daily amount of alcohol in the form of high-alcohol drinks (Aparicio et al., 2005). Meanwhile, Turkish migrants appear to have a lower incidence of lung and larynx cancer. Although the proportion of smokers is higher in the Turkish than in the German population, migrants have been shown to consume less tobacco per day (Zeeb et al., 2002; RKI 2008).

Inequalities in health care may also partly account for the observed differences in migrant and non-migrant mortality levels (Mehle, 1981; Kentenich et al., 1984; Collatz, 1989; Lechner/Mielck, 1998; Schenk, 2007). Several studies have shown that migrants have below-average levels of participation in cancer screenings, dental health visits and vaccinations. Migrants may avoid preventive medical checks because such checks were unusual in their countries of origin (Schenk, 2002). Language problems, lack of information, as well as cultural differences, support this behaviour (Duncan/Simmons, 1996; Local Health Office Nürnberg, 1997; Zeeb et al., 2004; Aparicio et al., 2005; RKI, 2008).

In addition to health factors, migrants are often confronted with social problems (Collatz, 1994; Bollini/Siem, 1995; Siahpush/Singh, 1999). Several studies have shown that people with low social status have a high prevalence of cardiovascular diseases with high mortality and morbidity rates. Thus, low social status is associated with an increased mortality risk and lower life expectancy. (Oppolzer, 1986; Marmot et al., 1991; Elkeles/Seifert, 1993; Klein, 1993a, 1993b; Steinkamp, 1993; Voges, 1996; Helmert et al., 2002). In Germany, the social status of migrants is below average in part because many migrants were of low educational and social status in the country of origin. Therefore, migrants may be expected to have higher

---

2 There are heated about the causal effects of Mediterranean nutrition on mortality (see Danesh et al., 2007).

rates of mortality than non-migrants, especially as they remain in the country for longer periods of time (Elkeles/Mielck, 1997; Harding, 2000; Razum/Rohrmann, 2002; RKI, 2008).

The link between migration and social status is usually connected to the discussion of the social status and degree of adaptation of migrants (Kliewer, 1992; Jasso et al., 2004). During the period immediately following immigration, migrants tend to maintain the lifestyle of the country of origin, and participate in the social networks of their ethnic communities in the destination country. Migrants are thus protected against the (potentially unhealthy) lifestyle of the destination country. As a result, they have better health and lower mortality than the non-migrant population (Abraido-Lanza et al., 1999; Palloni/Arias, 2004). But, as they remain in the country for longer periods of time, a convergence of migrant and non-migrant mortality can be observed. This convergence is often attributed to changes in diet, health behaviours and risk behaviours, and also to migrants' exposure to socioeconomic inequalities in the destination country (Kliewer, 1992; Razum/Rohrmann, 2002; Jasso et al., 2004).

2.2.3 Statistical registration of migrants

In order to calculate mortality risks, data on the number of deaths and the population stock are required. However, the statistical registration of migrant deaths and the migrant population stock is very complex (Weitoft et al., 1999; Palloni/Arias, 2004). In Germany, in particular, the migrant population stock is overestimated in official statistics because outmigration is insufficiently registered. Furthermore, migrant deaths are underestimated, largely because deaths of migrants who remain registered in Germany, but who die outside of Germany, are not included in official death statistics (Neumann, 1991; Richter 2006). Due to these two gaps in the data, there is an underestimation of the mortality of migrants in Germany (Kohls, 2008a).

2.2.4 Other determinants

A further aspect of immigration is the psychological stress of adaptation to a new climate, and to social and cultural conditions in the destination country (Hull, 1979; Shuval, 1982; Kasl/Berkman, 1985; King/Locke, 1987; Kliewer, 1992). Given the challenges associated with immigration, mortality rates among migrants from external causes (e.g., accidents, suicide and homicide) may be expected to be much higher than for non-migrants (Marmot et al., 1984; Young, 1987; Trovato/Clogg, 1992). In addition, migrants from less developed countries might have suffered more from environmental pollution than migrants from more developed countries

(Rothenbacher et al., 1998; Zeeb/Razum, 2006). Possible biological and genetic effects on migrant mortality have also been posited (Zeeb/Razum, 2006; Schenk 2007), but not empirically proven.

3. Data and studies concerning migrant mortality in Germany

There are relatively few migrant mortality studies in Germany, even though an estimated 6.75 million foreigners or 15.4 million individuals of migrant origin were living in Germany in 2007. This dearth of research may be due to the restricted quantity and quality of existing data (Kohls, 2008a).

3.1 Official death statistics, cause of death statistics

The most important source of data for migrant mortality analyses remains the official death statistics database for Germany[3], even though registrations of the migrant population stock and migrant deaths are known to be incomplete (Chap. 2.2.3). Several studies have used the official death statistics to estimate migrant mortality in Germany since the 1970s. These studies found that, among residents of Germany between the ages of 25 and 64, German citizens clearly have higher mortality rates than foreigners (Weber et al., 1990; Korporal, 1990; Mammey, 1990; Altenhofen/Weber, 1993; Mammey/Schwarz, 1995; Roloff, 1997; RKI, 2008; Kohls, 2008b). Studies of differences in cardiovascular mortality rates produced similar results (Weber et al., 1990; Razum et al., 1998a, 1998b; Kohls, 2008c). Using that data as a basis, Zeeb et al. (2002) calculated cancer mortality rates from 1980 to 1997. The authors found that Turkish nationals living in Germany had much lower levels of cancer mortality than Germans. But, while cancer mortality rates among Germans were found to have decreased over time, they were shown to have increased slightly among Turks. The below-average cancer mortality of Turkish migrants is often explained using the concept of epidemiological transition, which asserts that less-developed countries have different cause-of-death patterns than highly developed countries (Chap. 2.2.2).

---

3   For scientific research, this data is available at www.forschungsdatenzentrum.de.

3.2 Central Register of Foreigners (Ausländerzentralregister, AZR)

All foreigners officially registered in Germany are recorded in the Central Register of Foreigners, which includes information about age, sex, nationality, date of immigration and date of death. But, if the time of death dates back more than five years, all individual data is deleted. Thus, long-term analyses are not possible (Kohls, 2008a). Furthermore, AZR data on the foreign population stock from 2000 to 2004 underwent a revision. As a result, the estimated foreign population stock was adjusted downwards by around 600,000 persons (Opfermann et al., 2006). Thus, valid migrant mortality analyses are only meaningful from 2005 onwards (see Chap. 4.2).

3.3 Statutory Pension Insurance (Gesetzliche Rentenversicherung, GRV)

Migrant mortality analyses can also be conducted using Statutory Pension Insurance data. The GRV databases have a high degree of validity because the registration status of pensioners depends directly on pension payments. Status changes, such as immigration, emigration and the date of death, are documented precisely. A drawback of using this database is that the GRV does not represent the total German population, because certain groups, like civil servants, the self-employed or housewives, are not included.[4]

Scholz (2005) and Salzmann/Kohls (2006) used the databases of the Statutory Pension Insurance, and found that foreign pensioners who live in Germany or abroad have lower mortality rates than German pensioners. Kibele et al. (2008) and Kohls (2009) further showed that German pensioners who live in Germany have lower mortality rates than foreigners who live in Germany. Among pensioners of low occupational status, the difference between migrants and non-migrants are higher than among pensioners of high occupational status (Kibele et al., 2008).

3.4 Other databases

Migrant mortality studies based on the Compulsory Health Insurance and the German Socioeconomic Panel also found lower mortality rates among foreigners (Razum et al., 2000; Helmert et al., 2002; Razum/Rohrmann, 2002).

Analyses of the total and cardiovascular mortality rates among ethnic Germans from the former Soviet Union (*Aussiedler*) came to the surprising conclusion that the

---

4 This data is also available for scientific research: see www.fdz-rv.de

mortality of these migrants was significantly lower than that of the non-migrant population of North Rhine-Westphalia (Kyobutungi et al., 2005; Ronellenfitsch et al., 2006; Becher et al., 2007). The explanation for this finding could be that this migrant group was a selected population in the country of origin who may have engaged in health, risk and social behaviours that differed from those of the majority population of the former Soviet population.[5]

4. Empirical results

4.1 Migrant mortality based on official death statistics[6]

The mortality differences between foreigners and Germans are especially apparent when looking at the official death statistics. In 1971, the difference in mortality rates between foreigners and Germans was found to be relatively small when measured using the direct method death rate (DMDR)[7]. Thereafter, this difference increased, and reached its largest size in 1986 (Kohls, 2008b). As a result of the German census in 1987, the population stock of foreigners in particular was adjusted downwards. Thus, assuming the numbers of deaths are unchanged, the reduction in the migrant population stock led automatically to a rising level of mortality that could be observed in the years 1987 and 1988 (Fig. 2).

Hence, in 1988 the mortality gap between the foreign and German population had the lowest value. From 1989 to 1990, the discrepancy again increased because the biases in the foreign population stock became more important. Thereafter, the relative mortality differences between Germans and foreigners continuously declined until 2006 (Kohls, 2008b).

It is possible to conclude that the migrant mortality measures based on official death statistics show implausible values. The "real" migrant mortality must be much lower because of gaps in the data, especially for the migrant population stock (Chap. 2.2.3). However, realistic estimates based on information contained in this database cannot be made before 2013, when detailed results of the German census in 2011 are available (Heinzel, 2006).

---

5 This has also been proven for the Jewish population in Moscow (Shkolnikov et al., 2004).
6 Using official statistics only the former Federal Republic of Germany is included to avoid breaks in the time-series.
7 DMDR represents the mortality pattern without the influence of the particular age structure of the population; see Chiang (1984).

Figure 2:   Relative trend of total direct method death rate (DMDR) and age-specific mortality rate of Foreigners from 1970 to 2006 (1970 = 1), Western federal states, men, official statistics
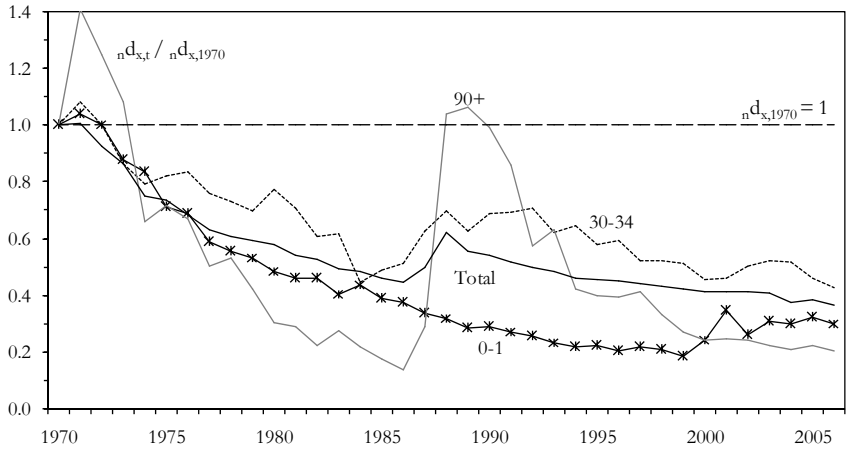
Source: Calculations based on German Federal Statistical Office.

4.2 Migrant mortality based on the Central Register of Foreigners (AZR)

According to data from the AZR, the relative mortality of Germans to foreigners is about 50 percentage points lower than in the calculation based on official death statistics (Kohls, 2008b). The age-specific mortality between the ages of 10 and 64 is, in the AZR, on average about 10 per cent higher than in the official statistics (both sexes). But the differences increase at higher ages. Thus, mortality above age 85 is, in the AZR, approximately 2.5 times higher than in the official death statistics (Kohls, 2008b).

It is possible to use the AZR for mortality analyses of single migrant groups. Because of the small case numbers, some nationalities had to be grouped (Tab. 1). The largest number of all migrants deaths recorded in the AZR in 2005/2006 were among Turkish migrants: there were 5,574 deaths among Turkish men and 2,448 among Turkish women, representing 23.6 per cent of all male and 18.3 per cent of all female migrant deaths. However, according to AZR data, only 531 male migrants and 216 female migrants from Africa died in 2005/2006. Because no deaths were registered in some age groups, the calculation of the DMDR is not possible in this case. Thus, the computation of another mortality measure is required which takes this problem into consideration. The standardised mortality ratio (SMR) meets this

condition (Marmot et al., 1984). In this case, the German population is used as the reference group (=1.000).[8]

Table 1:   Migrant groups

Neighbouring countries of Germany	Former Yugoslavia	Former guest worker countries	Other European states	Other states
- Belgium	- Bosnia	- Greece	- Other	- Australia
- Denmark	- Herzegovina	- Italy	European	- Oceania
- France	- Croatia	- Portugal	States without	- Stateless
- Luxembourg	- Slovenia	- Spain	Turkey	- Ambiguous
- The Netherlands	- Serbia			- Not specified
- Austria	- Montenegro			
- Switzerland	- Macedonia			

Men from states that border Germany (0.74), from former Yugoslavian states (0.74), as well as from other states (1.01), had the highest SMR in 2005/2006. Women from the former guest worker states (0.59) had the lowest SMR, followed by Americans (0.62) and Asians (0.64). Only Africans (0.82) and women from other states (0.97), clearly had a higher SMR (Tab. 2).

In addition to the Turks, the mortality rates of other nationalities were also examined. To better assess the significance of the results, a summarised analysis from 2003 to 2006 was conducted. Stateless migrants (SMR: men: 1.07; women: 1.11) and women from Black Africa[9] (1.30) were found to have higher mortality rates than the German population (Tab. 3). Although the difference is not significant, it indicates that insecure living conditions (which are common among stateless persons) lead to poor health status and increased mortality. The higher mortality of the Black African women cannot be completely explained. According to the healthy-migrant hypothesis, women who have travelled great distances may be expected to enjoy better health. However, it could be the case that diseases or environmental factors in the country of origin result in higher levels of mortality in Germany (Chap. 2.2.4). To help explain this phenomenon, a detailed cause-of-death analysis would be helpful.

---

8 For example, a result of 0.700 for Turkish men indicates that only 70.0 % of Turkish deaths in 2005/2006 were observed, which would have been expected if Turkish men had displayed the same mortality patterns as German men. The observed mortality of Turkish men was, in reality, lower than that of German men.
9 In this study persons from Ghana, Nigeria, Togo, Cameroon and the Democratic Republic of the Congo are included, who represent about 75 % of the African-origin population in Germany.

Table 2:   Mortality of selected migrant groups, 2005/2006, Germany, AZR

Neighbouring countries of Germany	**Turkey**	**Former Yugoslavia**	**Former guest worker countries**	**Other European States**	**Africa**	**America**	**Asia**	**Other states**	**Germans (Official statistics)**
				Men					
Deaths									
3,281	5,574	3,849	4,796	3,089	531	722	1,231	518	753,319
Direct method death rate (DMDR), per 1.000									
5.8	4.8	5.2	4.9	4.9	3.5	4.5	3.9	8.2	7.8
Standardised mortality ratio (SMR), Reference: Germans									
0.736+	0.700+	0.738+	0.627*	0.614*	0.568	0.572+	0.548	1.008	1.000
				Women					
Deaths									
2,509	2,448	2,042	1,854	2,548	216	557	919	293	864,862
Direct method death rate (DMDR), per 1.000									
3.9	3.0	3.7	2.9	3.3	2.6	3.2	3.1	5.1	5.1
Standardised mortality ratio (SMR), Reference: Germans									
0.770+	0.682	0.818	0.589+	0.660+	0.823	0.618	0.635	0.971	1.000

+ Significant at 90%-level.; * Significant at 95%-level.
Source: Own calculations based on data of the AZR (date of query: 11/30/2008).

Table 3: Mortality of selected nationalities using SMR, 2003/2006, Germany, AZR

	Belgium	Kazakhstan	Morocco	Thailand	Iraq	Afghanistan	Black Africa	Stateless	Foreigners	Germans (Official statistics)
Men										
Deaths	351	268	348	n.a.	164	258	233	496	47,416	1,512,382
Standardised mortality ratio (SMR), Reference: Germans	0.763	0.934	0.399+	n.a.	0.462+	0.573	0.672	1.073	0.614*	1.000
Standardised mortality ratio (SMR), Reference: Non-Germans	1.199	1.525	0.610	n.a.	0.743	0.902	1.120	1.738*	1.000	1.629*
Women										
Deaths	217	181	n.a.	193	91	257	119	329	26,797	1,745,424
Standardised mortality ratio (SMR). Reference: Germans	0.691	0.718	n.a.	0.948	0.751	0.761	1.298	1.111	0.621*	1.00
Standardised mortality ratio (SMR). Reference: Non-Germans	1.057	1.078	n.a.	1.455	1.065	1.130	1.887+	1.754*	1.000	1.610*

+ Significant at 90%-level; * Significant at 95%-level; n.a. = not available.
Source: Own calculations based on data of the AZR (date of query: 11/30/2008).

Mortality rates among Thai women are below those of German women, but are still around 50 per cent higher than the average for migrants. The selection hypothesis would suggest that this difference occurs because Thai women often immigrate due to marriage. Therefore, these women often do not benefit from the healthy-migrant effect. In addition, Thai women have been shown to have lower levels of participation than other migrant groups in the German health insurance system because of poor language skills (RKI, 2008).

Men from Kazakhstan, Georgia and Kyrgyzstan were found to have mortality levels around 50 per cent higher than the average for migrants. This could be attributable to the unhealthy lifestyle in the country of origin. Some authors have also found that migrants from the former Soviet Union have had higher mortality rates than Central Europeans since the beginning of the 1990s. This development has been attributed primarily to risky and unhealthy behaviours (Shkolnikov, 2004; Becher et al., 2007).

Special attention should be given to migrants from Iraq and Afghanistan, because a portion of them have experienced traumatic events, mainly associated with war. According to the hypothesis positing that stress factors negatively affect life expectancy (Chap. 2.2.4) these migrants may be expected to have high levels of mortality in Germany. However, migrants from these countries have much lower mortality rates than the Germans, and slightly lower mortality rates than the total migrant population. These findings may indicate that stress factors do not determine the morbidity and mortality of foreigners in Germany, but the (social) selection processes of migration could not be controlled for in the analysis.

4.2.1 Migrant mortality and length of stay

The results of some studies have shown that the length of stay in the destination country influences the mortality rates of migrants (Chap. 2.2.2). Thus, the amount of time that has elapsed since immigration is an adequate indicator for the adaptation processes of migrants in the destination country (in terms of dietary habits and risk, social and health behaviours). Mortality differences between migrants and non-migrants should therefore be expected to disappear with increasing length of stay, or to be determined by other factors, especially social aspects.

Fig. 3 and 4 represent the correlation between the mortality of foreigners and the length of stay in groups ranging from ages 25-29 to ages 90 and above. The horizontal broken line characterises the age-specific mortality of foreigners across all "durations," and is therefore consistent with the value 1 ($_nd_x$, migrants = 1). All other lines have to be seen in relation to that line. The age-specific mortality of Germans (broken line) is charted for comparison.

The relative mortality of migrants with durations of zero to four years was found to be below average in the age groups from 25 to 44. However, between the ages of 45 and 59 were shown to have higher relative mortality levels, and migrants above age 85 were clearly shown to have higher levels of mortality (Fig. 3). By contrast, among migrants with durations of zero to four years and five to 19 years, those in the age groups from 25 to 44 with shorter durations were found to have the lowest mortality. In the age group above 85, an opposite trend can be observed that is possibly determined by the different usage of health care. Thus, migrants with shorter durations usually have lower levels of German language skills, and are thus unable to take full advantage of health care services. Furthermore, migrants may have had pre-existing diseases which were insufficiently medicated in the country of origin. However, it becomes evident that even migrants with longer durations still have lower rates of mortality than the German population (Fig. 3).

Figure 3:   Age-specific mortality differences between Germans and Foreigners ($_nd_x$, migrants = 1) in consideration of duration (0-19 years), 2005/06, Germany, men, Central Register of Foreigners (AZR)
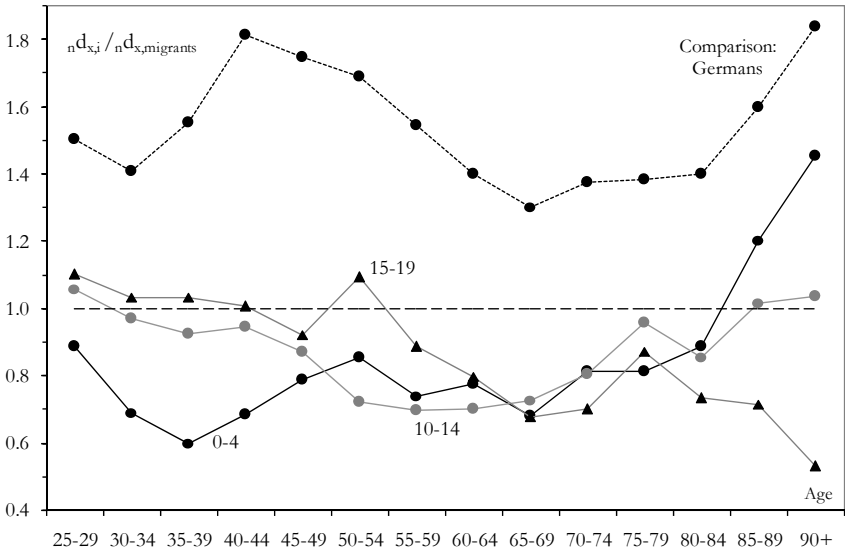
Source: Own calculation based on data of the AZR (date of query: 11/30/2008) and the German Federal Statistical Office.

A different trend can be seen among foreigners who have been living in Germany for more than 30 years (Fig. 4). Younger migrants who are long-term residents or who were born in Germany were found to have above-average mortality rates. Foreigners with durations of 40 or more years who are between the ages of 45 and 59 were shown to have approximately the same mortality levels as the German population in the same age groups. Foreigners with shorter durations (30 to 39 years) were found to have below-average mortality in higher age groups (Fig. 4).

The observed trends confirm the hypothesis that adaptation processes lead to a convergence of mortality patterns among foreign and German populations. The finding that foreigners who were born in Germany have above-average mortality would confirm the hypothesis that second-generation immigrants no longer benefit from the healthy-migrant effect. However, migrant group-specific influences could not be considered in this analysis. If certain migrant groups display distinct mortality patterns, these differences should strongly influence migrant mortality levels. As long as these group-specific factors cannot be controlled for, the results of this study remain preliminary (Kohls, 2008a).

Figure 4: Age-specific mortality differences between Germans and Foreigners ($_nd_x$, migrants = 1) in consideration of duration (30 and more years), 2005/06, Germany, men, Central Register of Foreigners (AZR)
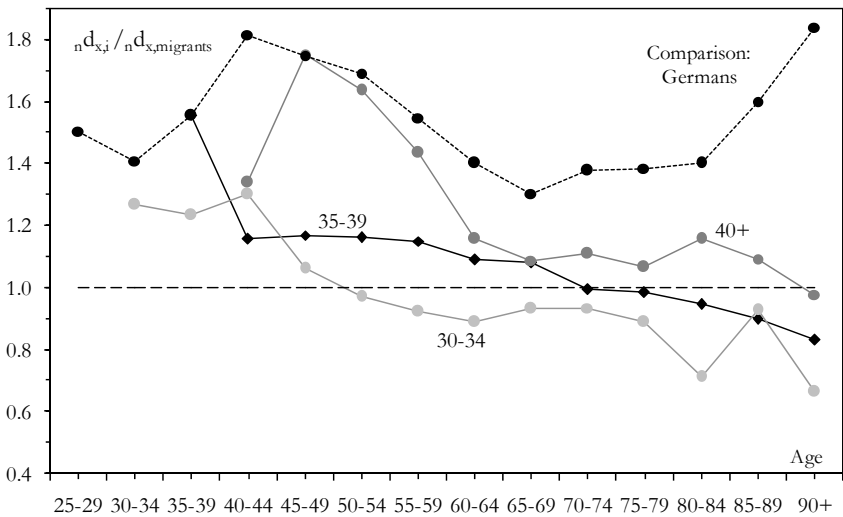

Source: Own calculations based on data of the AZR (date of query: 11/30/2008) and the German Federal Statistical Office.

4.3 Migrant mortality based on data of the Statutory Pension Insurance (GRV)

The mortality differences in the GRV between Germans and foreigners have been declining continuously since 1995. Indeed, the average remaining life expectancy for a foreigner at age 60 increased from 18.3 to 19.1 years in the period from 1995 to 2005. At the same time, the remaining life expectancy at age 60 for Germans rose from 17.9 to 19.8 years. Thus, the difference between foreigners and Germans shifted from plus 0.4 to minus 0.7 years. Among foreign women, the remaining life expectancy of a 60-year-old increased from 23.6 years in 1995 to 24.1 years in 2005, while the corresponding increase among German women was from 23.0 to 24.5 years.

In the period between 2001 and 2005, foreigners from the former guest worker countries were found to have the highest number of observed deaths above age 60 in the GRV. This is not surprising since guest workers represent the largest immigrant group in Germany, having arrived in significant numbers in the 1960s and 1970s. In contrast, only a few male (746) and female deaths (35) among African migrants were registered over this period (Tab. 4). African (21.1 years) and Turkish (20.6 years) men resident in Germany displayed the highest remaining life expectancy at age 60, while the average life expectancy among all male foreigners amounted to 19.2 years. Foreigners from the former Yugoslavia had a remaining life expectancy at age 60 that was 1.6 years lower than the average among all foreigners. Asian (24.9 years) and Turkish (24.6 years) women had the highest remaining life expectancy at age 60, compared with an average of 23.9 years among all foreign women. Women from the former Yugoslavia (22.9 years), as well as from the countries bordering Germany (22.7 years), had the lowest values.

In age-specific analyses, foreigners from the former Yugoslavia displayed the highest age-specific mortality in the age groups from 60 to 84. The mortality ratio of Yugoslavians to Germans has clearly increased since 1995. However, foreigners from Asian states were also found to have lost their mortality advantage relative to the German population in the period from 1995 to 2005. This trend can be observed for all migrant groups, and may be attributed to the increasing socioeconomic inequality of migrants.

169

Table 4: Remaining life expectancy at age 60 of selected migrant groups, 2001/2005, Germany, Statutory Pension Insurance (GRV)

Neighbouring countries of Germany	Turkey	Former Yugoslavia	Former guest worker countries	Other European states	Africa	America	Asia	Other states	Germans
Men									
Deaths (60+)									
4,882	9,664	8,155	10,570	4,635	746	873	1,193	4.013	1,417,39
Remaining life expectancy at age 60 (Chiang-method), in years									
18.7	20.6	17.6	19.1	19.1	21.1	20.1	19.6	20.3	19.4
Women									
Deaths (60+)									
3,216	1,553	2,612	2,892	3,703	35	684	426	2,520	1,687,431
Remaining life expectancy at age 60 (Chiang-method), in years									
22.7	24.6	22.9	24.3	24.3	23.9	24.1	24.9	24.5	24.2

Source: Calculations based on data of the GRV: SUFRTBN00XVST06 - SUFRTBN04XVST06, SUFRTWF01XVST06, SUFRTWF01XVST06 - SUFRTWF05XVST06.

5. Conclusion

The present study represents a contribution to the ongoing examination of the dimensions, as well as the determinants, of the mortality differences between the migrant and German populations living in Germany. Generally, we find that the mortality of migrants and non-migrants in Germany follow systematically different patterns.

Using official statistics, we find that the mortality of foreigners is much lower than German mortality, but this result is due to poor data quality concerning migrant population stock and migrant deaths. Especially in the older age groups, the mortality of the foreign population appears to be very low, which suggests that the migrant population stock at higher ages is overestimated. Other databases therefore had to be considered in estimating levels of migrant mortality.

The Central Register of Foreigners (AZR) was used because this database provides more reliable data on the foreign population in Germany. In this database, foreigners are found to have a mortality level that is clearly higher than the values found in the official statistics. Analyses of certain migrant groups concluded that Asian and African migrants have the lowest mortality rates, which appears to indicate that these migrants may be benefitting more than other groups of migrants from the healthy-migrant effect. The finding that mortality rises with longer periods of residency lends credence to the argument that adaptation processes lead to a convergence of mortality patterns among foreign and German populations. The foreigners who were born in Germany were also shown to have above-average mortality, thus confirming the hypothesis that second-generation immigrants no longer benefit from the healthy-migrant effect.

In addition, data drawn from the Statutory Pension Insurance (GRV) system were used. According to this data, the mortality advantage of foreigners had disappeared in the period between 1995 and 2005. The detailed analysis of single migrant groups showed that migrants from the former Yugoslavia had especially high rates of mortality, which suggests that these migrants did not benefit from the healthy-migrant effect. However, additional factors may influence mortality more than the healthy-migrant effect, such as psychological stress suffered in the wake of the violence and cruelty of the Balkan conflicts from 1991 to 1995.

In sum, it is evident that the mortality differences between foreigners and Germans have diminished, even though age-specific and migrant group-specific disparities still persist. However, the determinants of migrant mortality could not be sufficiently established in this study. Nonetheless, data artefacts as a result of registration errors could be eliminated through the use of databases like AZR and GRV. These results further confirm that the mortality advantage in the period immediately after immigration (healthy-migrant effect) exists, but that it also lessens with longer lengths of stay, as social effects become more dominant. In terms of basic empirical

evidence, ongoing research is needed that looks more precisely at important determinants of migrant mortality in Germany (e.g., education, social status, working conditions and work intensity).

References

Abraido-Lanza, A.F./Dohrenwend, B.P./ Ng-Mak, D.S./ et al. (1999): The Latino mortality paradox: a test of the "salmon bias" and healthy migrant hypotheses. In: American Journal of Public Health 89, 1543-1548.

Altenhofen, L./ Weber, I. (1993): Mortalität der ausländischen und der einheimischen Bevölkerung in der Bundesrepublik Deutschland. In: Sozial- und Präventivmedizin 38, 222-230.

Aparicio, M.L./ Döhring, A./ Mielck, A./ et al. (2005): Unterschiede zwischen Aussiedlern und der übrigen deutschen Bevölkerung bezüglich Gesundheit, Gesundheitsversorgung und Gesundheitsverhalten. In: Sozial- und Präventivmedizin 50(2), 107-118.

Federal Office for Migration and Refugees (BAMF) (2008): Migrationsbericht 2007. Nürnberg: Federal Office for Migration and Refugees.

Becher, H./ Razum, O./ Kyobutungi, C./ et al. (2007): Mortalität von Aussiedlern aus der ehemaligen Sowjetunion. Ergebnisse einer Kohortenstudie. In: Deutsches Ärzteblatt 104(23), 1655-1661.

Bollini, P./ Siem, H. (1995): No real progress towards equity: Health of migrants and ethnic minorities on the eve of the year 2000. In: Social Science and Medicine 41, 819-828.

Chaturvedi, N./ McKeigue, P.M. (1994): Methods for epidemiological surveys of ethnic minority groups. In: Journal of Epidemiology and Community Health 48, 107-111.

Chiang, C.L. (1984): The Life Table and its Applications. Malabar: Krieger Publishing.

Coleman D.A. (1982): Demography of Immigrants and Minority Groups in the United Kingdom. London: Academic Press.

Collatz, J. (1989): Brennpunkte sozialer Ungleichheit bei der medizinischen Versorgung ausländischer Arbeitnehmer und Flüchtlinge in der Bundesrepublik Deutschland. In: Zeitschrift für Sozialreform 35(11/12), 682-696.

Collatz, J. (1994): Zur Realität von Krankheit und Krankheitsversorgung von Migranten in Deutschland. In: Jahrbuch für kritische Medizin 23, 101-132.

Courbage, Y./ Khlat, M. (1996): Mortality and causes of death of Maroccans in France, 1979-91. In: Population: an English selection 8, 59-94.

Danesh, J./ Saracci, R./ Berglund, G./ et al. (2007): EPIC-Heart: The cardiovascular component of a prospective study of nutritional, lifestyle and biological factors in 520,000 middle-aged participants from 10 European countries. In: European Journal of Epidemiology 22(2), 129-141.

Deutsche Rentenversicherung Bund (2007): Codeplan SUF Demographie. Rentenbestand und Rentenwegfall 1993 – 2005. Deutsche Rentenversicherung Bund.

Dietzel-Papakyriakou, M. (1987): Krankheit und Rückkehr. Frühindividualität ausländischer Arbeitnehmer am Beispiel griechischer Rückkehrer. Berlin: Edition sigma.

Dinkel, R.H. (1989): Bevölkerungsdynamik. München: Vahlen.

Elkeles, T./ Seifert, W. (1993): Migration und Gesundheit. In: Sozialer Fortschritt 42(10), 235-241.

Elkeles, T./ Mielck, A. (1997): Entwicklung eines Modells zur Erklärung gesundheitlicher Ungleichheit. In: Gesundheitswesen 59, 137-143.

Fabian, T./ Straka, G.A. (1993): Lebenszufriedenheit älterer türkischer Migranten. In: Zeitschrift für Gerontologie 26, 404-409.

Fox, A.J./ Collier, P.F. (1976): Low mortality rates in industrial cohort studies due to selection for work and survival in the industry. In: British Journal of Prevention and Social Medicine 30, 225-230.

German Federal Statistical Office (2007): Fachserie 1, Reihe 2.2., Bevölkerung und Erwerbstätigkeit. Bevölkerung mit Migrationshintergrund, Ergebnisse des Mikrozensus 2005. Wiesbaden: German Federal Statistical Office.

Haas, W./ Brodhun, B./ Starker, A. (2006): Tuberkulose. Gesundheitsberichterstattung des Bundes. Heft 35. Berlin: Robert Koch-Institut.

Harding, S. (2000): Examining the contribution of social class to high cardiovascular mortality among Indian, Pakistani and Bangladeshi male migrants living in England and Wales. In: Health Statistics Quarterly 5, 26-29.

Heinzel, A. (2006): Volkszählung 2011: Deutschland bereitet sich auf den registergestützten Zensus vor. In: Berliner Statistik – Monatsschrift 7, 321-328.

Helmert, U./ Voges, W./ Sommer, T. (2002): Soziale Einflussfaktoren für die Mortalität von männlichen Krankenversicherten in den Jahren 1989 bis 2000. In: Gesundheitswesen 64, 3-10.

Hull, D. (1979): Migration, adaption and illness: a review. In: Social Sciences and Medicine 13A, 25-36.

Jasso, G./ Massey, D.S./ Rosenzweig, M.R./ et al. (2004): Immigrant Health – Selectivity and Acculturation. In: Labor and Demography 0412002. Economics Working Paper Archive. [Online: http://129.3.20.41/eps/lab/papers/0412/0412002.pdf.]

Kasl, S.V./ Berkman, L. (1985): Health consequences of the experience of migration. In: Annual Review of Public Health 4, 69-90.

Kentenich, H./ Reeg, P./ Wehkamp, K.H. (1984): Zwischen zwei Kulturen, was macht Ausländer krank? Berlin: Verlagsgesellschaft Gesundheit mbH.

Kibele, E./ Scholz, R./ Shkolnikov, V.M. (2008): Low migrant mortality in Germany for men aged 65 and older: fact or artifact? In: European Journal of Epidemiology 23(6), 389-393.

King, H./ Locke, F.B. (1987): Health effects of migration: U.S. Chinese in and outside the Chinatown. In: International Migration Review 21(3), 555-575.

Klein, T. (1993a): Soziale Position und Lebenserwartung. Eine kohortenbezogene Analyse mit den Daten des Sozio-Ökonomischen Panels. In: Zeitschrift für Gerontologie 26(5), 313-320.

Klein, T. (1993b): Soziale Determinanten der Lebenserwartung. In: Kölner Zeitschrift für Soziologie und Sozialpsychologie 45(4), 712-730.

Kliewer E.V. (1992): Epidemiology of diseases among migrants. In: International Migration, 141-164.

Kohls, M. (2007): Mobilität der Jugend in globaler Perspektive. In: Villanyi, D./ Witte, M./ Sander, U. (Hrg): Globale Jugend und Jugendkulturen. 113-126. Weinheim/ München: Juventa.

Kohls, M. (2008a): Erfassungsfehler, Healthy-Migrant-Effect und andere Schwierigkeiten bei der Analyse der Mortalität von Migranten – Eine Bestandsaufnahme. Nürnberg: Federal Office for Migration and Refugees.

Kohls, M. (2008b): Leben Migranten wirklich länger? Eine empirische Analyse der Mortalität von Migranten in Deutschland. Nürnberg: Federal Office for Migration and Refugees.

Kohls, M. (2008c): Mortality of Immigrants in Germany. Paper presented at European Population Conference 2008. Barcelona.

Kohls, M. (2009): Einfluss von Auswahlprozessen auf die Sterblichkeit verschiedener Zuwanderergruppen in Deutschland. In: DRV-Schriften 55(2008), 153-175.

Korporal, J. (1990): Zur gesundheitlichen Situation der ausländischen Bevölkerung in der Bundesrepublik. In: Psychomed 2, 11-16.

Krueger, D.E./ Moriyama, I.M. (1967): Mortality of the foreign-born. In: American Journal of Public Health 57(3), 496-503.

Kouris-Blazos, A. (2002): Morbidity mortality paradox of 1st generation Greek Australians. In: Asia Pacific Journal Clinical Nutrition 11(S), 569-575.

Kurth, B.M./ Schaffrath-Rosario, A. (2007): Die Verbreitung von Übergewicht und Adipositas bei Kindern und Jugendlichen in Deutschland. In: Bundesgesundheitsblatt 50(5/6), 736-743.

Kyobutungi, C./ Ronellenfitsch, U./ Razum, O./ et al. (2005): Mortality from external causes among ethnic German immigrants from former Soviet Union countries in Germany. In: European Journal of Public Health 16, 376-382.

Lee, E.S. (1966): A Theory of Migration. In: Demography 3, 47-57.

Lechner, I./ Mielck, A. (1998): Die Verkleinerung des Healthy Migrant Effects: Entwicklung der Morbidität von ausländischen und deutschen Befragten im SOEP 1984 bis 1992. In: Gesundheitswesen 60, 715-720.

Local Health Office Nürnberg (1997): Stadtteilgesundheitsbericht Gostenhof. Zur Gesundheit von Kindern und Jugendlichen. Nürnberg.

Mammey, U. (1990): 35 Jahre Ausländer in der Bundesrepublik Deutschland – die demographische Entwicklung. In: Höhn, C./ Rein, D.B. (Eds.): Ausländer in der Bundesrepublik Deutschland. Boppard am Rhein. Boldt: 55-82.

Mammey, U./ Schwarz, K. (1995): The demographic characteristics of the immigrant population in Germany. In: Haug, W. et al. (Eds.): The demographic characteristics of immigrant populations. Council of Europe: 193-243.

Marmot M.G./ Adelstein, A.M./ Bulusu, L. (1984): Immigrant mortality in England and Wales 1970-1978. OPCS Studies of Medical and Population Subjects No. 47. London: HMSO.

Marmot, M.G./ Smith, G.D./ Stansfeld, S. et al. (1991): Health Inequalities among British civil servants: the Whitehall II study. In: Lancet 337, 1387-1393.

McMichael A.J. (1976): Standardized mortality ratios and the healthy worker effect: scratching beneath the surface. In: Journal of Occupational Medicine 18, 165-168.

Neumann, G. (1991): Todesursachenstatistik – Sterbetafeln. In: Deutsches Ärzteblatt 88, 722-723.

Omran, A.R. (1971): The epidemiological transition: A theory of the epidemiology of population change. In: Milbank Memorial Fund Quarterly 49, 509-538.

Oppolzer, A. (1986): Wenn Du arm bist, musst du früher sterben. Soziale Unterschiede in Gesundheit und Sterblichkeit. Hamburg: VSA-Verlag.

Palloni, A./ Arias, E. (2004): Paradox lost: explaining the Hispanic adult mortality advantage. In: Demography 41, 385-415.

Ravenstein, E.G. (1885): The laws of migration. In: Journal of the Royal Statistical Society 48, 167-227.

Razum, O./ Zeeb, H./ Gerhardus, A. (1998a): Cardiovascular mortality of Turkish nationals residing in West Germany. In: Annals of Epidemiology 8, 334-341.

Razum, O./ Zeeb, H./ Seval-Akgün, H./ et al. (1998b): Low overall mortality of Turkish residents in Germany persists and extends into a second generation: merely a healthy migrant effect. In: Tropical Medicine and International Health 3(4), 297-303.

Razum, O./ Zeeb, H. (1998): Epidemiologische Studien unter ausländischen Staatsbürgern in Deutschland: Notwendigkeit und Beschränkungen. In: Gesundheitswesen 60, 283-286.

Razum, O./ Zeeb, H./ Rohrmann, S. (2000): The ‚healthy migrant effect' – not merely a fallacy of inaccurate denominator figures. In: International Journal of Epidemiology 29, 191-192.

Razum, O./ Rohrmann, S. (2002): Der Healthy-migrant-Effekt: Bedeutung von Auswahlprozessen bei der Migration und Late-entry-bias. In: Gesundheitswesen 64, 82-88.

Razum, O./ Twardella, D. (2002): Time travel with Oliver Twist – Towards an explanation for a paradoxically low mortality among recent immigrants. In: Tropical Medicine and International Health 7(1), 4-10.

Razum, O./ Geiger, I./ Zeeb, H./ et al. (2004): Gesundheitsversorgung von Migranten. In: Deutsches Ärzteblatt 43, 2882-2887.

Razum, O. (2006): Migration, Mortalität und der Healthy-Migrant-Effekt. In: Richter, M./ Hurrelmann, K. (Eds): Gesundheitliche Ungleichheit - Grundlagen, Probleme, Perspektiven. Wiesbaden: VS Verlag, 255-270.

Richter, A. (2006): Einzeldaten der Bevölkerungsstatistik – Die natürliche Bevölkerungsbewegung in Deutschland. In: Statistisches Monatsheft Baden-Württemberg 12, 11-16.

Robert-Koch-Institut (RKI) (2008): Schwerpunktbericht: Migration und Gesundheit. Robert-Koch-Institut: Berlin.

Roloff, J. (1997): Die ausländische und deutsche Bevölkerung in der Bundesrepublik Deutschland – ein bevölkerungsstatistischer Vergleich. In: Zeitschrift für Bevölkerungswissenschaft 22(1), 73-98.

Ronellenfitsch, U./ Kyobutungi, C./ Becher, H. et al. (2006): All-cause and cardiovascular mortality among ethnic German immigrants from the Former Soviet Union. In: BMC Public Health 6(16).

Rothenbacher, D./ Bode, G./ Berg, G./ et al. (1998): Prevalence and determinants of Helicobacter pylori infection in preschool children: a population-based study from Germany. In: International Journal of Epidemiology 27, 135-141.

Salzmann, T./ Kohls, M. (2006): Mortalitätsanalyse mit den Daten der Deutschen Rentenversicherung – Methodische Überlegungen zum Stichprobencharakter. In: DRV-Schriften 55, 185-199.

Schenk, L. (2002): Migrantenspezifische Teilnahmebarrieren und Zugangsmöglichkeiten im Kinder- und Jugendgesundheitssurvey. In: Gesundheitswesen 64(S1), 59-68.

Schenk, L. (2007): Migration und Gesundheit – Entwicklung eines Erklärungs- und Analysemodells für epidemiologische Studien. In: International Journal of Public Health 52(1), 87-96.

Schimany, P. (2003): Die Alterung der Gesellschaft – Ursachen und Folgen des demographischen Umbruchs. Frankfurt: Campus.

Schimany, P. (2007): Migration und demographischer Wandel. Forschungsbericht 5. Nürnberg: Bundesamt für Migration und Flüchtlinge.

Scholz, R.D. (2005): Differentielle Sterblichkeit in der GRV: Problemaufriss und erste Berechnungen. In: DRV-Schriften 55, 253-266.

Settertobulte, W. (2005): Gesundheitliche Lage und Risikoverhalten bei Jugendlichen aus Migrantenfamilien. In: Marschalck, P./ Wiedl, K.H. (2007): Migration und Krankheit. Göttingen. VR unipress, 171-188.

Shkolnikov, V.M./ Andreev, E./ Anson, J./ et al. (2004): The peculiar pattern of mortality of Jews in Moscow, 1993-95. In: Population Studies 58, 311-329.

Shuval, J.T. (1982): Migration and stress. In: Goldberger, L./ Breznitz, S. (Ed): Handbook of stress: Theoretical and clinical aspects. New York: Free press. 641-657.

Siahpush, M./ Singh, G.K. (1999): Social integration and mortality in Australia. In: Australian and New Zealand Journal Public Health 23, 571-577.

Steinkamp, G. (1993): Soziale Ungleichheit, Erkrankungsrisiko und Lebenserwartung. Kritik der sozialepidemiologischen Ungleichheitsforschung. In: Sozial- und Präventivmedizin 38, 11-122.

Trovato, F./ Clogg, C.C. (1992): General and cause-specific adult mortality among immigrants in Canada, 1971 and 1981. In: Canadian Studies in Population 19(1), 47-80.

Turra, C.M./ Elo, I.T./ Kestenbaum, B./ et al. (2005): Is there a salmon bias effect? Mortality differentials by place of residence among primary social security beneficiaries in the United States, Working Paper.

United Nations (1998): Recommendations on Statistics of International Migration, Revision 1. Department of Economic and Social Affairs, Statistics Division: Series M, 58. New York: United Nations.

Voges, W. (1996): Ungleiche Vorraussetzungen der Langlebigkeit. Bestimmungsgründe für Mortalität im zeitlichen Verlauf. In: Zeitschrift für Gerontologie und Geriatrie 29, 1-5.

Weber, I./ Abel, M./ Altenhofen, L./ et al. (1990): Zur gesundheitlichen Lage der ausländischen Bevölkerung in der Bundesrepublik Deutschland: Erste Erkenntnisse. In: Projektgruppe Prioritäre Gesundheitsziele (Hrsg.): Dringliche Gesundheitsprobleme der Bevölkerung in der Bundesrepublik Deutschland. Baden-Baden: Nomos, 577-601.

Weitoft, G.R./ Gullberg, A./ Hjern, A./ et al. (1999): Mortality statistics in immigrant research: method for adjusting underestimation of mortality. In: International Journal of Epidemiology 28, 756-763.

Williams, R. (1993): Health and length of residence among South Asians in Glasgow: a study controlling for age. In: Journal of Public Health Medicine 15, 52-60.

Young, C.M. (1987): Migration and Mortality: the experience of birthplace groups in Australia. In: International Migration Review 21, 531-544.

Zeeb, H./ Razum, O./ Blettner, M. et al. (2002): Transition in cancer patterns among Turks residing in Germany. In: European Journal of Cancer 38, 705-711.

Zeeb, H. et al. (2004): Gesundheitliche Lage und Gesundheitsversorgung von erwachsenen Migranten – ein Survey bei der Schuleingangsuntersuchung. In: Gesundheitswesen 66, 76-84.

Zeeb, H./ Razum, O. (2006): Epidemiologische Studien in der Migrationsforschung – ein einleitender Überblick. In: Bundesgesundheitsblatt 49, 845-852.

Fertility of Female Immigrants in Germany

Susanne Schmid, Martin Kohls

1. Introduction

In Germany, the share of foreigners in the total population has grown almost con-tinuously from 1961 onwards. At the end of 2008, around 6.73 million persons of foreign nationality (including 3.3 million women) were registered in the country. Of increasing importance are "persons of migrant origin"[1], a group of 15.4 million people (including 7.6 million women), or 18.7 per cent of the total population (German Federal Statistical Office, 2008). One-third of the German population under age five is of migrant origin. Hence, for a country with fertility below replacement level and ongoing demographic ageing – like Germany – the relevance of the migrant population can be expected to increase (Coleman, 2006; Sobotka, 2008). However, despite the large size of the female migrant population in Germany and the significant fertility differences between German and foreign women, there are only a few analyses on the reproductive behaviour of female migrants. This may be due to the lack of adequate and available databases.

Because an awareness of past and present research on migrant fertility patterns is necessary for understanding and estimating future fertility trends, this paper seeks to provide an overview of the reproductive behaviour of female migrants in Germany. Thus, the migrant fertility hypotheses discussed in the literature are presented and the impact of migration on fertility is illustrated using a "post-migration fertility figure". The empirical part of the paper opens with a comparison of the fertility patterns of the immigrant and the non-immigrant populations in the former Fed-eral Republic of Germany from 1970 to 2005, based on official statis-tics. But the fertility patterns of immigrants differ according to their country of origin and the duration of stay in the receiving country. In order to address the complex topic of migrant fertility, additional databases are analysed, e.g., data from the Statutory Pension Insurance (GRV), the Central Register of Foreigners (AZR)

---

1 The term 'persons of migrant origin' "includes all persons who have migrated into the territory that constitutes today the Federal Republic of Germany since 1949 and all foreigners born in Germany as well as all German nationals born in Germany who have at least one parent who immigrated into Germany or who was born as a foreigner in Germany" (German Federal Ministry of the Interior 2008).

and the Sample Survey of Selected Migrant Groups in Germany (RAM). In the course of this research, it became apparent that fertility levels of migrant women vary according to the database consulted largely because of differences in definitions, data collection methods and the quality of data.

2. Theoretical considerations

Demographic research is showing an increasing interest in the reproductive behaviour of migrant women. There are competing views on the impact of migration on fertility. In this chapter, the migrant fertility hypotheses discussed in the literature are presented.

2.1 Definition of reproductive behaviour

In the view of the authors, reproductive behaviour comprises all attitudes, values, considerations and behavioural patterns related to human fertility; it results in a region-specific number of children per woman, and, therefore, a typical family size. Reproductive behaviour is embedded in the cultural norms and traditions of a region, as well as in its structural conditions (e.g., hierarchies, social class system, distribution of wealth). Thus, reproductive behaviour changes in the course of social development (Schmid, 1976; Höpflinger, 1997; Schmid, 2008). Further, the reproductive behaviour is based on a dyadic decision-making process, on a so-called "pair-interaction" (Beckmann, 1978; von Rosenstiel et al., 1986).

2.2 Hypotheses explaining the reproductive behaviour of female migrants

The research on migrant fertility focuses on the influence that a change of location and culture has on the fertility level, the timing of birth, and the birth intervals of first-generation migrants.[2]

Migrant fertility research can be divided into analyses of the reproductive behaviour of migrants in industrial countries, particularly in Northern America and European countries (Kahn, 1988, 1994; Stephen/Bean, 1992; Dinkel/Lebok, 1997; Mayer/Riphan, 2000; Kulu, 2006; Genereux, 2007; Milewski, 2007, 2008; Sobotka,

---

2 For analysing the impact of the migration process on fertility, only first-generation migrants will be considered.

2008), and in developing countries (Goldstein/Goldstein, 1981; Hervitz, 1985; Young, 1991; Lee 1992; Lee/Pol, 1993; Brockeroff/Yang, 1994; Lindstrom 2003).

Fertility research has used varied quantitative research measures to investigate to what extent the reproductive behaviour of female migrants is influenced by the migration process and the change in the socioeconomic setting. Among the factors that have been shown to influence the fertility of first-generation migrants are:

- The socialisation experiences in the country of origin (socialisation hypothesis),
- Individual characteristics of the female migrant (selection hypothesis),
- The motivation for migration (interrelation hypothesis),
- The circumstances of the migration process (disruption hypothesis)
- The experiences in the country of destination with increasing duration of stay (adaptation hypothesis).

Socialisation hypothesis
The socialisation (or assimilation) hypothesis states that migration does not affect fertility because values and norms acquired in childhood in the country of origin determine reproductive behaviour. Thus, the fertility of first-generation migrants remains similar to the childbearing behaviour in the country of origin. Supporters of the socialisation hypothesis can be found particularly in early studies on migrant fertility in industrialised countries (Goldberg, 1959; Freedman/Slesinger, 1961; Duncan, 1965; Rosenwaike, 1973; Stephen/Bean, 1992).

Selection hypothesis
The selection hypothesis asserts that migrants are a select group of people whose fertility differs from the fertility levels prevalent in their country of origin. Thus, their childbearing behaviour is from the beginning more similar to the fertility prevalent in the country of destination than to the fertility in the country of origin. According to this hypothesis, fertility is not influenced by local, but by group-specific or individual (e.g., education, occupation, family orientation) characteristics (Macisco et al., 1970; Hoem, 1975). The selection hypothesis has been mentioned in many studies (Myers/Morris, 1966; Goldstein/Goldstein, 1981), but has rarely been tested (Courgeau, 1989; Michielin, 2004; Kulu 2005).

Interrelation hypothesis
The interrelation hypothesis argues that migration cannot be the sole reason for higher fertility levels upon arrival in the receiving country. It is more likely that different events coincide with each other. Rising fertility levels right after immigration can rather be explained, for example, by the coincidence of migration and family formation (Mulder/Wagner, 1993). This hypothesis has been tested and

substantiated in relation to internal and international migrants (Andersson, 2004; Kulu, 2005; Lindstrom/Giorguli-Saucedo, 2007). Recent studies analysing the fertility increase immediately after marriage and family-formation migration concluded that migration influences fertility, but does not trigger the fertility change (Singley/Landale, 1998; Andersson, 2004).

Disruption hypothesis
The disruption hypothesis suggests that migration always means a break in the life history of a person and causes a delay of childbearing. Thus migration serves to lower fertility before and upon arrival in the receiving country. But this fertility decrease is seen as only temporary, and is not expected to influence the completed fertility of a woman (Goldstein, 1973; Carlson, 1985; White et al., 1995; Brockeroff 1995).

Adaptation hypothesis
The adaptation hypothesis assumes that the current socioeconomic conditions and cultural norms in the destination country have a greater influence on migrants' childbearing behaviour than the familial socialisation acquired in the country of origin. While socio-political entitlements and economic resources have immediate effects on migrants' reproductive behaviour, cultural norms have less influence because the adaptation to initially unknown norms and values takes a long time. The adaptation hypothesis has been tested and supported by many studies on fertility of rural-urban migrants in developing countries (Farber/Lee, 1984; Brockeroff/Yang, 1994) and in migration research regarding industrialised countries (Courgeau, 1989; Kulu, 2005; Genereux, 2007; Milewski, 2008).

2.3 Figure to explain migrant fertility

Using these migrant fertility hypotheses as a starting point, the following influences on migrant fertility can be identified:

• Aspects of the country of origin
The *socialisation hypothesis* refers to *the country of origin* because it states that migration does not affect fertility. Thus, values and norms acquired in childhood in the country of origin will continue to determine the reproductive behaviour in the destination country.

• Aspects of the (married) partners
The *selection hypothesis* can be applied to the *characteristics of (married) partners*, because it claims that migrants are a particular group in the country of origin

whose reproductive behaviour is, from the beginning, more similar to the fertility patterns prevalent in the destination country.

- The migration motive

The *interrelation hypothesis* refers to the *motives for migration*, because it argues that migration cannot be the sole reason for rising fertility levels upon arrival in the destination country. It is more likely that different events coincide with each other, e.g., migration and family formation

- The migration process

The *disruption hypothesis* relates to the *migration process*, because it suggests that migration always means a break in the life history of a person. Therefore, migration lowers the fertility before and upon arrival in the receiving country.

- Aspects of the country of destination

Finally, the *adaptation hypothesis* refers to the *country of destination* because it assumes that the socioeconomic situation and cultural norms in the destination country have increasing effects on migrant fertility.

From these hypotheses, it could be deduced that aspects of the country of origin and the destination country, aspects of the (married) partners, as well as the motives for migration and the migration process, influence the reproductive decisions of the couple in the destination country. The reproductive decision-situation again has an impact on reproductive behaviour, and, therefore, on fertility (Fig. 1).

Figure 1:   Deduction of determinats on post-migration fertility based on the five
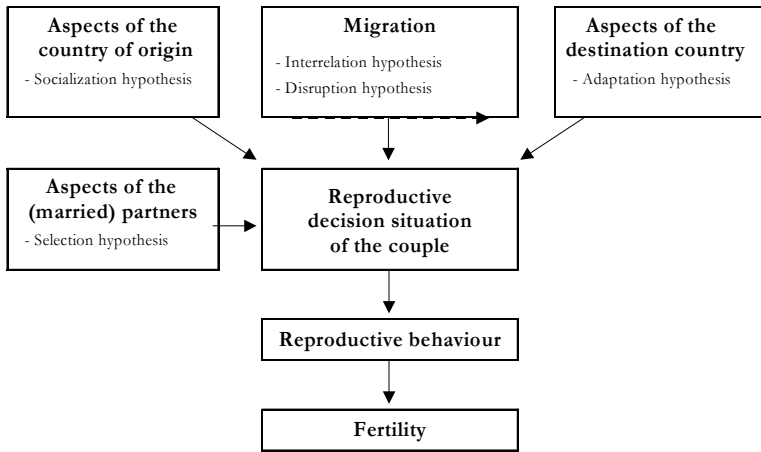hypotheses


```
┌──────────────────────┐  ┌──────────────────────┐  ┌──────────────────────┐
│ Aspects of the       │  │     Migration        │  │ Aspects of the       │
│ country of origin    │  │ - Interrelation      │  │ destination country  │
│ - Socialization      │  │   hypothesis         │  │ - Adaptation         │
│   hypothesis         │  │ - Disruption         │  │   hypothesis         │
│                      │  │   hypothesis         │  │                      │
└──────────────────────┘  └──────────────────────┘  └──────────────────────┘

┌──────────────────────┐  ┌──────────────────────┐
│ Aspects of the       │  │ Reproductive         │
│ (married) partners   │  │ decision situation   │
│ - Selection          │  │ of the couple        │
│   hypothesis         │  │                      │
└──────────────────────┘  └──────────────────────┘

                          ┌──────────────────────┐
                          │ Reproductive behaviour│
                          └──────────────────────┘

                          ┌──────────────────────┐
                          │     Fertility        │
                          └──────────────────────┘
```

Figure 2:   Post-migration fertility


```
┌──────────────────────────┐  ┌──────────────────────┐  ┌──────────────────────────────┐
│ Aspects of the country   │  │     Migration        │  │ Aspects of the destination   │
│ of origin                │  │ - Motives for        │  │ country                      │
│ - Cultural norms, values,│  │   migration          │  │ - Legal situation            │
│   attitudes              │  │ - Migration process  │  │ - Economic and political     │
│ - Economic and political │  │                      │  │   situation                  │
│   situation              │  │                      │  │ - Cultural norms, values,    │
│ - Influence of the       │  │                      │  │   attitudes                  │
│   (extended) family      │  │                      │  │ - Socio-economic status      │
│                          │  │                      │  │ - Influence of ethnic social │
│                          │  │                      │  │   networks                   │
└──────────────────────────┘  └──────────────────────┘  └──────────────────────────────┘

┌──────────────────────────┐  ┌──────────────────────┐
│ Aspects of the (married) │  │ Reproductive         │
│ partner                  │  │ decision-situation   │
│ - Socio-demographic      │  │ of the couple        │
│   aspects                │  │                      │
│ - Personal, familial and │  │                      │
│   social ressources      │  │                      │
└──────────────────────────┘  └──────────────────────┘

                              ┌──────────────────────┐
                              │ Reproductive behaviour│
                              └──────────────────────┘

                              ┌──────────────────────┐
                              │     Fertility        │      ┌──────┐
                              └──────────────────────┘      │ Time │
                                                            └──────┘
```

With increasing duration of stay – Change of the relevance of factors
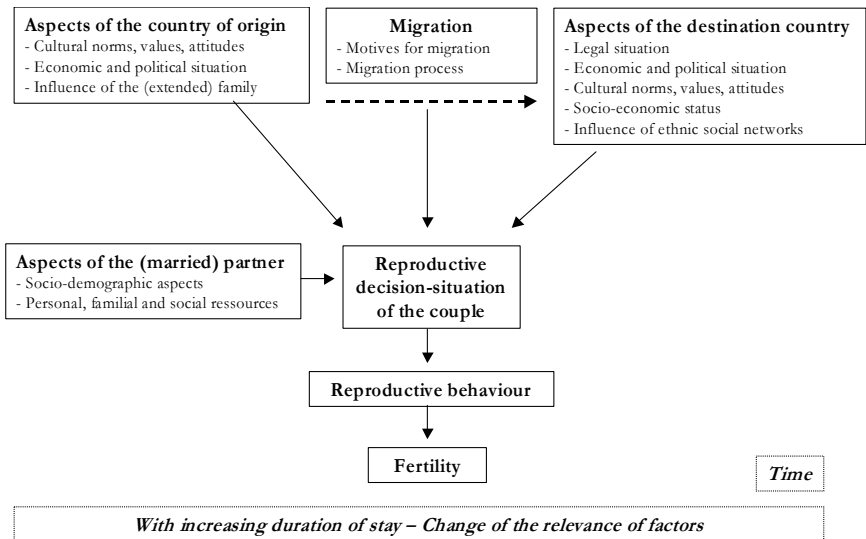
184

In the next step, based on the deduction of hypotheses (Fig. 1), we have constructed a "post-migration fertility figure" designed to clarify the interplay of factors which lead to a particular reproductive outcome among first-generation migrants (Fig. 2). According to the figure, post-migration fertility is influenced by (1) the socioeconomic and cultural norms and values of the country of origin, (2) the options and prom-ises of the country of destination, (3) the migration itself (a) based on the motives for migration (e.g., work migration, family reunification or asylum seeking) and (b) the circumstances of the migration process, and (4) the socio-demographic aspects of the (married) partners. With increasing duration of stay, the relevance of these factors will change. The determinants on migrant fertil-ity based on figure 2 will be specified in the following:

Aspects of the country of origin

- Cultural norms, values and attitudes

Cultural differences between countries become manifest in the respective attitudes towards children, the usual number of children und their significance for the lives of parents and families (socialisation hypothesis). However, particularly in the migration process, people become aware of their cultural attributes, such as religion, ethnicity, family systems and gender role models (Schmid, 2008).

- Economic and political situation

Modes of working and places of work (urban or rural) often determine marital status, family arrangements and the number of children. Agrarian societies show the highest number of children; post-industrial societies have the lowest (Schmid, 2008, 2010).

- Influence of the (extended) family

From the degree of modernisation in the country of origin, it is possible to draw conclusions about the extent to which reproductive behaviour – including the link between marriage and birth – is influenced by the individual partners, or by the extended family. The (extended) families of migrants from less-developed countries often have a greater influence on reproductive behav-iour (Caldwell/Caldwell, 1997; Genereux, 2007). However, as the duration of stay in the destination country increases, the influence of extended families may diminish.

- Legal situation: Residence law, nationality law

When choosing the destination country, the existence of migrant networks, as well as legal options for immigration and permanent residence, are relevant. In addition, laws related to residency and nationality can influence migrant fertility (Milewski, 2007; Genereux, 2007). Having an insecure residence status and the problems that may accompany this issue might lead to a postponement of birth. On the other hand, the anticipation of a birth might be favourable if the social legislation of the destination country improves the residence status of parents.

- Economic and political situation

Family policy benefits in the destination country, the availability of childcare services, the labour market situation, options for work-life balance, access to social security benefits and health care are important for promoting family formation (Kreyenfeld, 2002).

- Cultural norms, values and attitudes

With increasing duration of stay in the destination country, the norms, values and attitudes prevalent in the destination country exert more influence on the reproductive behaviour of migrant women (Milewski, 2007; adaptation hypothesis). Contact with natives normally accelerates the adaptation to the reproductive behaviour prevalent in the destination country. Therefore, for women migrating from high(er)-fertility countries to low(er)-fertility countries, a decline in fertility might be expected. In addition, the options for consumption in industrialised destination countries can hasten the adaptation process, and may promote a postponement or a limitation of births.

- Socioeconomic status

Many immigrants have to cope with "status inconsistency" with regard to their socioeconomic status in the destination country, i.e., the loss of social status relative to the status held in the country of origin. This could lead to emotional stress and depression, which may in turn have a negative impact on fertility. In contrast, the "minority status explanation" assumes a positive impact on fertility (Coleman 1994; Frank/Heuveline 2005).

- Influence of ethnic social networks

Immediately after immigration, migrants often seek contact with their compatriots and use ethnic networks to facilitate their orientation in the new socioeconomic setting (Wiley, 1970; Elwert, 1982). For that reason, migrant women who, for example, come from high(er)-fertility countries initially maintain the

behaviour and lifestyle of their country of origin, which includes a higher fertility level than that of the population in the low(er)-fertility country of destination. With the duration of stay and increasing contacts with natives, the adaptation of fertility patterns may occur (Nauck et al., 1997).

The absence of (extended) family members maintaining traditional role models might further the emancipation (in terms of education or occupation) of migrant women in the destination country. Emancipation may in turn have a fertility-reducing effect on the reproductive behaviour of migrant women from higher-fertility countries (Genereux, 2007).

Migration

• Motives for migration

Possible motives for migration include economic, educational or familial reasons, as well as displacement and the need for refuge. In connecting the migration motive with the expected reproductive behaviour of migrant women, it may be assumed that single migration (i.e., without a partner or as a single woman), work migration, educational migration and asylum migration might lower fertility. In contrast, marriage migration might increase fertility (interrelation hypothesis).

• Migration process

As mentioned in the disruption hypothesis, physical and psychological stress before and after the migration process might lead to a postponement of birth. It may be assumed, however, that this influence is only temporary.

Aspects of the (married) partners

• Socio-demographic aspects

Fertility is strongly influenced by the socio-demographic characteristics of each (married) partner (e.g., age, marital status, number of children). Our research results show, for example, that foreign women have a lower mean age at first birth than German women (Tab. 1, Tab. 3; Schmid/Kohls, 2008, 2010). If the partner of a migrant woman is native, the adaptation to the receiving country's fertility progresses more quickly than if her partner is a migrant too (Straßburger, 1998, 2003). The link between marriage and birth continues to be shaped by culture, and is unlikely to change.

• Number of children

The current number of children influences the reproductive behaviour of the (married) couple. Therefore, the desire to have an additional child decreases

with an increasing number of children (Pohl, 1995; Holzer/Münz, 1996). It will further decline if the couple has immigrated into a lowest low-fertility country.

- Personal, familial and social resources

The personal characteristics of partners, including their abilities and propensities, also influence the reproductive decision-situation of the couple (selection hypothesis). The personal, familial and social resources of the couple include the personality of the actors, socialisation experiences in the country of origin, family background (social class) and life goals, as well as attitudes towards children and parenthood, education and income.

Reproductive decision-situation of the couple

In addition to the values, norms and conditions in the destination country, the individual situation, the preferences of the individual actors and the couple as a whole play important roles in fertility (von Rosenstiel et al. 1986). As mentioned above, the reproductive decision situation, and, hence, the reproductive behaviour is influenced by all areas of society, including aspects of the country of origin and the destination country, the motives for and the process of migration, and the characteristics of the (married) partners (Fig. 2).

The relevance of various factors changes with increasing *duration of stay*. Close connections exist between the duration of stay and the degree of adaptation to the norms and values of the destination country.

3. Databases

The current research gaps in the field of migrant fertility in Germany are mainly the result of missing databases. Previous studies exclusively based on official statistics have been shown to contain errors, especially regarding migrant populations. In addition to the official statistics, there are further databases from administration and registers, as well as from social science surveys, which are suitable for migrant fertility analyses in Germany (Schmid/Kohls, 2010). These datasets are:

Administration and register data

Databases can be characterised as administration and register data when they are collected for a specific intention, and have a legal basis (e.g., census act, population statistic act). Furthermore, databases can also result from process-produced data when they are collected for another reason. In the Statutory Pension Insurance

system, for example, a large amount of data is collected in order to calculate the value of the pension, including data on parenting times. Databases from administration and registers are typically full samples with a large number of cases, which makes them very expensive. Therefore, the parameters of these databases are highly limited and mostly fulfil only the legal intention.

- Official statistics

The most important source for immigrant fertility analyses is the database contain-ing official birth statistics. Since 1970, registered births have been differentiated by nationality. However, only births that took place in Germany to women registered at the local registry offices are included (Richter, 2006). Nevertheless, this database is used most frequently when analysing migrant fertility in Germany, largely because it is suitable for carrying out trend analyses (see Kane, 1986; Mammey, 1990; Schwarz, 1996; Mammey/Schwarz, 2002).

- Microcensus

The Microcensus provides official representative statistics of the German population (former Federal Republic of Germany since 1957, the New *Laender* since 1991). In addition to socio-demographic and labour statistics, data on reproductive behaviour is collected. Thus it is possible to analyse differences between migrants and non-migrants, as well as differences between migrant groups. In addition, an innovative questionnaire concept was introduced in 2005, which allows for analyses of persons of migration origin (German Federal Statistical Office, 2007).

However, fertility analyses based on the Microcensus have been systematically distorted until now, because respondents were only asked about the number of births within the current marriage. For fertility analyses, all births to a woman, independent of the marital status, are generally required. After the revision of the Microcensus act in 2007, this gap in the data was closed.

- Statutory Pension Insurance (Gesetzliche Rentenversicherung, GRV)

Migrant fertility analyses based on Statutory Pension Insurance data can be undertaken because all relevant characteristics (e.g., age, sex, nationality, parenting time) are considered (Kreyenfeld/Mika, 2006; Schmid/Kohls, 2008). The GRV databases show a high validity because the registration status constitutes the basis for later pension claims (Scholz, 2005). Status changes – e.g., birth, death, immigration, emigration or unemployment – are therefore precisely documented. A disadvantage of the database is that the persons registered in the GRV do not represent the whole German population, because

certain groups, like civil servants, the self-employed and housewives[3], are not included.

- Central Register of Foreigners (Ausländerzentralregister, AZR)

All foreigners officially registered in Germany are recorded in the Central Register of Foreigners, including information about age, sex, nationality, date of immigration and registration status. Births are taken into consideration in the AZR, but only as a means of creating a completely new dataset. As a result, children cannot be tied to their parents, and thus migrant fertility analyses are not possible.

Data from social science surveys

In addition to administrative and register databases, which are collected to fulfil legal requirements, there are numerous scientific datasets. Data from social science surveys are usually characterised by restricted case numbers, but include a variety of variables.

- German Socioeconomic Panel (GSOEP)

The German Socioeconomic Panel, a survey started in 1984, is one of the most important databases in social research in Germany. The panel is designed as a longitudinal survey of private households. In 2006, 1,494 persons of foreign nationality were registered in GSOEP. Migrant fertility analyses are possible (see Nauck, 1987, 1988; Mayer/Riphahn, 2000; Milewski, 2007, 2008), but, due to restricted case numbers, the sample might not be representative for all migrant women in Germany.

- Sample Survey of Selected Migrant Groups in Germany (RAM)

The Sample Survey of Selected Migrant Groups in Germany (RAM) was carried out in 2006/2007 by order of the Federal Office for Migration and Refugees (BAMF). Respondents were persons of Turkish, Greek, Italian, Polish and Former Yugoslavian origin (Babka von Gostomski, 2008). Analyses of migrant fertility can be conducted based on that data. The initial results will be presented below (Chap. 4.2).

---

3 Housewives are included but tend to register not immediately after birth but years after because their right to a pension cannot expire and will be invoked later in life.

• Generation and Gender Survey (GGS)

In the first part of the Generation and Gender Survey (GGS), approximately 5 per cent of the interviewed persons were of non-German nationality (Ruckdeschel et al., 2006). This survey is designed as a follow-up survey to the Family and Fertility Survey, which was first carried out in 1992. Because of the low migrant sample, an additional sample of approximately 4,000 Turkish persons was drawn in 2006 (Ette et al., 2007). Generally, migrant fertility analyses of the largest migrant groups in Germany are possible, while estimates for the total migrant populations cannot be made. Migrant fertility analyses based on GGS data have yet to be conducted.

4. Empirical Results

The empirical results have been drawn from a demographic and sociological analysis of administration and register data, particularly of official statistics, the Central Register of Foreigners (AZR) and the Statutory Pension Insurance (GRV). A further data source used in the analysis is the Sample Survey of Selected Migrant Groups in Germany (RAM). Relying on these datasets, we posed the following research questions: To what extent does the fertility of German women differ from the fertility of migrant and foreign women? How large are the fertility differences between migrant groups in Germany? Which of the migrant fertility hypotheses is most influential?

4.1 Period fertility

Official statistics

In Tab. 1, fertility measures of German and foreign women between 1970 and 2005 are presented. The table shows that the number of births of German women fell sharply between 1970 and 1975, and was then stable until 1985. The higher number of births around 1990 (625,000) echoes the large size of the cohorts born 30 years previously who were then entering parenthoods. Thereafter, a steady decline to about 450,000 births in 2005 took place. With regard to foreign women, the data show a different trend. The number of births doubled from 1970 to 1975, and decreased until 1985. After 1985, the number of births rose to 125,000 in 2000, and again declined to about 111,000 births in 2005.

A common fertility measure for comparisons between population groups is the Total Fertility Rate (TFR). In 1975, the TFR of German women was 1,335 children per 1,000 women, while the rate among foreign women was 2,653 children per

1,000 women. Following a sharp decline until 1985, the TFR stabilised until 2005, when it reached 1,296 children per 1,000 German women, and 1,689 children per 1,000 foreign women (Tab. 1).

Table 1: Fertility measures of German and Foreign women*, 1970-2005, official statistics

|	1970	1975	1980	1985	1990	1995	2000	2005
Number of births								
Germans	754,028	493,690	527,481	520,753	625,116	561,044	530,970	449,518
Foreigners	56,658	106,708	93,051	65,312	101,969	120,237	124,701	110,504
Total Fertility Rate per 1,000								
Germans	1,996	1,335	1,368	1,248	1,366	1,242	1,328	1,296
Foreigners	2,109	2,653	2,363	1,673	2,177	1,810	1,866	1,689
Relation	0.95	0.50	0.58	0.75	0.63	0.69	0.71	0.77
Mean age at birth								
Germans	27.3	26.9	26.7	27.5	28.4	29.6	30.3	30.6
Foreigners	26.0	26.3	27.1	27.3	26.5	26.8	27.9	29.0
Difference	1.3	0.6	-0.4	0.2	1.9	2.8	2.4	1.6

*Births: Mothers' nationality.
Source: Own calculations based on data of the German Federal Statistical Office. 1970-2000: former Federal Republic of Germany (Old Laender). 2005: former Federal Republic of Germany (Old Laender) without Berlin.

As a further indicator of the reproductive behaviour, the mean age at birth is often used. Since 1980, the mean age at birth of German women had increased, and, in 2005, it reached its peak at 30.6 years. For foreign women, however, the mean age at birth fluctuated from 1970 to 1995 between 26.0 and 27.3 years. Only from 1995 onwards did the age continuously increase, and, in 2005, the mean age at birth was 29 years; i.e., 1.6 years lower than that of German women (Tab. 1).

When looking at the age specific fertility rates m(x) of German and foreign women in 1971, we can see that German and foreign women display nearly the same fertility patterns, with low rates of teenage fertility, and, from the age of 18 onwards, a sharp rise in fertility, with the highest rates seen in the age groups between 20 and 25 (Fig. 3). Furthermore, a steady lowering of age-specific fertility rates from the age of 25 onwards can be observed. In 2005, apparent differences between the fertility patterns of both foreign and German women come to the fore. Both groups have low teenage fertility rates, but, from the age of 18 onwards, the age-specific fertility rates of foreign women rise faster than the German ones. The highest age-specific fertility rates can be seen for foreign women between the ages

of 25 and 29, and for German women in the age group 29 to 32. Above the age of 35, German and foreign women have nearly identical rates (Fig. 3).

Figure 3:   Age-specific fertility rates of German and Foreign women*, 1971 and 2005, official statistics
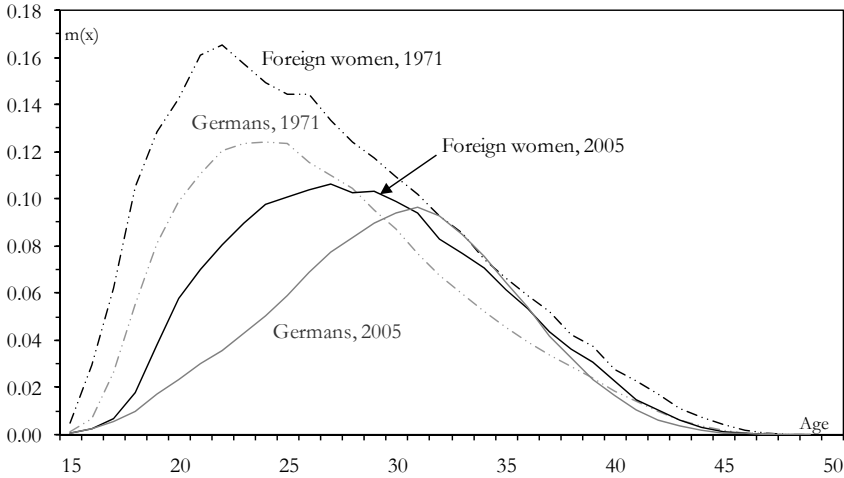
*Births: Mothers' nationality.
Source: Own calculations based on data of the German Federal Statistical Office. 1971: former Federal Republic of Germany (Old Laender). 2005: Old Laender without Berlin.

A comparison of the age-specific fertility rates of 1971 and 2005 shows fundamental changes in the fertility patterns of German and foreign women. Since 1971, the highest rates of fertility have shifted to considerably higher age groups (Fig. 3). While in 1971 the differences between German and foreign women could be explained by quantum differences, in 2005 the disparities are mainly caused by differences in the timing of births. Thus, foreign women continued to have a higher fertility rate than German women, but the TFR of foreign women declined steadily, from 2,653 per 1,000 in 1975 to 1,689 per 1,000 in 2005 (Tab. 1).[4]

---

4 Using data from the Central Register of Foreigners (AZR), a higher migrant fertility can be found because the population stock in the AZR is much higher than in the official statistics. Thus, in 2004-2006 foreign women show a TFR of 1,790 children per 1,000 women, which is about 6 per cent higher than in the calculation based on official statistics (see Schmid/Kohls, 2010).

Statutory Pension Insurance (GRV)

• All migrants

Another database adequate for analysing migrant fertility is the dataset of the Active Insured Persons 2002-2004 from the German Statutory Pension Insurance (Schmid/Kohls, 2008).[5] It includes women having credited times[6] in the GRV between 2002 and 2004. For our research, only women of the age cohorts from 1954 to 1991 have been considered, which amounts to 14.1 million German and 1.33 million foreign women.

Table 2: Number of births, 2002-2004, official statistics, Statutory Pension Insurance (GRV)

	Official statistics	**GRV**
Germans	1,758,622	1,544,847
Foreigners	372,971	213,395

Source: Official statistics and GRV (SUFAKVS04XVSBB).

Table 3: Fertility measures of German and Foreign women*, 2002-2004, Statutory Pension Insurance (GRV)

	2002-2004
Births, B$_t$	
Germans	1,544,847
Foreigners	213,395
Total Fertility Rate, TFR$_t$ per 1,000	
Germans	1,313
Foreigners	1,625
Relation	0.81
Mean age at birth, ∅x$_t$, years	
Germans	30.5
Foreigners	29.6
Difference	0.9

*Births: Mothers' nationality.
Source: Own calculations based on data of the GRV (SUFAKVS04XVSBB).

---

5 For information on further datasets of the GRV which are generally suitable for migrant fertility analyses, see Kreyenfeld and Mika 2006.
6 "Anrechnungszeiten".

We have tested the representativeness of the GRV database by checking it against the official birth statistics for 2002-2004 (Tab. 2). Compared to the official statistics, only 87.8 per cent to the births of German women and 57.2 per cent to the births of foreign women are included in the GRV dataset. Among the reasons for these large differences might be the lower employment rate of foreign women, and the failure of migrant women to register in the GRV (Schmid/Kohls, 2008, 2010). Between 2002 and 2004, foreign women (ages 15-49) are, at 1,625 children per 1,000 women, found to have a higher TFR than Germans in the same age group, at 1,313 children per 1,000 women (Tab. 3). In addition, the mean age at birth of foreign women is, at 29.6 years, lower than that of German women, at 30.5 years.

- Single migrant groups

Despite its under-coverage of foreign women, the GRV database will be used for fertility analyses because it allows us to differentiate between the reproductive behaviour of migrant groups by nationality, which cannot be done otherwise. Nonetheless, the underestimation of the births of foreign women must be kept in mind.

Selected fertility measures of female migrant groups are presented in Tab. 5 below. Because of the small number of cases, some nationalities had to be grouped (Tab. 4). The comparison of fertility measures of female migrant groups living in Germany shows major differences based on nationality (Tab. 5). With regard to the number of births, it is obvious that Turkish women have the highest percentage of all births among foreign women, at 33 per cent (69,250). The lowest share of all births to foreign women is found among American women, at around 3 per cent.

Table 4:   Female migrant groups

Neighbouring countries of Germany	Former Yugoslavia	Former guest worker countries	Other European states	Other states
- Belgium - Denmark - France - Luxembourg - The Netherlands - Austria - Switzerland	- Bosnia - Herzegovina - Croatia - Slovenia - Serbia - Montenegro - Macedonia	- Greece - Italy - Portugal - Spain	- Other European States without Turkey	- Australia - Oceania - Stateless - Ambiguous - Not specified

Table 5:   Fertility measures of migrant groups*, 2002-2004, Statutory Pension Insurance (GRV)

| Neighbouring countries of Germany	Turkey	Former Yugosla-via	Former guest worker countries	Other European states	Africa	America	Asia	Other States	Comparison Germany
Number of births									
9,975	69,250	24,452	23,060	35,065	10,905	5,966	26,654	8,068	1,544,847
Total Fertility Rate per 1,000									
1,071	1,832	1,641	1,299	1,372	2,218	1,686	1,936	1,694	1,313
Mean age at birth									
31.8	28.8	28.9	30.1	29.9	30.8	31.1	29.9	29.2	30.5

*Births: Mothers' nationality.
Source: calculations based on data of the GRV (SUFAKVS04XVSBB).

African women, at 2,218 children per 1,000 women, have the highest total fertility rates, followed by Asian (1,936) and Turkish women (1,832). TFRs of between 1,600 and 1,700 children per 1,000 women are seen among women from Former Yugoslavia (1,641), America (1,686) and other states (1,694). TFRs similar to those of German women (1,313) are found among women from former guest worker countries (1,299) and other European states (1,372). Women from countries that border Germany have the lowest TFR (1,071) (Tab. 5). The lowest mean age at birth is, at 28.8 years, found among Turkish women; while the highest mean age at birth is, at 31.8 years, seen among women from countries that border Germany. African women have, at 30.8 years, a surprisingly high mean age at birth – even higher than the German mean age of 30.5 years (Tab. 5).

The analysis of female migrant groups reveals major differences in fertility patterns (Fig. 4, Fig. 5). Turkish women have the highest age-specific fertility rates at younger ages, African women have higher rates over age 27. German women display, from the age of 32 onwards, higher age-specific fertility rates than Turkish women. African and Asian women have higher fertility rates than German women in all age groups (Fig. 4).

Women from Former Yugoslavia display fertility patterns similar to those of Turkish women. Particularly in the younger age groups, women from countries that border Germany have very low fertility rates – even lower than those of German women. But, at higher ages (above 35), women from countries that border Germany, as well as Americans, have higher rates than German women (Fig. 5).
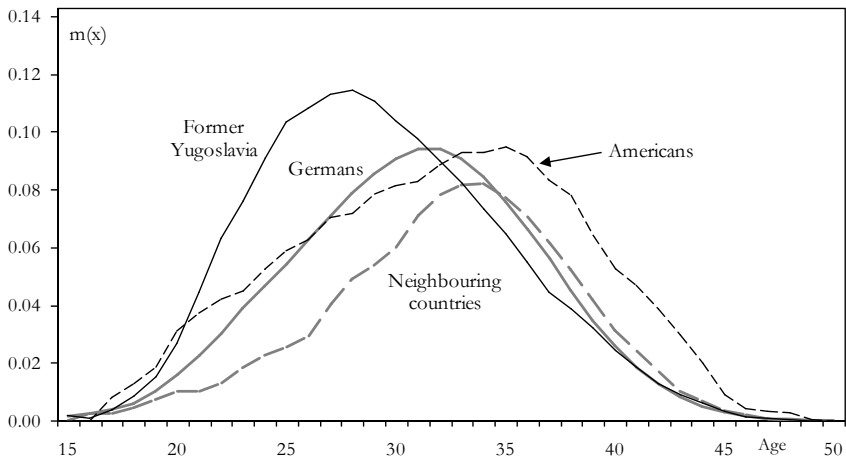
Figure 4:   Age-specific fertility rates of selected migrant groups*, 2002-2004,
                Statutory Pension Insurance (GRV)
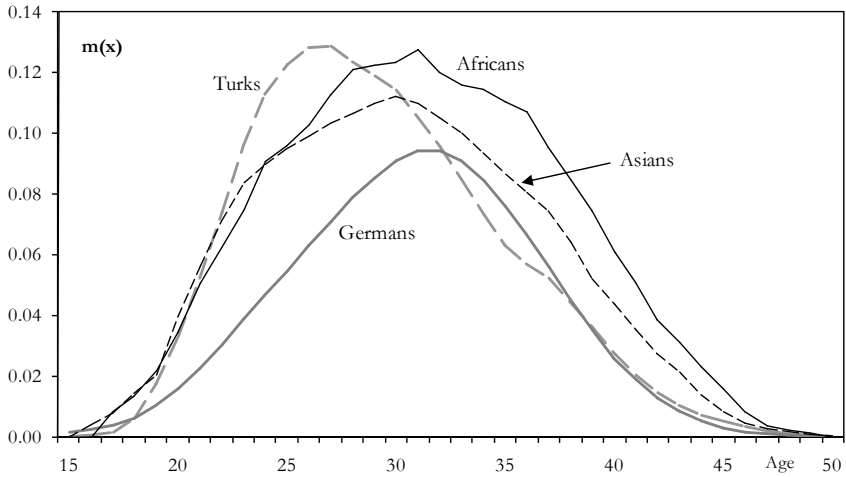
*Births: Mothers' nationality.
Source: Calculations based on data of the GRV (SUFAKVS04XVSBB).

Figure 5:   Age-specific fertility rates of selected migrant groups*, 2002-2004,
                Statutory Pension Insurance (GRV)

*Births: Mothers' nationality. Source: calculations based on data of the GRV (SUFAKVS04XVSBB).

After computing the TFR of foreign women with different databases, we have compared the results. The analyses show that, according to the data source in use, the TFR of foreign women in Germany varies in 2004 between 1,621 and 1,831 children per 1,000 women (Tab. 6). The highest deviations in the TFR have been found at younger (15-24) and higher ages (45-49). These variations have several causes. First, in the official statistics, only births that occur in Germany are considered. Second, only births to foreign women who are registered in the local registry office in Germany are taken into account. Third, the failure of emigrants to deregister leads to an overestimation of the female migrant population in Germany, and, hence, to an underestimation of the fertility of foreign women (Kohls, 2008; Schmid/Kohls, 2008, 2010).

In contrast, the AZR contains more valid data of the population stock of foreigners in Germany. Therefore, the total fertility rate of 1,831 children per 1,000 foreign women based on the population stock of the AZR might be more realistic. The relatively low TFR of 1,621 children per 1,000 foreign women based on the GRV is mainly due to the low employment rate of foreign women, and to the failed or delayed registration of foreign births in the GRV. Another reason for this low TFR might be the short duration of stay of foreign women, and their lack of knowledge regarding the reporting procedure in Germany.

Table 6: Total Fertility Rate (TFR) of Foreign women*, 2004, Central Register of Foreigners (AZR), official statistics, Statutory Pension Insurance (GRV)

Total Fertility Rate, TFR_t per 1,000	
AZR	1,831
Official statistics	1,713
GRV	1,621

*Births: Mothers' nationality.
Source: Own calculations based on data of the German Federal Statistical Office, AZR, GRV (SUFAKVS04XVSBB).

4.2 Cohort fertility

Sample Survey of Selected Migrant Groups in Germany (RAM)

The representative Sample Survey of Selected Migrant Groups in Germany (RAM) was conducted in 2006/2007 on behalf of the Federal Office for Migration and

Refugees (BAMF). It comprises 4,576 respondents, including 2,233 women. The allocation of the sample by nationalities is as follows (Babka von Gostomski, 2008):

- 33.0 % Turkish women (total number: 738)
- 21.2 % Former Yugoslavian women (473)
- 18.7 % Polish women (418)
- 13.8 % Greek women (309)
- 13.2 % Italian women (295)

Based on RAM, the main indicators of the post-migration fertility figure (see Chap. 2.3) can be empirically analysed for specific migrant groups:

- Birth cohort
- Nationality of the migrant women
- Nationality of her partner
- Partnership status
- Marital status
- Realised fertility (country of origin/destination)
- Religious affiliation
- Religiosity
- Level of education (years of school attendance)
- Occupation
- Native language skills
- German language skills
- Emotional ties to the country of origin
- Emotional ties to Germany
- Duration of stay in the destination country (years)

Our analysis focuses on the Completed Fertility Rate (CFR), which represents the number of children per 1.000 women in the cohorts of women reaching the end of their childrearing years. The comparison of the CFR by country of origin shows that women over age 40 who come from Turkey have, at 3,472 children per 1,000 women, the highest fertility rate (Tab. 7). By contrast, women from Poland have the lowest CFR, at 1,532 children per 1,000 women. In sum, the fertility of migrant women varies widely depending on their country of origin.

Table 7: Cohort Fertility Rate (CFR) of migrants* by country of origin, 2006/2007, Sample Survey of Selected Migrant Groups in Germany (RAM)

Country of origin	CFR, per 1,000	Total numbers
Turkey	3,472	286
Italy	2,268	144
Former Yugoslavia	2,094	222
Greek	2,068	158
Poland	1,532	148

*Only women of age 40+ are considered.
Source: Calculations based on RAM 2006/2007, weighted, n=958.

Tab. 8 shows that the cohort a migrant woman belongs to and the corresponding socialisation experiences have an impact on fertility. Women of the cohort 1927 to 1940 have the highest CFR, at 3,285 children per 1,000 women. The lowest CFR is found among women born between 1961 and 1965, at 2,280 children per 1,000 women. Furthermore, a close connection between marital status and fertility is maintained among migrant women. Thus, relatively few women have extramarital children (not shown here).

Table 8: Cohort Fertility Rate (CFR) of migrants by cohorts, 2006/2007, Sample Survey of Selected Migrant Groups in Germany (RAM)

Cohort	CFR, per 1,000	Total numbers
1927-1940	3,285	100
1941-1950	2,835	253
1951-1960	2,437	357
1961-1965	2,280	248

Source: Calculations based on RAM 2006/2007, weighted, n=958.

As noted previously in the theoretical discussion, the characteristics of the (married) partners also influence migrant fertility (see Chap. 2.3). In Tab. 9, we can see that the educational level (years of school attendance) has a strong impact on the completed fertility of a migrant woman. Thus, women with less than nine years of schooling have relatively high rates of fertility, at 2,761 children per 1,000 women; while women with longer records of school attendance (more than 12 years) have average rates of 1,653 children per 1,000 women. Our analysis of occupational status confirms the results discussed in the academic literature: women with higher levels of education clearly have lower rates of fertility than women with lower occupational levels (Kreyenfeld, 2002; German Federal Statistical Office, 2007).

Cohort Fertility Rate (CFR) of migrants* by years of school attendance, 2006/2007, Sample Survey of Selected Migrant Groups in Germany (RAM)

School attendance, in years	CFR, per 1,000	Total numbers
Less than 9	2,761	548
9-12	1,915	286
More than 12	1,653	68

*Only women of age 40+ are considered.
Source: Calculations based on RAM 2006/2007, weighted, n=902.

In addition, cultural aspects of the country of origin and the destination country, such as religious affiliation and religiosity should influence migrant fertility (see Chap. 2.3). Depending upon the nature of and the level of commitment to a religion, specific patterns of reproductive behaviour might be expected (Westoff/Frejka, 2007). The analysis shows that women belonging to one of the Muslim affiliations have the highest CFR, at 3,431 children per 1,000 women; while women belonging to other religious affiliations have, on average, about 2,000 children per 1,000 women. The religious affiliation of a migrant woman is strongly linked to her country of origin, and is therefore a reflection of the country. But the religious affiliation is an acquired parameter that does not dictate the religiosity of a person. Thus, RAM respondents were asked to evaluate their own religiosity. Women who describe themselves as religious or very religious had average fertility rates of 2,776 children per 1,000 women, while less religious women had average rates of 2,169 children per 1,000 women (not shown here).

Table 10: Cohort Fertility Rate (CFR) of migrants* by emotional ties to country of origin and country of destination, 2006/2007, Sample Survey of Selected Migrant Groups in Germany (RAM)

Level	Emotional ties to country of origin	Total numbers	Emotional ties to Germany	Total numbers
very strong	2,712	294	2,150	181
strong	2,763	314	2,371	446
neutral	2,492	233	2,417	272
little, not at all	2,575	117	3,000	62

*Only women of age 40+ are considered.
Source: Own calculations based on RAM 2006/2007, weighted, n=961.

In the course of adapting to the socioeconomic structures and conditions in the destination country, the reproductive norms and values of migrant women are

affected as well (adaptation hypothesis, Chap. 2.2). Thus, subject to the integration level, specific patterns of migrant fertility should become evident (Nauck, 1988, 2007). A migrant woman's status of integration can be measured by the level of her emotional ties to the country of origin, and to the destination country. In Table 10 we can see that the commitment to the county of origin has no measurable effect on migrant fertility. But the emotional ties to the destination country do appear to affect fertility: the higher the emotional ties to Germany, the lower the CFR. It is likely that women who have strong emotional ties to Germany are more integrated, and have therefore adapted to the norms and values of the destination country faster than less integrated women. This result corresponds with the findings of other studies (Nauck, 1988, 2007).

Finally, the nationality of the partner should have an impact on the fertility of migrant women (see Chap. 2.3). It is to be assumed that having a German partner promotes the adaptation process for migrant women because it offers more opportunities for regular contact with natives (adaptation hypothesis, Chap. 2.2). In RAM, only 20.5 per cent of migrant women (above age 40) living in a partnership have a German partner, but 79.5 per cent have a partner of non-German origin. Migrant women with a German partner have, on average, 1,821 children per 1,000 women, while couples of the same non-German nationality have significantly higher rates of fertility, or 2,824 per 1,000 women. The strongest influence of having a German partner on fertility can be observed for women from Former Yugoslavia: their CFR is 37.5 per cent lower if they have a German partner (not shown here).

In this chapter, only the most important empirical results of the cohort fertility of migrants could be presented. Additional factors determining migrant fertility will be considered in further empirical analyses based on RAM and other data sources (Schmid/Kohls, 2010).

5. Conclusion

This paper tried to provide a theoretical and empirical overview of the reproductive behaviour of female migrants in Germany. In addition, the findings of some past and present migrant fertility research were presented in an effort to improve our ability to understand and forecast future fertility patterns. Drawing upon the five migrant fertility hypotheses, the competing views concerning the impact of migration on fertility were discussed. Subsequently, the hypotheses were integrated in the "post-migration fertility figure" which the authors constructed to clarify the interplay of the factors that may be expected to lead to a particular reproductive outcome. Using this figure, we then constructed a basis for empirical analysis which includes the following potential determinants of migrant fertility: (1) the socioeconomic and cultural norms and values of the country of origin, (2) the options and

promises of the country of destination, (3) the migration itself (a) based on the motives of migration (like work migration, family reunification or asylum seeking) and (b) the circumstances of the migration process, and (4) the socio-demographic aspects of the (married) partners. With increasing duration of stay, the relevance of these factors might change.

After reviewing the available data sources, we have demonstrated that demographic and social research on migrant fertility in Germany has obvious deficiencies. These problems may be caused by gaps in the data as a result of incomplete statistical registration of immigrants. While the database of official birth statistics is broad and statistically significant, it contains categorical gaps and missing items that make it impossible to carry out, for example, detailed single nationality analyses. At the same time, there are a huge number of process-produced databases (e.g., GRV) and additional social science surveys (e.g., SOEP) which collect detailed information on nationalities or the origins of migrants, but which, due to restricted case numbers and selectivity, cannot be expected to produce significant results.

Looking at the empirical analyses based on GRV and on RAM, we can conclude that the fertility of female migrant groups is very heterogeneous. While migrant women from Africa, Turkey and Asia have high rates of fertility, women from countries that border Germany and from former guest worker countries have low rates of fertility.

Some determinants of migrant fertility based on the "post-migration fertility figure" could be analysed using RAM. Results showed that women with a German partner have a lower fertility than couples of the same non-German nationality because they have more contact with Germans, which promotes adaptation to the (low fertility) norms and values of the country of destination. The link between higher education and lower fertility could also be confirmed for migrant women. Furthermore, the reproductive behaviour of Muslim women is determined by their religious affiliation and levels of religiosity, which mostly reflect their socialisation experiences in the country of origin. For non-Muslim women, this link could not be ascertained. The fertility of migrant women declines with increasing levels of integration in the destination country. Thus, as the duration of stay in the destination country lengthens, the (socialised) aspects of the country of origin become less influential, while (adapted) aspects of the country of destination gain in importance.

Because there are competing hypotheses that seek to explain migrant fertility, further theoretical and empirical research aimed at advancing our understanding of whether and how migration influences the reproductive behaviour of migrant women is needed.

References

Andersson, G. (2004): Childbearing after migration: fertility patterns of foreign-born women in Sweden. In: International Migration Review 38(2), 747-774.

Babka von Gostomski, C. (2008): Türkische, griechische, italienische and polnische Personen sowie Personen aus den Nachfolgestaaten des ehemaligen Jugoslawien in Deutschland. Nürnberg: Federal Office for Migration and Refugees.

Beckmann, L.J. (1978): Couples Decision-Making Process Regarding Fertility. In: Taeuber, K.E./Sweet, J. (Eds.): Social Demography, New York, 57-81.

Brockeroff, M. (1995): Fertility and family-planning in African cities: the impact of female migration. In: Journal of Biosocial Science 27(3), 347-358.

Brockeroff, M./ Yang, X.S. (1994): Impact of migration on fertility in Sub-Saharan Africa. In: Social Biology 41, 19-43.

Caldwell, J.C./ Caldwell, P. (1997): Ursachen der Überbevölkerung Schwarzafrikas. In: Meusburger, P.: Anthropogeographie – Interdisziplinäre Grundlagen zu Bevölkerungswachstum und nachhaltiger Wirtschaft, Spektrum der Wissenschaft, 22-32.

Carlson, E.D. (1985): The impact of international migration upon the timing of marriage and childbearing. In: Demography 22, 61-72.

Coleman, D. (1994): Trends in fertility and intermarriage among immigrant populations in Western Europe as measures of integration. In: Journal of Biosocial Science 26: 107-136.

Coleman, D. (2006): Immigration and ethnic change in low-fertility countries: a third demographic transition? In: Population and Development Review 23(3), 401-446.

Courgeau, D. (1989): Family formation and urbanization. In: Population: An English Selection 44, 123-146.

Dinkel, R.H./ Lebok, U.H. (1997): The Fertility of Migrants before and after crossing the border. In: International Migration 35(2), 253-270.

Duncan, O.D. (1965): Farm background and differential fertility. In: Demography 2, 240-249.

Elwert, G. (1982): Probleme der Ausländerintegration. Gesellschaftliche Integration durch Binnenintegration? In: Kölner Zeitschrift für Soziologie und Sozialpsychologie 34, 717-731.

Ette, A./ Hullen, G./ Leven, I. et al. (2007): Generation and Gender Survey. Dokumentation der Befragung von türkischen Migranten in Deutschland. In: Materialien zur Bevölkerungswissenschaft, 121b, Wiesbaden: Federal Institute for Population Research.

Frank, R./ Heuveline, P. (2005): A crossover in Mexican and Mexican-American fertility rates: Evidences and explanations for an emerging paradox. In: Demographic Research 12, 77-104.

Farber, S.C./ Lee, B.S. (1984): Fertility adaption of rural-to-urban migrant women: a method of estimation applied to Korean women. In: Demography 21, 339-345.

Freedman, R./ Slesinger, D.P. (1961): Fertility differentials for the indigenous non-farm population of the United States. In: Population Studies 15, 161-173.

Genereux, A. (2007): A review of migration and fertility through the lens of African immigrant fertility in France. In: MPIDR Working paper WP 2007-008.

German Federal Ministry of the Interior (2008): Definition of "Persons of migrant origin". [Online: http://www.zuwanderung.de/nn_1120100/EN/ImmigrationToday/ImmigrationAZ/Functions/AZ_catalog,lv2=1123182,lv3=1085870.html.]

German Federal Statistical Office (2008): Fachserie 1, Reihe 2.2., Bevölkerung und Erwerbstätigkeit. Bevölkerung mit Migrationshintergrund, Ergebnisse des Mikrozensus 2007. Wiesbaden: German Federal Statistical Office.

German Federal Statistical Office (2007): Geburten in Deutschland. Wiesbaden: German Federal Statistical Office.

German Statutory Pension Insurance (2007): Codeplan Aktiv Versicherte 2002-2004, FDZ-RV - SUFAKVS04XVSBB.

Goldberg, D. (1959): The fertility of two-generation urbanities. In: Population Studies 12, 214-222.

Goldstein, S./ Goldstein, A. (1981): The impact of migration on fertility: an 'own children' analysis for Thailand. In: Population Studies 35, 265-281.

Goldstein, S. (1973): Interrelations between migration and fertility in Thailand. In: Demography 10, 225-241.

Hervitz, H.M. (1985): Selectivity, adaption, or disruption? A comparison of alternative hypotheses on the effects of migration on fertility: the case of Brazil. In: International Migration Review 19, 293-317.

Hoem, J.M. (1975): Fertility and out-migration: reflections on research approaches in empirical investigations of the association between two demographic phenomena. Working Paper 1. University of Copenhagen, Laboratory of Actuarial Mathematics: Copenhagen.

Höpflinger, F. (1997): Bevölkerungssoziologie: eine Einführung in bevölkerungssoziologische Ansätze und demographische Prozesse. Weinheim/München: Juventa.

Holzer, W./ Münz, R. (1996): Kinderwunsch in Österreich. In: Zeitschrift für Bevölkerungswissenschaft 21(1), 69 -102.

Kahn, J.R. (1988): Immigrant selectivity and fertility adaption in the U.S. In: Social Forces 67, 108-128.

Kahn, J.R. (1994): Immigrant and native fertility during the 1980s: adaption and expectations for the future. In: International Migration Review 28, 501-519.

Kane, T.T. (1986): The fertility and assimilation of guestworker populations in the Federal Republic of Germany: 1961-1981. In: Zeitschrift für Bevölkerungswissenschaft 12(1), 99-131.

Kohls, M. (2008): Healthy-Migrant-Effect, Erfassungsfehler und andere Schwierigkeiten bei der Analyse der Mortalität von Migranten – Eine Bestandsaufnahme. Nürnberg: Federal Office for Migration and Refugees.

Kreyenfeld, M. (2002): Time-squeeze, partner effect or self-selection? An investigation into the positive effect of women's education on second birth risks in West Germany. In: Demographic Research 7(2), 13-48.

Kreyenfeld, M./ Mika, T. (2006): Analysemöglichkeiten der Biografiedaten des „Scientific Use Files VVL 2004" im Bereich Fertilität und Familie. In: Deutsche Rentenversicherung, Bad Homburg: WDV, 9-10, 583-608.

Kulu, H. (2005): Migration and fertility: competing hypotheses re-examined. In: European Journal of Population 21(1), 51-87.

Kulu, H. (2006): Fertility of internal migrants: comparison between Austria and Poland. In: Population, Space and Place 12(3), 147-170.

Lee, B.S. (1992): The influence of rural-urban migration on migrant's fertility behavior in Cameroon. In: International Migration Review 26, 1416-1447.

Lee, B.S./ Pol, L.G. (1993): The influence of rural-urban migration on migrants fertility in Korea, Mexico and Cameroon. In: Population Research and Policy Review 12, 3-26.

Lindstrom, D.P./ Giorguli-Saucedo, S. (2007): The interrelationship of fertility, family maintenance, and Mexico-U.S. Migration. In: Demographic Research 17(28), 821-858.

Lindstrom, D.P. (2003): Rural-urban migration and reproductive behavior in Guatemala. In: Population Research and Policy Review 22, 351-372.

Mammey, U. (1990): 35 Jahre Ausländer in der Bundesrepublik Deutschland – die demographische Entwicklung. In: Höhn, C./ Rein, D.B. (Eds.): Ausländer in der Bundesrepublik Deutschland. Boppard am Rhein: Boldt, 55-82.

Mammey, U./Schwarz, K.(2002): The demographic characteristics of the immigrant population in Germany, in: Haug, W./ Compton, P./ Courbage, Y. (Eds.): The demographic characteristics of immigrant populations. Population Studies No. 38, Council of Europe, 193-244.

Macisco, J./ Bouvier, L.F./ Weller, R.H. (1970): The effect of labour force participation on the relation between migration status and fertility in San Juan, Puerto Rico. In: Milbank Memorial Fund Quarterly 48, 51-70.

Mayer, J./ Riphahn, R.T. (2000): Fertility assimilation of immigrants: Evidence from count data models. In: Journal of Population Economics 13, 241-261.

Michielin, F. (2004): Lowest low fertility in an urban context: the role of migration in Turin, Italy. In: Population, Space and Place 10, 331-347.

Milewski, N. (2007): First child of immigrant workers and their descendants in West Germany: Interrelation of events, disruption, or adaption? In: Demographic Research 17(29), 859-896.

Milewski, N. (2008): Fertility of Immigrants and Their Descendants in West Germany – An Event-history Approach. Doctoral thesis. Rostock: Max-Planck Institute Rostock.

Mulder, C.H./ Wagner, M. (1993): Migration and marriage in the life course: a method for studying synchronized events. In: European Journal of Population 9, 55-76.

Myers, G.C./ Morris, E.W. (1966): Migration and fertility in Puerto Rico. In: Population Studies 20, 85-96.

Nauck, B. (1987): Individuelle und kontextuelle Faktoren der Kinderzahl in türkischen Migrantenfamilien. In: Zeitschrift für Bevölkerungswissenschaft 13(3), 319-344.

Nauck, B. (1988): Dreißig Jahre Migrantenfamilien in der Bundesrepublik. Familiärer Wandel zwischen Situationsanpassung, Akkulturation, Segregation und Remigration. In: Nave-Herz, R. (Eds.): Wandel und Kontinuität der Familie in der Bundesrepublik Deutschland, Stuttgart: Enke, 315-339.

Nauck, B. (2007): Migrantenfamilien in Deutschland. Familiärer Wandel zwischen Situationsanpassung, Akkulturation, Segregation und Remigration. In: Zeitschrift für Familienforschung 19(1), 34-54.

Nauck, B./ Kohlmann, A./ Diefenbach, H. (1997): Familiäre Netzwerke, intergenerative Transmission und Assimilationsprozesse bei türkischen Migrantenfamilien. In: Kölner Zeitschrift für Soziologie und Sozialpsychologie 49(3), 477-499.

Pohl, K. (1995): Kinderwunsch und Familienplanung in Ost- und Westdeutschland. In: Zeitschrift für Bevölkerungswissenschaft 20(1), 67-100.

Richter, A. (2006): Einzeldaten der Bevölkerungsstatistik – Die natürliche Bevölkerungsbewegung in Deutschland. In: Statistisches Monatsheft Baden-Württemberg 12, 11-16.

Rosenstiel, L. von / Nerdinger, F.W./ Oppitz, G./ et al. (1986): Einführung in die Bevölkerungspsychologie. Darmstadt: Wissenschaftliche Buchgesellschaft.

Rosenwaike, I. (1973): Two generations of Italians in America: their fertility experience. In: International Migration Review 7, 271-280.

Ruckdeschel, K./ Ette, A./ Hullen, G./ et al. (2006): Generation and Gender Survey. Dokumentation der ersten Welle der Hauptbefragung in Deutschland. In: Materialien zur Bevölkerungswissenschaft, 121, Wiesbaden: Federal Institute for Population Research.

Schmid, J. (1976) Einführung in die Bevölkerungssoziologie. Reinbek: Rowohlt Verlag.

Schmid, S. (2008): Bevölkerungsentwicklung/-politik. In: Woyke, Richard (Ed.): Handwörterbuch Internationale Politik. Opladen, 39-51.

Schmid, S. (2010): Vor den Toren Europas? Das Potenzial der Migration aus Afrika. Forschungsbericht. Nürnberg: Federal Office for Migration and Refugees (forthcoming).

Schmid, S./ Kohls, M. (2008): Sind die FDZ-RV Daten für eine Analyse des generativen Verhaltens von Migrantinnen geeignet? In: Deutsche Rentenversicherung Bund (Eds.): Bericht vom 5. Workshop des Forschungsdatenzentrums der Rentenversicherung. In: DRV-Schriften, Band 55/2008, Berlin, 121-143.

Schmid, S./ Kohls, M. (2010): Beeinflusst Migration das generative Verhalten? Nürnberg: Federal Office for Migration and Refugees (forthcoming).

Schwarz, K. (1996): Die Kinderzahl der Ausländer und ihre Bedeutung für die Bevölkerungsentwicklung in den alten Bundesländern. In: Zeitschrift für Bevölkerungswissenschaft 21(1), 57-67.

Sobotka, T. (2008): The rising importance of migrants for childbearing in Europe. Overview Chapter 7. In: Frejka, T./ Sobotka, T./ Hoem, J.M./ Toulemon, L. (Eds.): Childbearing trends and policies in Europe. Demographic Research 19, 225-248.

Scholz, R.D. (2005): Differentielle Sterblichkeit in der GRV: Problemaufriss und erste Berechnungen. In: DRV-Schriften 55, 253-266.

Singley, S.G./ Landale, N.S. (1998): Incorporating origin and process in migration-fertility frameworks: the case of Puerto Rican women. In: Social Forces 76, 1437-1464.

Stephen, E.H./ Bean, F.D. (1992): Assimilation, Disruption and the fertility of Mexican-Origin Women in the United States. In: International Migration Review 26(1), 67-88.

Straßburger, G. (2003): Heiratsverhalten und Partnerwahl im Einwanderungskontext: Eheschließungen der zweiten Migrantengeneration türkischer Herkunft. In: Busch, F.W./ Nauck, B./ Nave-Herz, R. (Eds.): Familie und Gesellschaft. Bd. 10. Würzburg.

Westoff, C.F./ Frejka, T. (2007): Religiousness and fertility among European Muslims. In: Population and Development Review 33(4), 785-809.

White, M./ Moreno, L./ Guo, S. (1995): The interrelation of fertility and geographic mobility in Peru: a hazards model analysis. In: International Migration Review 29, 492-514.

Wiley, N.F. (1970): The Ethnic Mobility Trap and Stratification Theory. In: Rose, P.I. (Eds.): The Study of Society. New York, 397-408.

Young, C.M. (1991): Changes in the demographic behavior of migrants in Australia and the transition between generations. In: Population Studies 45, 67-89.

The dual demographic profile of migrants in Tuscany

Federico Benassi, Linda Porciani

1. Introduction

While migration from less developed countries (LDCs) has been well studied, migration from more developed countries (MDCs) has been virtually ignored, both in field research and in theoretical investigation. This chapter addresses this short-coming by analyzing the destination choices of foreigners from both areas of the world residing in Tuscany, a region in Centre Italy. A foreigner is defined as a person who does not have Italian citizenship and the MDC and LDC aggregations are the same as those used by the Italian National Statistical Institute (ISTAT, 2007). The LDC group represents Central and Eastern Europe (including the new European members, after May 2004)[1], Africa, Asia (with the exception of Israel and Japan) and Central and South America. By extension, stateless and displaced people have been included in this component. All other countries are included in the MDC group. Based on demographic analyses of foreigners from LDCs and MDCs in Tuscany, we demonstrate the dual demographic profile of migration and provide some challenges to the common notion of migration to more developed areas of the world.

The last census, conducted in 2001, is the source of data for mapping the distribution of foreigners by nationality in Tuscany. This data is the most recent one available that allows disaggregation by municipality, age, gender and region of origin. Readers should note that since 2001, the migratory situation in Italy has changed due to a law passed in 2002 (no. 189), which resulted in large scale legalization of undocumented migrants, and due to the addition of twelve new (relatively poorer) members to the European Union between 2004 and 2007.

The analysis presented in the following sections begins with a review of international migration theories, underlining that we know very little about movements from developed countries. The study then describes the spatial distribution of migrants in Tuscany at the municipality level, highlighting the dual demographic

---

1 Central and Eastern European Countries: Albania, Belarus, Bosnia-Herzegovina, Bulgaria, Croatia, Serbia and Montenegro, Macedonia, Moldavia, Romania, Russian Federation, Turkey, Ukraine, Czech Republic, Slovakia, Estonia, Latvia, Lithuania, Slovenia, Hungary, Cyprus. (ISTAT, 2007).

profile of migrants. This section is followed by a comparison made between the age and gender profiles of these migrants, and the Italian population as a whole. This analysis reveals some interesting insights for assessing the political and economic implications of the different types of migrants in Italy.

2. Theoretical framework: the lack of an integrated theory on migration flows

Migration theories are used to explain why people move across nations and borders. Theoretical approaches to the study of international migration can be divided into three areas: the macro, micro and meso approaches (Stalker, 2008). The macro approach focuses on the aggregate and structural levels of migration. The micro approach focuses on the individual decision making process. The meso approach is centered on the importance of social networks in migration behavior.

The structural perspective, or macro-approach, views the movements of populations determined by social, economic and political factors at the national level. According to this perspective, unemployment, relatively low wage rates and population pressure are seen as 'push' factors, driving emigrants from their homes and 'pulling' them to destinations with better conditions (Todaro, 1969). One of the best known structural explanations is the dual labor market theory (Piore, 1979). Here, capitalist development is argued to generate two distinct job types: those that require higher levels of skill and security to work in the capital intensive sector and those that require cheap, low-skilled persons to work in the labor intensive sector. The latter are often described as '3D' jobs: dirty, dangerous and difficult. Unsurprisingly, most native workers avoid 3D jobs, leaving a gap for foreigners to fill. Another important macro-approach for understanding migration patterns is the World Systems Theory outlined by Wallerstein (1974). This approach argues that current migration is a natural outgrowth of past colonialism and the global market economy (Massey et al., 1993: 444-448).

The micro approach to migration theory focuses on an individual's decision to migrate. Each individual may be considered a rational human being who assesses the possible benefits of migration, choosing the optimum combination of wage rates, job security, and travel costs (Borjas, 1990). An extension of the individual view is to consider the importance of the household in the decision making process. Here, the goal is not only economic gain but also a reduction in the risks to household income and well-being. In this co-insurance system, the family invests by supporting one of its own abroad in search for work. The migrant, in exchange, sends money home once work is found. This household theory of migration is sometimes called the 'New Economics of Migration' (Stark/Bloom, 1985).

The individual and structural perspectives may be combined into a meso-approach. Individuals or households cannot make decisions independently of the structures in which they find themselves. Nor do structures exist independently of individuals who themselves help create and reshape their political and economic environment. A clear example of a fusion between the two can be seen in migrant networks, through which pioneer migrants help those who follow them (e.g., spouses, siblings or persons from the same origin community) to settle and find work (Massey, 1990). The emergence of such networks suggests an even broader type of theory, a view that incorporates not just migrant networks and individual decision making but also includes other flows, such as those of capital and goods. This framework, in principle, could offer more insights into the integrated and complex nature of migration, particularly at the regional level.

The commonality of the three approaches described above is that they are all concerned with labor migration, most often from less developed to more developed countries. While the mechanisms of migration from more developed countries may be similarly thought of, it is less studied for two reasons: it involves a smaller number of persons and it (apparently) causes less concern for host countries.

To explain migration from MDCs to Italy, we need to examine the literature on retirement and amenity migration. A large part of the migration from more developed countries to Italy involves retirees (King/Patterson, 1998; Casado-Diaz et al., 2004; Bonaguidi/Terra Abrami, 1992). Another important group of migrants to Italy from more developed countries consist of individuals seeking a better lifestyle. These migrants typically come from big cities to live in a warmer, scenic and less crowded environment.

Finally, we consider three migrant types in this chapter: labour migrants, family reunion migrants and amenity migrants. Labor migrants in Italy tend to come from LDCs with age compositions that are substantially younger than that of the host country population. Family reunion migrants are people who have family ties to earlier emigrants. Many countries, including Italy, permit family reunion for migrants who are legal residents. Family reunion migrants tend to be women in their reproductive ages and children. Amenity migrants are people who are seeking to improve their lifestyle by choosing a destination with, say, a warmer climate, beautiful scenery and more relaxed atmosphere. Of these migrants, retirees stand out as being different because they can rely on a pension to live. Retirement migrants tend to move with their spouses and generally have high levels of education. They may also have a history of international mobility or tourism. Another group of amenity migrants are those termed *'Die Aussteiger'*, which means literally to "get off (the train)" or "get out." These are persons who make the decision to abandon a previous lifestyle, where they generally belonged to the upper-middle class, lived in big cities and led a relatively stressful existence. *Die Aussteiger* in Italy have a significant presence of single women in their reproductive ages. Both *Die*

Ausststeiger and retirement migrants view Italy and Tuscany, in particular, as a desirable place to live.

3. Foreign presence in Tuscany in recent years

Since the 1980s, Tuscany and other scenic places in Italy have been important places of destination for international migrants. This tendency has intensified over the last few decades (see Table 1). In 1981, the Italian census recorded 18 thousand foreign citizens in Tuscany and 210 thousand in Italy. In 2001, there were 109 thousand in Tuscany and 1.3 million in Italy. In comparison, Tuscany attracted relatively more migrants from MDCs than did Italy as a whole. As illustrated in Figure 1, the shape of the LDC lines shows the same trend for Italy and Tuscany, whereas the MDC lines differ, revealing a much greater intensity of migration to Tuscany.

Table 1:   Foreign migrants in Tuscany and Italy, 1981, 1991 and 2001

Year	Tuscany	% of total Tuscany population	Italy	% of total Italian population
1981	18,114	0.5	210,000	0.4
1991	45,414	1.3	356,159	0.6
2001	108,702	3.1	1,334,889	2.3

Source: ISTAT (various years).

On 1. January 2007, the resident foreign population in Tuscany was 234 thousand, that is 6.4 per cent of the total resident population in Tuscany, a higher prevalence than in Italy as a whole (6.2 per cent). The prevalence of foreign population in Tuscany on the total foreign population in Italy is 8 per cent. At the regional level, only five regions have higher prevalence: Lombardy (24.8 %), Veneto (11.9 %), Lazio (11.2 %), Emilia Romagna (10.8 %) and Piedmont (8.6 %). Today, Tuscany represents the region that exerts the greatest attraction in terms of migratory flows (ISTAT, 2007).

Figure 1:   Relative change in the foreign populations from LDCs and MDCs
(in %) residing in Tuscany and Italy, 2002-2006 (2002 = 100)
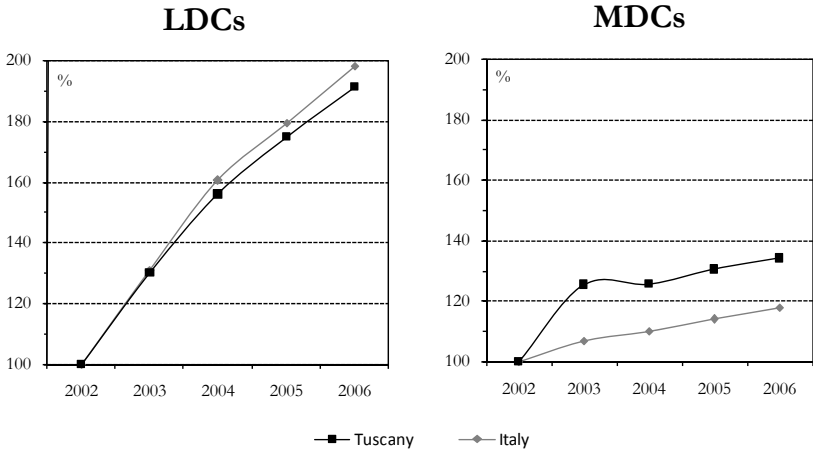
Source: Municipal register data from ISTAT.

The majority of migrants in Tuscany in recent years have originated from Central and Eastern European countries. In January 2007, they represented 54 per cent of the total resident foreign population in Tuscany (with 29 % being new European Union members). Albanians were the most numerous with 51 thousand (or 22 % of the total foreign population), followed by the Romanians with 28 thousand (or 12 % of the total foreign population). The Polish and Ukranian migrant populations have exhibited rapid gains in recent years. Another sizable migrant community consists of Chinese immigrants, who numbered 25 thousand or about ten per cent of the total resident foreign population of Tuscany. In general, East Asia, with more than 35 thousand foreign residents (15 % of the total foreign population) is the second major area of origin. The third area is North Africa (11.4 % of the total foreign resident population, many from Morocco). Among the top ten nationalities from MDCs, Germans ranked highest, with nearly 5 thousand persons or around two per cent of the total foreign population.

The spatial distribution of the foreign populations reveals differences according to area of origin (Beudò et al., 2008: 40ff). All of the provinces of Tuscany receive foreign migrants, but with different levels of intensity. Looking again at the 2007 data, the province of Florence exhibited the highest prevalence in its foreign population (32 %), followed by the Provinces of Prato (11 %), Arezzo (10 %) and Pisa

(9 %).[2] It is worth noting that the first three foreign communities of Tuscany (Albanian, Moroccan, Romanian) exhibit an even spread of their populations across this region. In contrast, the other communities show more focused concentrations. The Chinese population, for example, is concentrated in the Florence and Prato areas, where the economic sector of fashion and manufacturing plays an important role. Migrants from Senegal are concentrated in big cities and in the province of Pisa, due to the commercial sector, and in the Valdarno area, where the leather-working sector is very dynamic.[3] Migrants from MDCs have different spatial patterns of residence. German communities are located in area around Florence (23.6 %), in the rural areas of Grosseto (15.4 %) and in the province of Livorno (13.4 %).

4. Spatial distribution of the foreign population in Tuscany

Tuscany can be divided into twelve industrial districts, which are defined by a regional law in 2000.[4] Each of the twelve districts is considered a homogeneous area in terms of economic specialization, e.g., in the production of marble, paper, shoes and textile, leather goods, furniture or clothing goods.

The rest of the regional territory can be divided according to its physical geography: the coastal area (Versilia and Maremma), the island area (Archipelago), and a rural area called Chianti (a green area located between the provinces of Siena and Grosseto). Urban areas can also be identified as those with more than 50,000 inhabitants. These include the ten provincial capitals and Scandicci (province of Florence) and Viareggio (province of Lucca).

The distribution of the total number of migrants from LDCs, according to the 2001 Census, reveal that migrants from LDCs resided in a great number of municipalities. Their spatial distribution reveals three specific patterns: (1) those living in industrial districts, where the presence of migrants is connected to the labour demand; (2) those living in urban areas, such as Florence, Prato and the other provincial capitals, where demand for labour involves carers, cleaners and other employment in the low tertiary sector; and (3) those living in the coastal and archipelago

---

2 Provinces are administrative sub-regional areas including several municipalities. In Tuscany there are ten provinces and 287 municipalities.

3 The Valdarno Inferiore, located in the Arno valley in the eastern portion of the Province of Pisa and extending into the area around Florence, is a homogenous area with a high degree of industrialization and urbanisation.

4 Del. C.R. 69/ 2000 (Regione Toscana) Individuazione dei distretti industriali e dei sistemi produttivi locali manifatturieri ai sensi dell'art. 36 della Legge 317/1991 come modificato dall-art.6, comma 8, Legge 140/99.

areas, where the labour demand is essentially for seasonal jobs (e.g., restaurants and hotels).

The spatial distribution of migrants from MDCs shows a greater concentration in scenically and culturally attractive areas. These migrants are mainly resident in specific areas, such as Florence and its hinterland, the Chianti area (so-called "Chiantishire" in recent years due to the high presence of British migrants), coastal areas, the Isle of Elba, the areas east-west and south of Siena (but not in the city itself), the northern part of the Province of Lucca and southern Tuscany (especially the countryside between Arezzo and Grosseto). Finally, a large number of foreigners from developed countries are to be found in the three university cities of Pisa, Florence and Siena.

It is interesting to observe a similar distribution in King's (1998) research on the British community in Tuscany, based on sample survey data. The locations chosen by this community as their place of residence highlight a number of connections among the various motivations for migrating. These migrants respond to the search for an escape from the urban environment, and are sensitive to the attractions represented by the Tuscan climate and landscape, conceiving it as a form of escape from certain perceived aspects of the contemporary world. These motivations could be the same both for the *Aussteiger* and retired migrants.

In 2001, the foreign population in Tuscany represented 3.1 per cent of the total resident population. The two migrant groups played different roles: LDC migrants accounted for a large proportion (2.57 % for a total of 90,067 persons) and a small portion was due to MDC migrants (0.53 % for a total of 18,635 persons). Both LDC and MDC migrants exhibited the highest prevalence on resident population in the central part of southern Tuscany (> 10 %), where the native populations had declined and the population densities were low. In the recent past, these areas had suffered population decline as a consequence of rural-urban migration induced by urbanization (Pumain, 2005). In other words, migrants have offset the population decline in these areas. Moreover, when the migrants first arrived in Tuscany, they found a great availability of housing, due to the internal migration of local inhabitants who had moved to the industrial areas of the region, especially towards the Arno Valley. Thus, the early MDC foreigners bought these vacated properties for low prices. With the continued immigration from these areas, house prices then rose.

## 5. The age and sex compositions of the Italian and foreign populations from LDCs and MDCs

The large differences between the age and sex compositions of the Italian and all foreigners are shown in Figure 2 for Tuscany. The Italian population has a much

larger proportion of elderly people (especially female). The most numerous age group is of 35-39 years and the mean age is about 45 years. The percentage of elderly is 23 per cent and the ratio of elderly to children is about two elderly persons for every one child 0-14 years of age. The ratio of males to females in the population is 0.92. The foreign population, on the other hand, is a much younger population. Here, the most numerous age group is 30-34 years both for men and women and the mean age is 31.6 years. The percentage of elderly is only about four per cent. The male to female sex ratio is about the same at 0.93 (i.e., there are 93 males for every 100 females).

If we consider the two components of the foreign population separately, i.e. migrants from MDCs versus LDCs, the differences in the demographic profiles become even more pronounced (Figure 3). The foreign population from MDCs presents an older age structure, with a very small base of the pyramid, and a large predominance of females. However, it is interesting to underline that women are not concentrated in old age classes; indeed the most numerous age group is 35-39 with 1,862 persons. In the same age group, there are only 714 men. Overall, there are 12 thousand women and only 6.5 thousand males. The gender imbalance is difficult to explain beginning from the official data, but some reasonable hypotheses about the prevalence of women can be advanced. For instance, we know that "women live longer than men, and this factor assumes enhanced importance in a subpopulation with many retirement-age people and where men have married younger women. Secondly, more women are attracted to Italy and Tuscany: an interest in Italian language, literature and art appears to be more frequent amongst females" (King/ Patterson, 1998: 163ff). Furthermore, data from the naturalization show that there is a greater likelihood of foreign women marrying Italian men and then staying on to live in Italy. When an Italian woman marries a foreigner, it is more likely that the couple will relocate the residence abroad, given the unequal gender relations in marriage. There are no evidences in the literature of this kind of gender unbalance. It could be analyze in future research using qualitative methods (i.e. deep interview, focus group).

With regard to the demographic profile of these populations, the mean age of the MDC foreign population is about 44 years. The mean age of the LDC foreign population is 29 years. This population exhibits a much more balance profile in terms of its gender composition. The largest age group of women is in the 25-29 year old age group with 6,802 persons. For males, it is the 30-34 year old age group with 7,426 people. Overall, there are slightly more men than women, i.e., 45,911 persons versus 44,156 persons, respectively.

Figure 2: Relative population distribution by age and sex in Tuscany, 2001: Italians and Foreigners
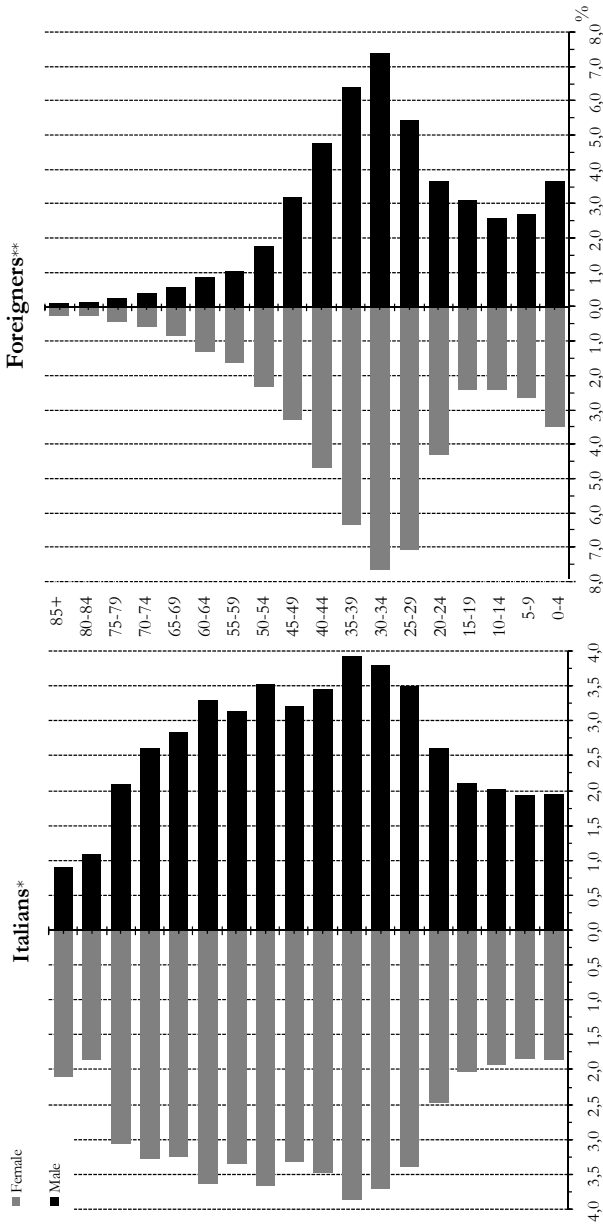
Source: ISTAT 2001, *relative to 3,389,104 Italians, **relative to 108,702 Foreigners.

218

Figure 3:   Relative population distribution by age and sex in Tuscany, 2001: Migrants from MDCs and LDCs
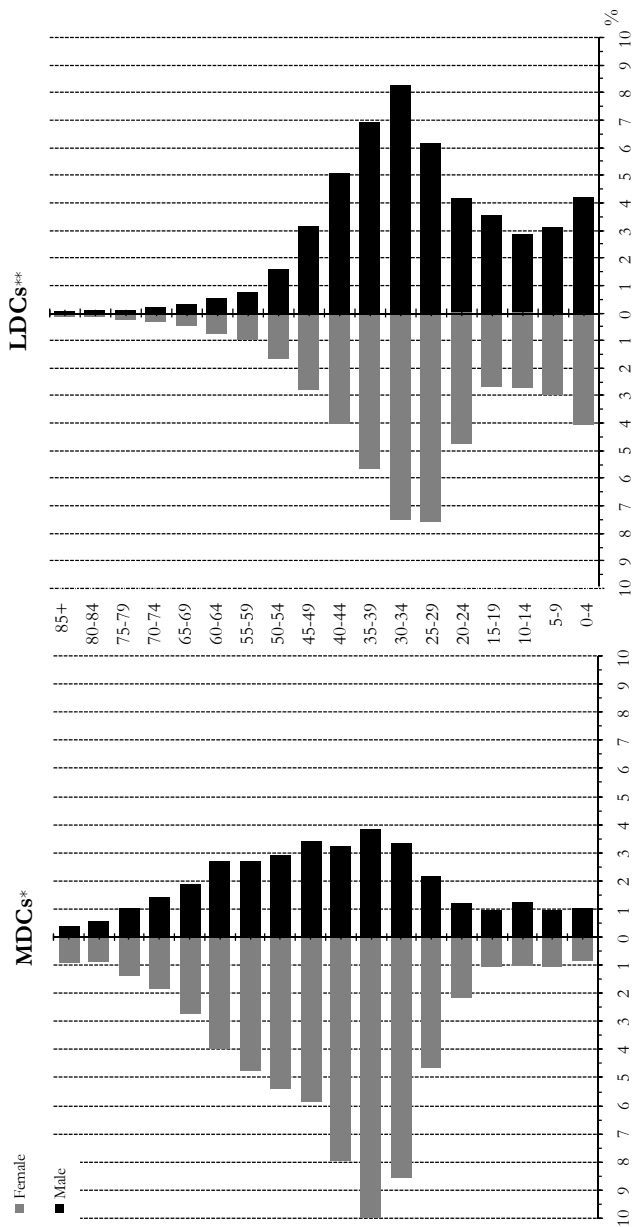
Source: ISTAT 2001, *relative to 18,635 migrants from MDCs, **relative to 90,067 migrants from LDCs.

The demographic indexes described above underline important aspects. The percentage of elderly in the MDC foreign population was 13 per cent. For the LDC foreign population, it was only 2 per cent. The male to female sex ratios were 0.53 for migrants from MDCs and 103 for migrants from LDCs.

In conclusion, the foreign populations in Tuscany from MDCs and LDCs present differential demographic profiles, not only in terms of spatial distribution but also with regard to their age and sex compositions. The degree of differentiation is so marked that the concept of a dual demographic profile appears fully warranted. But what are the reasons for this situation? And what does this situation imply for the structure of the total resident population (both Italian and foreign)?

6. Ethnic groups

In this section, we examine the origins of the most numerous communities amongst LDC and MDC migrants. This is important because the origin plays a major role in terms of social experience, cultural identity and demographic behaviour.

The analysis put forward here focuses only on the top ten nationalities for both LDCs and MDCs. The top ten account for more than 70 per cent of the total foreign population.[5] As illustrated in Table 2, the top three LDC communities are Albania, Morocco and China covering two thirds of the total LDC foreign population (i.e., 43 thousand persons out of 65 thousand persons) and the top three MDC communities are Germany, France and Great Britain covering more than one-half of the total MDC foreign population (9 thousand persons out of 16 thousand persons). As we observed with the total foreign populations, the number of females in the top ten MDC countries is higher than that of males, while the opposite is found in the top ten LDC countries. However, when we examine specific countries we see that Romanian, Polish and Filipino migrants have higher numbers of female migrants.[6]

Comparing the age structures of the largest foreign migrant groups, a dual demographic profile emerges with those from the top ten LDCs having a mean age of 29 years and those from the top ten MDCs having a mean age of 44 years. A noteworthy observation is that in the 0-4 year old age group of LDCs, there are more than 6,000 children, while for MDCs there are only 588 children. In terms of

---

5 The total population from LDCs is 90,067 units; the total population of the first ten nationalities is 64,756 (or about 72 %). The total population from MDCs is 18,635 units; the total population of the first ten nationalities is 16,192 units (about 87 %).

6 This can be explained by the work dimension of these migratory flows. It is well known that a large proportion of Polish, Romanian and also Philippino work in Italian families as cleaning ladies/butlers or as carers for old and oldest old people.

percentage of elderly (65+ years), the LDC migrant population has only 2 per cent versus 13 per cent for migrants from MDCs. The male to female sex ratios are also very different: 1.24 for the top ten LDC migrant groups versus a roughly 5 to 10 ratio for the top ten MDC migrant groups.

We now consider the demographic profiles of two ethnic groups: Albanians and Germans. These two communities have been chosen for three reasons. First, according to the 2001 Census data, they were the largest LDC and MDC ethnic groups, respectively, and they accounted for about the same percentage of both foreign migrant groups at around about 25 per cent each. Second, according to the 2007 population register data, they were still the largest ethnic groups. Finally, they provide a good illustration of the two main types of migration to Tuscany.

Table 2:   Foreign migrants from LDCs and MDCs in Tuscany by nationality and sex, 2001

LCDs	Male	Female	Total	MCDs	Male	Female	Total
Albania	13,217	9,658	22,875	Germany	1,575	2,788	4,363
Morocco	6,227	3,919	10,196	France	786	1,706	2,492
China	4,961	4,627	9,588	Great Britain	878	1,589	2,467
Romania	2,518	3,609	6,127	United States	761	1,199	1,960
Philippines	1,654	2,603	4,257	Switzerland	742	1,085	1,827
Jugoslavia	1,724	1,442	3,166	Spain	157	663	820
Senegal	2,712	310	3,022	Netherlands	246	420	666
Poland	446	1,475	1,921	Japan	158	447	605
Tunisia	1,191	678	1,869	Greece	253	245	498
Peru	1,147	588	1,735	Belgium	181	313	494
Total	**35,847**	**28,909**	**64,756**		**5,737**	**10,455**	**16,192**

Source: 2001 Census.

The spatial distribution of Albanians and Germans in Tuscany are markedly distinct from one another: Albanians have greater concentrations in the northern and northeastern parts of Tuscany, the more industrialized parts of the region, while Germans have greater concentrations in the coastal and island areas, and around Florence.

The age and sex compositions for Albanian and German migrants are set out in Figure 4. The Albanian age pyramid has large numbers of children and very few elderly. There is also a greater number of men in comparison to women and the young adult age groups are the most numerous. The German age pyramid, on the other hand, has few children and few elderly. The German migrant population, and

especially the female sector, is concentrated in the age groups 35-49 year old age groups.

The mean age of Albanians is about 26 years, while for Germans it is about 44 years. The percentage of elderly (65+ years) is about 2.2 per cent for the Albanian migrant population and about 12 per cent for the German population. It is quite evident that these two kinds of foreign population summarize the dual nature of the migration model that lies behind the choice to migrate.

The features of migrants from LDCs point to a type of labour dominant migration which can be explained by mostly economic factors, i.e., they are mostly young men migrating to the productive and labour intensive areas of Tuscany. The explanations for migrants from MDCs are more difficult to identify, such as the much higher numbers of women and similar age structure to the native population. The number of women from MDCs is double that of men and, furthermore, the number of women without partners (i.e., separated, divorced and widowed) is three times greater than that of men without partners, suggesting intentions to improve the conditions of one's life and well-being. These considerations appear to be corroborated in three field studies focusing on German communities in some subregional areas of Tuscany: the Isle of Elba, the Val di Cornia area and Lucca and its surroundings (Gemignani, 2002; Taddei, 2002; Crescenzi, 2000). The findings confirm an elderly age-structure of the population and a high presence of women.

The determinants of this form of migratory flow seem to be linked to personal conditions in the life of these migrants, i.e., they are persons who decided to move in order to break free from their previous life, in which they suffered a high level of stress attributable to living in big cities or to occupying a very high position in the job hierarchy. Their aspiration is to "get off the train", to go back to the roots of an older and more traditional lifestyle that is rural, warmer and less stressful. These data confirm the findings of King et al. (1998) in their study on British migrants in Tuscany in the early 1980s.

Figure 4:   Relative population distribution by age and sex in Tuscany, 2001: Migrants from Albania and Germany
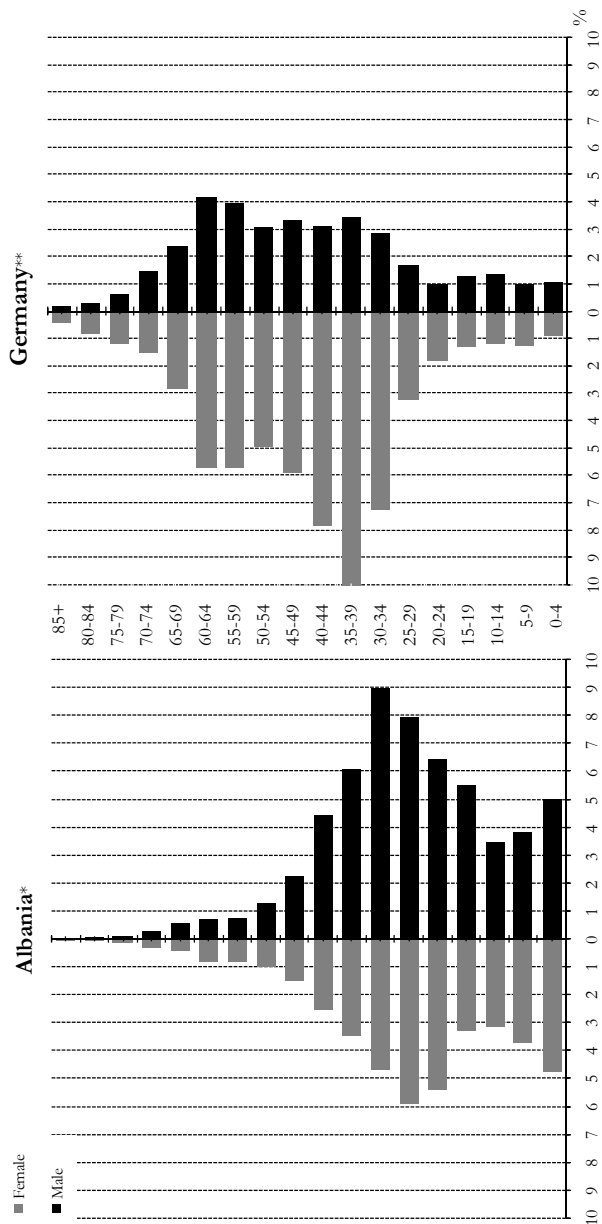
Source: ISTAT 2001, *relative to 22,875 migrants from Albania, **relative to 4,363 migrants from Germany.

7. Basic Conclusions

Tuscany presents a dual demographic profile in terms of migration. Migrants from LDCs are characterized by a labour profile: they have a young age structure with only a small proportion of elderly individuals (aged 65 and over), a great number of young people (0-14) and, above all, a very high density of people in the young adult age groups. Except for certain communities (i.e., Polish, Romanian and Filipino), the gender structure reveals a male dominance. The model that explains this kind of migration is well known: people move from one country to another essentially for economic and labour reasons. In contrast, individuals from MDCs present a very different demographic profile, not only in comparison to migrants from LDCs but also to the classical profile of migrants described in the literature. As we have shown in this chapter, MDC migrants have an older age structure as compared with migrants from LDCs. Gender composition reveals a dominance of women, particularly in the age groups between 35-44 years.

From these findings reported in this chapter, it is not easy to explain the demographic impacts of these two migrant populations on the Tuscan native population. This phenomenon cannot genuinely be classified as a migration of the elderly because the age structure is not one of advanced age: on the other hand, it is certainly not an economically driven migration. Although its nature has not yet been fully clarified, one may reasonably suppose that it may be a form of migration intermediate between migration of the elderly and that of the *Aussteiger* – a migration of persons who wish to "get off the train", escape from modernity and start a new life with better living conditions. Furthermore, it can be stated with some degree of certainty that a dual demographic profile of migration means a dual demographic effect on the native population. LDC migrants transfer new people with a younger age structure than the population of the host country. They also bring with them higher birth rates, as their origin communities tend to have a higher levels of fertility. Indeed, it has been recognized that immigration has become the driving force behind demographic change in many European countries, both directly and indirectly. For example, in Germany and Italy, immigration from LDCs prevents or moderates the decline in population. In other countries, such as in Belgium, Netherlands, Norway and Sweden, it has resulted in a considerable amount population growth (Coleman, 2006: 405). As we have seen, the migrant populations from outside Europe accounts for almost two thirds of immigrants. The natural increase in these populations is often greater than that of the native population, thanks in part to a younger age structure. The picture with regard to MDC migrants calls for a different set of considerations. From our data, migrants from developed countries could contribute to an aging of the native population, increasing the demand for social services, especially for the care of the elderly.

Future work could consider the degree of integration of these two types of migrants, in terms of their language acquisition, social relationships and segregation across space. The high levels of spatial concentration among migrants have been observed in several European countries - so much so, that some scholars have defined a new kind of city, the ethni-cities (Malheiros, 2002). Although in Tuscany, as well as in Italy as a whole, there are more than 100 different nationalities, data on the spatial distribution of migrants show that both migrants from LDCs and migrants from MDCs choose their residences in Tuscany according to their different needs. "Most cities are characterised by a dual spatial distribution of the ethnic groups, which separates the areas where non-EU groups are over-represented from the areas where 'whites' live, be they nationals or foreigners" (Malheiros, 2002: 119). Several factors could be suggested to explain the different residential patterns, among which, the most relevant are (1) the price of the housing where LDC migrants are disadvantaged by a system that prefers home ownership (the availability of rental accommodation is limited), (2) the existence of (or lack of) migrant networks and (3) the residential preferences of the declining and ageing native population (e.g., demand for care givers).

Finally, it is important to understand what the dual demographic profile of migration in Tuscany might imply in terms of policy or local planning. How can we define and manage these different types of migratory flows? Should migrants from the European Union be considered the same as international migrants from elsewhere?

Future researches could be focus specifically on migrants from MDCs to answer to these several "open questions". Tuscany, where the experience of migration from MDCs has reached a certain relevance, not only in terms of numbers, but also considering the economic and cultural impact of these migrants on local level, could be the laboratory to analyse this new migration in order to better understand the quantitative relevance of these migrants and the demographic effects on natives, the economic consequences of their arrival, the cultural importance of their presence, and their needs to better plan a social integration among native, migrants from less developed countries and migrants from more developed countries.

References

Beudò, M./ Giovani, F./ Savino, T. (2008): Dal lavoro alla cittadinanza: l'immigrazione in Toscana, Firenze: Irpet, Regione Toscana.

Bonaguidi, A./ Terra Abrami, V. (1992): The metropolitan aging transition and metropolitan redistribution of elderly in Italy. In: Rogers, A. (ed.): Elderly migration and population redistribution. London: Belhaven Press, 143-162.

Borjas, G. (1990): Friends or strangers: The impact of immigrants on the U.S. economy. New York: Basic Books.

Boswell, C. (2007): Theorizing migration policy: Is there a third way? In: International Migration Review 41(1), 75-100.

Caritas (2007): Immigrazione. Dossier Statistico 2007. XVII Rapporto, Pomezia: Idos.

Carling, J. (2008): Toward a demography of immigrant communities and their transnational potential. In: International Migration Review 42 (2), 449-475.

Casado-Diaz, M.A./ Kaiser, C./ Warnes, A.M. (2004): Northern European retired residents in nine southern European areas: Characteristics, motivations and adjustment. In: Ageing and Society 24(3), 353-381.

Caselli, G./ Vallin, J./ Wunsch, G. (2005): Demography. Analysis and synthesis - a treatise on population. Burlington, USA, Academic Press.

Coleman, D. (2006): Immigration and ethnic change in low-fertility countries: A third demographic transition. In: Population and Development Review 32(3): 401-446.

Gemignani, S. (2002): Le immigrazioni dai paesi dell'Europa nord-occidentale nella provincia di Lucca. Un'indagine empirica. Dissertation Thesis in Political Sciences, University of Pisa.

Crescensi, S. (2000): Gli immigrati in Italia dai paesi a sviluppo avanzato: una ricerca empirica nella Val di Cornia. Disseration Thesis in Political Sciences, University of Pisa.

Giovani, F./ Savino, T./ Valzania, A. (2005): Immigrati in Toscana. Occupazione e sicurezza sul lavoro e nell'industria diffusa, Firenze, Irpet.

ISTAT (2007): La presenza straniera in Italia: caratteristiche socio-demografiche, Roma, ISTAT

King, R./ Patterson, G. (1998): Diverse paths: The elderly British in Tuscany. In: International Journal of Population Geography 4, 157-182.

King, R./ Warnes, A.M./ Williams, A.M. (1998): International retirement migration in Europe. In: International Journal of Population Geography 4, 91-111.

Malheiros, J. (2002): Ethni-cities: Residential patterns in the northern European and Mediterranean metropolies - implications for Policy Design. In: International Journal of Population Geography 8, 107-134.

Massey, D. (1990): The social and economic origins of immigration. In: Annals of the American Academy of Political and Social Sciences 510, 60-72.

Massey, D./ Arango, J./ Hugo, G./ Kouaouci, A./ Pellegrino, A./ Taylor, E.J. (1993): Theories of international migration: A review and appraisal. In: Population and Development Review 19(3), 431-466.

Piore, M.J. (1979): Birds of passage: Migrants labour in industrial societies. Cambridge: Cambridge University Press.

Pumain, D. (2005): The urbanization process. In: Caselli, G./ Vallin, J./ Wunsch, G. (eds.): Demography. Analysis and synthesis - a treatise on population. Burlington, USA, Academic Press, 319-331.

Rodriguez, V./ Mayoralas, G.F./ Rojo, F. (1998): European retirees on the Costa del Sol: A cross-national comparison. In: International Journal of Population Geography 4, 183-200.

Rogers, A. (1988): Age patterns of elderly migration: An international comparison. In: Demography 25(3), 355-370.

Rogers, A. (1989): The elderly mobility transition: Growth, concentration and tempo. In: Research on Aging 11(1), 3-32.

Rogers, A. (1990): Return migration to region of birth among retirement age persons in United States. In: Journal of Gerontology: Social Sciences 45(3), 128-134.

Rogers, A. (1992): Elderly migration and population redistribution. London: Belhaven Press

Rogers, A./ Castro, L.J. (1981): Age patterns of migration: Cause-specific profiles. In Advances in Multiregional Demography, RR-81-6, International Institute for Applied Systems Analysis, Laxenburg, 125-159.

Stalker, P. (2008): The no/nonsense guide to international migration, New Internationalist 2nd edition, Clevaland

Stark, O./ Bloom, E. (1985): The new economics of labor migration. In: American Economic Review 75(2), 173-178.

Taddei, G. (2002): L'immigrazione straniera nell'Isola d'Elba. Il caso tedesco. Dissertation Thesis in Political Sciences, University of Pisa.

Todaro, M.P. (1969): A model of labor migration and urban unemployment in less developed countries. In: American Economic Review 59(1), 138-48.

Toulemon, L. (2004): La fécondité des immigrées: nouvelles données, nouvelle approche. In: Population et Sociétés 400, 1-4.

Wallerstein, I. (1974): The modern system, capitalism agriculture and the origins of the European world economy in the sixteenth century, Academic Press, New York

Immigrant Impact on Employment and Occupational Opportunities of Population in Britain[1]

Marina Shapira

1. Introduction

Migrants have a profound impact on the labour market of the country to which they move. They tend to be concentrated in particular localities, and in particular occupations and branches of industry. This concentration makes their presence in the local labour market very noticeable to non-migrant workers. There is a great deal of policy and public concern, often fanned by alarmist reporting in the media, that a large influx of migrant labour into the labour market will depress the wage levels of non-migrant workers, especially those with the same skill levels as migrants. Moreover, it is often anticipated that migrants will displace non-migrant workers in some occupations and industries, or push them out of the labour market altogether.

Since the late 1990s, Britain has experienced a dramatic increase in the number of migrants. The increase coincides with changes in immigration policy and the relative attractiveness of the United Kingdom's (UK's) economic position over the past decade. The increase in the rates of immigration from Eastern Europe since 2004 is in large part caused by the accession of the A8[1] countries into the European Union (EU) on 1 May 2004, where citizens from these nations obtained free movement and the right to work in the UK, Ireland and Sweden. Thus, the inflow of non-British EU citizens to Britain increased from 14,000 in 2003 to 74,000 in 2004 (Office for National Statistics, 2006) and citizens of the A8 countries made up an estimated four fifths of the increase. According to the Annual Population Survey in 2006, 30 per cent of all immigrants arriving in the UK since 2004 were of Eastern European origin, while among employed immigrants, the percentage of Eastern European immigrants was even higher and reached 40 per cent. At the same time there was also growth of immigration to the UK from countries outside the EU, especially from the New Commonwealth (Blanchflower et al., 2007).

---

1 A8 accession countries are eight out of ten countries which accessed European Union in 2004. These countries are Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia.

Although there have been studies in the UK that have examined the correlations between immigration from abroad and the labour market outcomes of UK workers, the evidence about the direction of the relationship is not clear. For example, Dustmann et al. (2005) examined the impact of the proportion of migrants who arrived before 2000 on the employment and wages of native-born Britons with different skill levels at the regional level and found little evidence of a negative effect of immigration on native workers' outcomes. Before that, a study for the Department for Education and Employment on the possible labour market impacts of Eastern European migrants predicted overall losses from unskilled migrants and overall gains from skilled migrants (Bauer/Zimmermann, 1999). More recently, Blanchflower et al. (2007) conducted a review of existing research on the impact of post 2004 immigrants on the UK labour market, finding that it is not possible to demonstrate a negative impact of immigration from A8 countries on the UK labour market. Gilpin et al. (2006: 49) also found no statistical evidence that A8 migrants are contributing to the rise of unemployment in the UK.

There have been some attempts to explain the absence of any sizable effect of migration from A8 countries on the labour market outcomes of British workers. For example, Frijters et al. (2005) found that immigrants do not effectively compete for jobs with natives, although the probability of success is likely to increase with the years since migration. Manacorda et al. (2006) found that natives and immigrants in the UK are imperfect substitutes, which is useful for explaining why the wage impact of immigration on natives is small. In sum, researchers on the labour market impacts of immigrants in the UK (and earlier in the USA) have spent a great deal of effort to reconcile the discrepancies between theoretical expectations and weak empirical evidence. The main conclusion from the USA research literature in late 1990s, reached by several distinguished labour economists, was that immigration provides, on average, a positive but small economic gain to non-migrant workers (Smith/Edmonston, 1997).

Research on the labour market impact of immigration faces many methodological challenges. In fact, the literature on these challenges is as vast as the literature about the topic itself (cf., LaLonde/Topel, 1992; Altonji/Card, 1991; Borjas et al., 1992; Borjas, 2005; Friedberg/Hunt, 1995; Cohen/Hsien, 2000; Dustmann, et. al., 2005; Friedberg, 2001; Cohen-Goldner/Paserman, 2005). The main reason for these difficulties is that the labour market outcomes of workers are determined by such a wide variety of factors that, only after identifying and accounting for all these factors (which is a very challenging task on its own), can one safely attribute the remaining spatial differences in workers' labour market outcomes to spatial variations in the size of immigrant populations.

This chapter investigates the impact of immigration on the local labour market outcomes of British-born workers, with particular attention to the differences in the effect of immigrants arrived in the UK before 2004 and since 2004. (Unfortunately,

we are not able to separate immigrants by country of origin because of the relatively small numbers in the sample.) The main research question is: Are variations in the labour market outcomes of the non-migrant population in the UK related to the variations in the spatial concentration of migrants? To answer this question, characteristics of the local labour markets, such as employment and occupational structures, need to be accounted for. In addition, we also explore the relationships according to:

(a) period of migrant arrival;
(b) different ethnic groups within the British-born population; and
(c) different levels of education.

Our results show that, although post-2004 immigrants do not have a negative effect on the labour market overall, negative impacts do appear in areas with small pre-2004 immigrant populations. In these areas, new immigrants have a negative labour market impact for non-migrant workers seeking work in white collar occupations. Our results also confirm findings from a previous study on the economic impacts of immigrants (Shapira, 2008), where wages of non-migrant workers and, especially, those with high skill levels were also negatively affected in areas where new immigrants were in relatively high proportion. Furthermore, pre-2004 immigrants were shown to (1) compete with non-immigrant workers in low skilled occupations while (2) not impact the opportunities of working in higher status occupations of non-migrants workers.

2. Theoretical Approaches to the Study of Immigration Labour Market Effect and Hypotheses

In this study, we rely on three disciplinary sources to guide the assessment of the effect of immigration on the labour market: (1) classical economic theory, (2) sociological theories on ethnic pluralism, ethnic queues and segmented labour markets, and (3) economic geography.

2.1 Classical economic theory

Classical Economic theory suggests that a large number of immigrants may contribute to an overwhelming supply of labour for a particular skill group. This influx disrupts the equilibrium in the labour market, resulting in lower wages for particular sectors. The non-migrant (or native) workers with comparable skills are those most affected by this disruption (Friedber, 2001; Borjas, 2003). However, despite the expectations based on classical economic theory, the findings from research on the

immigration labour market impacts in US, Europe and Israel are not conclusive (cf., LaLonde/Topel, 1992; Altonji/Card, 1991; Borjas et al., 1992; Friedberg/Hunt, 1995; Cohen/Hsien, 2000; Dustmann et. al., 2005; Friedberg, 2001; Cohen-Goldner/Paserman, 2005; De New/Zimmermann, 1994; Winter-Ebmer/Zweimuller, 1999; Hunt, 1992; Pischke/Velling, 1997). Some of these studies have found a small positive effect, while others have found a small negative effect. In any case, the size of the immigration impact is much smaller than it can be expected according to the classical economic theory. For example, Borjas (2003, 2006) and Borjas/Katz (2005) found that US workers, on average, lost about three per cent of the real value of their wages due to immigration from 1980 to 2000. For high school dropouts, this loss was 9 per cent. Ottaviano/Peri (2005, 2006), on the other hand, found that immigration from 1990-2004 generated a large positive impact on the average wages of the US-born, primarily because they belong to different skill groups than do the foreign-born. They also found that the least educated suffered smaller losses from immigrant presence than was calculated previously.

Attempts to account for the differences in research findings on the impacts of immigration have led to considerable criticisms of the basic assumptions used and of the methodologies applied (Borjas, 1990). For example, the assumption of a fixed quantity of jobs in the labour market is not usually reflected in reality. An influx of migrants into a local labour market may boost development of both the service and manufacturing sectors, as well as create new jobs and additional demand for manpower, including those that are low-skilled and semi-skilled (Sassen, 1988; Soja, 1989, Waldinger, 1989). Therefore, research on the effects of immigration on the native labour market outcomes should take into account the overall labour market opportunity structure and changes in opportunities, which may be resulting directly from the arrival of new migrants (see, e.g., Shaginyan-Shapira, 2007).

The assumptions about the complementarity of skill levels of migrants and native workers have also been criticized. Some authors argue that native workers and recent immigrants cannot be compared according to their level of skills because even unskilled native workers have qualities which recent immigrants lack, for example, language spoken in the host country, common codes of behaviour and more varied networks (e.g., Borjas, 2001). This means that any negative effect of immigration would be minimal, as displaced native workers are more likely (than immigrants) to find new jobs, become self-employed or be promoted by employers (Stoll et al., 2002; Flug et al., 1994). Furthermore, in an open economy, native workers that are affected negatively by immigration are free to move to other labour markets, where immigration levels are not high (Filer, 1992; Hatton/Tani, 2005).

Despite the limitations of classical economic theory and econometric approaches, important contributions have been made by economists on the immigrant labour market effect. These include the importance of the shock supply created by immigration and the idea that immigrants only compete in certain labour sectors.

Thus, in this study, we focus two immigrant groups: those that came before 2004 and those that arrived after 2004. We also consider the effect of immigrants on the UK population according to different levels of education.

Our first hypothesis, which is derived from classical economic theory and the econometric approach, is as follows. Immigrants have different impacts on different groups of the native population in Britain. The direction and size of these impacts depend on the period of immigrant arrival, type of immigration and a degree of correspondence between the skill-level of immigrant and the native person. We address two specific aspects of this hypothesis. The first concerns the relatively large number of immigrants that have come into the UK since 2004. Since these migrants have high levels of education (see Figure 5 and Appendix 1), they are likely to negatively affect highly skilled British workers. We test whether this is actually true. The second concerns the pre-2004 immigrants, who have generally lower levels of education than the native population. Here, we test whether these migrants are negatively affecting the low-skilled UK population.

2.2 Ethnic composition of local labour markets and the labour market impact of immigrants

Although the econometric literature has not found compelling evidence of the labour market effects of immigration, case studies by sociologists, using both qualitative and quantitative techniques, have found a large displacement effect of immigrants on native workers (see Water, 1999; Waldinger, 1999). While it is possible that these studies suffer from selection bias due to their focus on particular industries, such as catering, the research findings are interesting and worth further consideration.

The main sociological perspective used by researches working on the labour market effect of immigration is the "ethnic pluralism" approach (Lieberson, 1980). This approach stresses the importance of the multiethnic context of local labour markets. Here, the immigrant effect may vary considerably according to different ethnic compositions in the labour market. Furthermore, there may be differences amongst the native ethnic groups in terms of being affected by immigrants. The main contribution of the ethnic pluralism approach is the idea that new migrants enter a complicated ethnic-social hierarchy of local workers, competing with existing groups who have a comparable levels of skill. If the migrants are considered to be better workers in eyes of local employers, then local workers with comparable skill levels are likely to be displaced. However, local workers who have comparably higher skill levels than the new migrants may actually gain by moving to higher status positions (Fosset et a.l, 1986; Model, 1997; Resenfeld/Tienda, 1999; Wilson, 1999). Other research has shown that high levels of ethnic, occupational, sectorial or residential segmentation minimizes the negative impacts associated with new

migrants in local labour markets (Friesbie/Neidert, 1977; Tieda/Lii, 1987; Shaginyan-Shapira, 2007; Wilson/Portes, 1980; Shavit, 1992; Fosset et al., 1986).

The recognition of the multiethnic context of labour markets and the degree of labour market segmentation are both very important in assessing the impact of immigration on the labour market. Our second hypothesis results from the sociological perspective. Here, we expect ethnic composition to influence the relationship between the size of the immigrant populations and labour market outcomes of non-migrant workers. More specifically, we expect the spatial concentrations of recent migrants to depend on the size of the British-born ethnic minority population and on the size of the pre-2004 immigrant population. In areas where large populations of pre-2004 immigrants exist, more recent migrants are expected to enter occupational niches that already exist for immigrants and, therefore, they are not expected to compete with non-migrants workers. However, in areas where the pre-2004 immigrant population is relatively small or nonexistent, new immigrants are expected to directly compete with the non-migrant workers.

2.3 Geography of the local labour market approach

In recent decades, there has been a growing consensus that the labour market operates at the local geographic level (Martin/Morrison, 2003) with the areas being defined by commuting distance (Cheshire et al., 2003). The geography of the labour market approach suggests that differences arise due to varying opportunities across space. The opportunity structure of local labour markets has an especially strong impact on the economic and occupational outcomes of lower status groups, such as ethnic minorities, recent migrants and those with lower levels of education. The belief is that these groups have relatively more difficulties in finding access to more distant jobs.

It is important to control for differences in labour market opportunities across space when there exist high levels of immigrant concentrations. Generally, migrants are not randomly distributed across space in the countries to which they move. Rather, they are attracted to particular areas and segments of the labour market. This results in positive correlations between areas of high immigrant concentration and the economic outcomes of non-migrants. It may also explain the negative labour market outcomes of non-migrants, who are living in localities where a large portion of jobs are in traditional industry sectors with lower wages.

From the research literature, it is evident that there are persistent spatial patterns of poverty and inequality in Britain. Income growth during the past decade was very uneven across the country. The highest growth rates were in South East, while the lowest rates were in the Northern regions. Not surprisingly, concentrations of low income areas are associated with concentrations of other types of economic, social and environmental deprivation (Martin/Morrison, 2003).

The reasons for the spatial pattern of the economic inequality in Britain are many. Firstly, like elsewhere, deindustrialization during the 1960s and 1970s led to the growth of unemployment among workers who lived in regions where traditional industries used to exist. For instance, the North East region of British suffered from major reduction in its manufacturing industries during the 1970s and, as a result, exhibits high unemployment to this day. The South East and East Anglia, on the other hand, developed high-skilled services and technology industries during the 1980s and have experienced a major economic boom. Secondly, technological developments have also contributed to the growth of unemployment and economic inactivity during the 1980s and 1990s. New technologies make some skills no longer necessary and, thus, forces some workers out of employment or into low skilled and low paid occupations. Finally, the polarization of the labour market, where immigrants do different jobs than natives, contributes to spatial differences in labour markets. High-skilled services and high-tech industries offer jobs with relatively good conditions, security and wages, while those in low skilled services and traditional industries jobs are lower paid and insecure.

In this study, spatial differences in labour market conditions are controlled for. As a rule, conditions of local or regional labour markets are described by the unemployment rate (Morrison/Berezovsky, 2003). Other important characteristics are the level of incomes, the degree of economic inequality and the concentration of jobs in low-skilled or high-skilled sectors. All of these indicators are included in this work. In past studies of Britain's local labour markets, travel-to work-areas have been used (see e.g., Reimer, 2003). Here, local labour markets are approximated by the residence locality of the respondents.

3. Methodology: Data, Variables and Method

3.1 Data

The ability to test the effect of immigration on the labour market in Britain has become possible since the launching of the Annual Population Surveys in 2004 by the Office for National Statistics. In this study, the 2006 Annual Population Survey

(APS) data set is used to examine the income of employed persons in Britain. The APS provides reliable estimates for small areas at one point in time. The APS includes key variables from the Labour Force Survey, such as education, employment and ethnicity. The sample size of the 2006 APS is 375,865 individuals. This sample covers 201 Unitary Authorities (UA) / Local Authority Districts (LAD), which are considered proxies of local labour markets in this chapter. The sample size for the UA/LAD varies from 601 in Rutland to 7691 in Northern Ireland. Numbers of migrants vary from one in Stirling to 640 in Birmingham. Twenty-one localities were excluded from the final sample due to very small numbers of ethnic minorities and migrants. As a result, the analyses were conducted on 180 UA/LAD. Furthermore, the analyses are focused on individuals aged 16-65 years old.

3.2 Variables

The dependent variable in this study is the labour market destination in Britain. This variable was constructed by using the seven categories of social class as set out in Table 1 (see also Goldthorpe, 1987).

For the prediction of the labour market destination categories, several individual level and macro-level explanatory variables are used. The control variables on the level of individuals include the number of children, student status, pensioner status, disability status and family type status. .Migrant status, ethnicity, religion, age, tenure in Britain (for migrants) are used to define groups of comparison within British population.. Our main attention is concentrated on the impact of the macro-level characteristics on the labour market outcomes of individuals. On the macro level the aggregate-level variables of the UA/LAD are size of migrant and ethnic minority populations, employment, inactivity, class composition and industrial composition. The individual level variables are presented in Table 2 and the macro level variables are presented in Table 3.

To capture the effect of recent immigration on the labour market outcomes of British workers, we tested two research designs. First, we used two variables that measure (a) the percentage of pre-2004 immigrants and (b) the percentage of new immigrants. Second, we used (a) the percentage of all immigrants (both pre-2004 and new immigrants) and (b) the relative size of new immigrant population, i.e. the percentage of new immigrants among all immigrants. The findings from the two research designs are similar. The labour impact of all immigrants is not different from the labour market impact of pre-2004 immigrants, due to the fact that the proportions of pre-2004 immigrants are generally small (see Appendix 2). However, in the regression analysis, the standard errors of the estimated parameters representing new immigrants are relatively large, often making them statistically insignificant at the 0.05 level. On the other hand, the standard errors of the proportion of new

immigrants among total immigrants are relatively small with corresponding esti-
mated parameters being statistically significant. An additional advantage of using the
variables from the second research design is that it controls for the relative sizes of
the new and pre-2004 immigrants populations. For this reason, we use this design.

Table 1:   Construction of Labour Market Destination Categories

EGP Categories	Dependent Variable Categories
I. Higher Managers and Professionals II. Lower Managers and Professionals III. Higher and Lower Grade Routine non-Manual Employees IV. Small Employers[2] V. Lower Supervisory and Technical VI. Semi-routine occupations (skilled manual workers) VII. Routine occupations	1. White collar: Social classes I to III: managerial, professional and intermediate occupations 2. Higher status blue collar occupations: Social classes V and VI: skilled manual and lower supervisory occupations 3. Lower status blue collar jobs: Social class VII: semi-skilled and unskilled manual occupations and short term unemployed (reference category). 4. Outside labour market: Never worked, out of labour force or long-term unemployed.

---

2 Category IV, small employers and self-employed, was excluded from the analyses.

Table 2:   Individual level variables

Variable	Operationalisation
• **Comparison groups:**	
White British	British born who describe themselves as White British
Migrants	Those who were not born in Britain and did not describe themselves as White British
British-born ethnic minorities	Those who were born in Britain and did not describe themselves as White British
• **Religion**	Christians (reference group); Muslims; other religions
• **Age and aged squared**	
• **Tenure in Britain for migrants**	Number of years since immigration (and tenure squared)
• **Gender**	Dummy variable (1) female ; (0) male
• **Level of educational qualification** (NVQ)	No qualification (or unknown); below NVQ Level2; NVQ Level 2 (basic compulsory education up to lower secondary level); NVQ Level 3 (upper secondary qualification or post-secondary non-tertiary qualification); NVQ Level 4 (lower tertiary qualifications including B.A. or B.Sc.); NVQ Level 5 (postgraduate qualification or higher including M.Sc., M.A., M. Eng. or Ph.D.). The reference group is NVQ Level 3.
• **Marital status**	Single (reference group); married (cohabitated) and ex-married (widowed, divorced; separated).
• **Number of children in family**	
• **Student status**	Dummy variable (1) if full time student; (0) otherwise
• **Disability**	Dummy variable (1) if disabled; (0) otherwise
• **Pension**	Dummy variable (1) if getting pension; (0) otherwise
• **Family status**	Dummy variable (1) if single parent family; (0) otherwise

Table 3:   Local labour market variables

• Percentage of the total economically active population in the UA/LAD who are not UK born and do not describe themselves as "White British".
• The relative size of new immigrant population – the percentage of the migrant population who are "new" migrants, i.e., migrants arrived in 2004 or thereafter out of the all population of migrants in the UA/LAD.
• Percentage of the total economically active population in the UA/LAD who are British-born ethnic minorities.
• Percentage of the total economically active population in the UA/LAD who are employed.
• Percentage of the total employed population who are employed in manufacturing jobs.
• Percentage of the total employed population who are employed in construction jobs.
• Percentage of the total employed population who are employed in banking and finance.
• The degree of the overall socio-economic well-being of the locality, i.e., the percentage of the total employed population who are in Socio-Economic Class I (according to the EGP classification).

3.3 Statistical method

We use hierarchical linear modelling or HLM (Bryk/Raudenbush, 2002). The multi-level multi-nomial regression model predicts the individual opportunities of being in particular labour market destinations and provides (i) random intercepts to estimate how particular characteristics at the macro level affect average values of the dependent variables in each one of the macro-level units, and (ii) random slopes of particular independent variables which subdivide the population by sub-group (immigrant status, ethnicity, religion and level of education) so as to test whether all sub-groups in the particular macro-level unit are affected by the macro-level variables in a similar or different fashion.

This model is specified as:

$$Logit \left(E_k\right)_{ij} = \left(\gamma_{00} + \sum_{j=1}^{J} \mu_{oj} + \sum_{j=1}^{J} \sum_{s=1}^{Sq} \gamma_{qk} z_{sj} \right) + \sum_{j=1}^{J} \sum_{q=1}^{Q} \gamma_{q0} x_{qij}$$

$$+ \sum_{j=1}^{J} \sum_{q=1}^{Sq} \mu_{qj} x_{qij} + \sum_{j=1}^{J} \sum_{q=1}^{Q} \sum_{s=1}^{Sq} \gamma_{qs} z_{sj} x_{qij} \qquad (1)$$

where the subscript k indicates a particular labour market destination (k = 1, 2, 3); subscripts i and j indicate individual i in locality j (j = 1…J); X is a vector of (length Q) independent variables on the level of individuals (x_{ijq}={x_{ij1}…x_{ijQ}}); and z is a vector of (length S) independent variables on the level of localities (z_{js}={z_{j1}…z_{jS}}).

In Equation (1), γ_{00} is the intercept, μ_{0j} is the random intercept for localities and $\sum\gamma_{qs}x_{sj}$ captures the level 2 covariates, i.e., percentage migrant population, relative size of the new migrant population, percentage ethnic minority, percentage employed; percentage employed in manufacturing sector, percentage employed in construction sector, percentage employed in banking and finance sector and degree of the overall socio-economic well being in the locality as a percentage of population in the socio-economic class I.

The fourth term in Equation (1) ($\sum\gamma_{q0}x_{qij}$) captures the individual level covariates (i.e., age, age-squared, migrant tenure in Britain, migrant tenure in Britain-squared, and dummy variables for migrants, ethnic minorities, Muslims and religions other than Christian and Muslims, gender, being married, being divorced. A series of dummy variables are also used for level of educational qualification, number of children, student status, family status, pensioner status and disability status. The fifth term in Equation (1) includes the random slopes of the level 1 variables, which are assumed to vary between localities. Finally, the sixth term includes the cross-level interactions between the local-level variables and the various dummy variables. This allows the estimation of the macro-level covariate impacts on the various groups contained in this study.

4. Findings

4.1 Descriptive findings

Descriptive findings are presented for four groups in the British population: White British, British-born ethnic minorities, pre-2004 immigrants and new (post-2004) immigrants.

4.1.1 Immigrant population in Britain

In Figure 1, the compositions of the immigrant population in Britain by period of arrival in Britain and by ethnic origin are presented. The largest shares of immigrants arrived between 1961-1995, with the exception of immigrants from Eastern or Central Europe. In this case, over 90 per cent arrived after 1995 (54 per cent arrived after in 2004).

238

Figure 1:   Immigrants in Britain by region of birth and period of immigration, APS 2006

| | before 1996 | 1996-2003 | 2004 onwards |
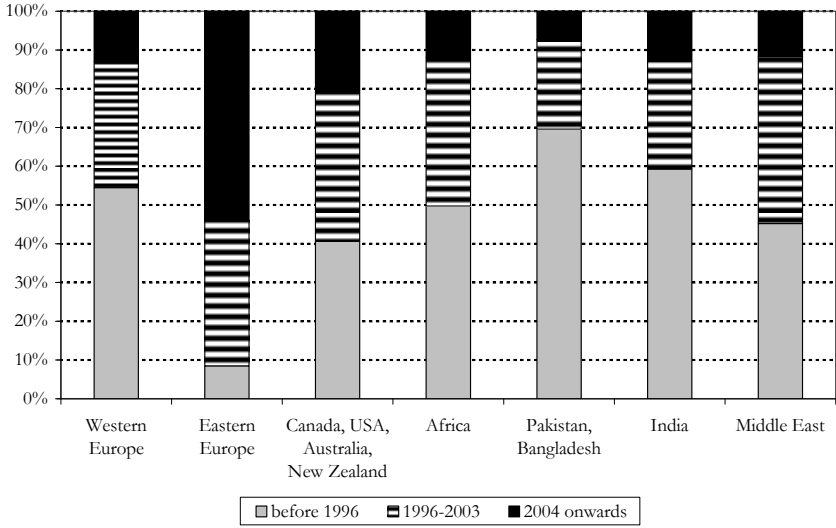
Figure 2:   Immigrants in Britain by region of birth, period of immigration and employment status, APS 2006

| | Western Europe | Eastern Europe | America | Asia | Africa |
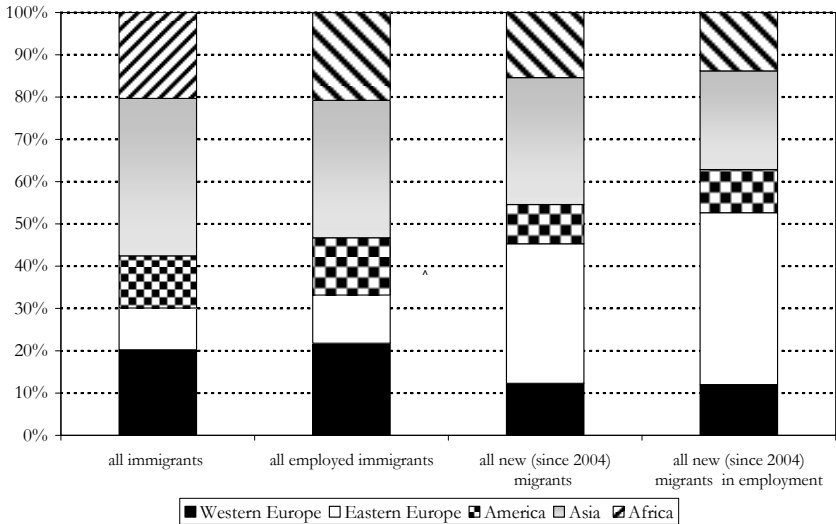
In Figure 2, the differences in national or ethnic composition that exist between pre-2004 immigrants and new immigrants are presented. Among new immigrants, the proportion from Eastern and Central Europe was very large (about 30 per cent overall and 40 per cent among employed.

4.1.2 Spatial distribution of migrants in Britain

The spatial distribution of the immigrant population in Britain is very uneven. On average, about 7 per cent of the economically active population are immigrants. Figure 3 presents the distribution of immigrants in Britain by region. For corresponding information at the UA level in the South East region, Eastern region, Wales and Scotland.

The largest spatial concentrations of new immigrants are in London and in the Eastern and Southern regions. Interestingly, the new immigrants are more evenly distributed throughout all regions than the pre-2004 immigrants. The correlation between the spatial distribution of pre-2004 and new immigrants is negative. There are some regions, especially in the north of England and in Scotland, where new immigrants live in localities where the pre-2004 immigrant population are relatively small or even zero.

Figure 3: Regional differences in percentage (in total population of a region) of pre-2004 (settled) and post-2004 (new) immigrants in Britain , *APS* 2006
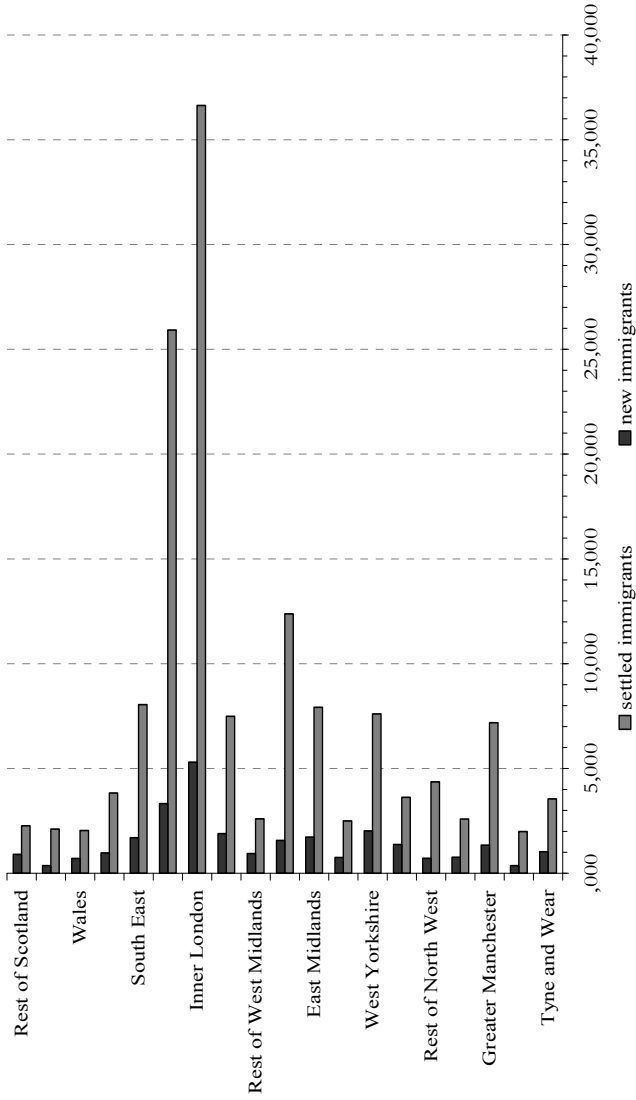
4.1.3 Educational composition of British population

The main differences in the educational levels of persons in Britain are found between immigrants and the British-born population. Indeed, on average, educational compositions are fairly similar for various ethnic groups in the British-born population. Migrants, on the other hand, have high shares of people without educational qualifications and qualifications that are not classified according to the National Vocational Qualification (NVQ) scheme. The share of people with unclassified qualifications is particularly a high among new immigrants (55 per cent). Obviously, the shorter the immigrant tenure, the more difficulties immigrants have in translating their qualifications obtained abroad into the British system of educational level classification (see Figure 4). The proportion of people without educational qualifications among the new immigrants is smaller than among pre-2004 immigrants. Its level is close to that of the British-born population.

Figure 4: Level of highest educational qualification by immigration and ethnicity, British population aged 18-64 years, APS 2006
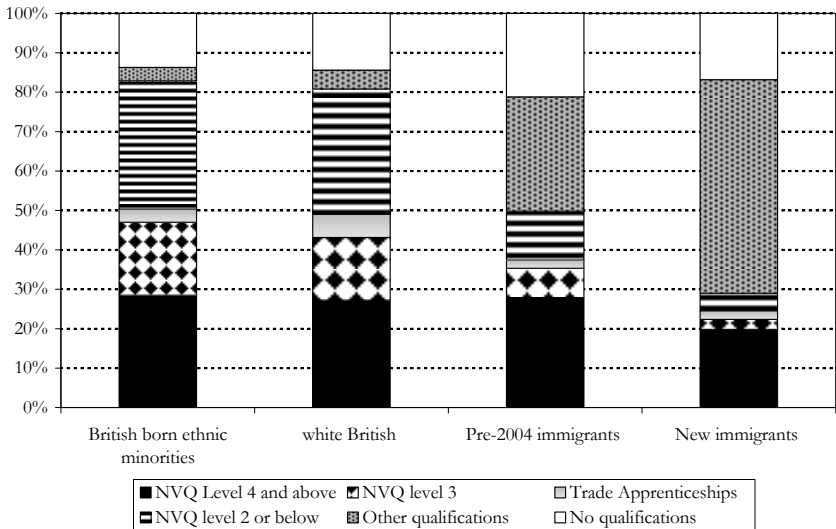
4.1.4 Labour market destinations

The distribution of the British population according to their destination in the labour market is presented in Figure 5. Although the main differences in educational

qualifications are between the native-born and immigrants, other important differences do exist within British-born population as well. Thus, White British have more favourite labour market destinations than do British-born ethnic minorities. They have higher proportions in white collar, self employed, lower-supervisory and skilled-manual occupations, and lower proportions of economically inactive people. The pre-2004 immigrants' distribution resembles that of the British-born ethnic minorities. The new immigrants are different from all other groups in the British labour market. They have proportions in semi-skilled and unskilled occupations that are twice as high as among any other group. New immigrants also have the smallest proportion of self-employed and the smallest proportion of people working in white collar occupations.

Figure 5: Destinations in the labour markets of the UK population aged 18-64 years, APS 2006
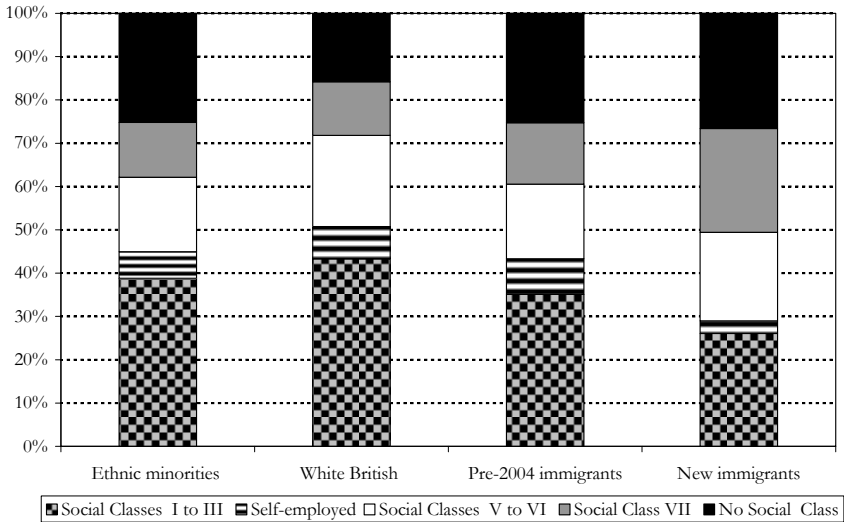
4.1.5 The relationship between British labour market destinations and the spatial concentration of immigrants

We now proceed to the subject of our main interest, i.e., the relationship between the spatial concentration of immigrants and the labour markets destinations of various population groups in Britain. In Figure 6, a comparison is made between labour market destinations and the population densities of new immigrants.

Figure 6: Labour market destinations in Britain according to spatial concentration of post 2004 (new) immigration, APS 2006
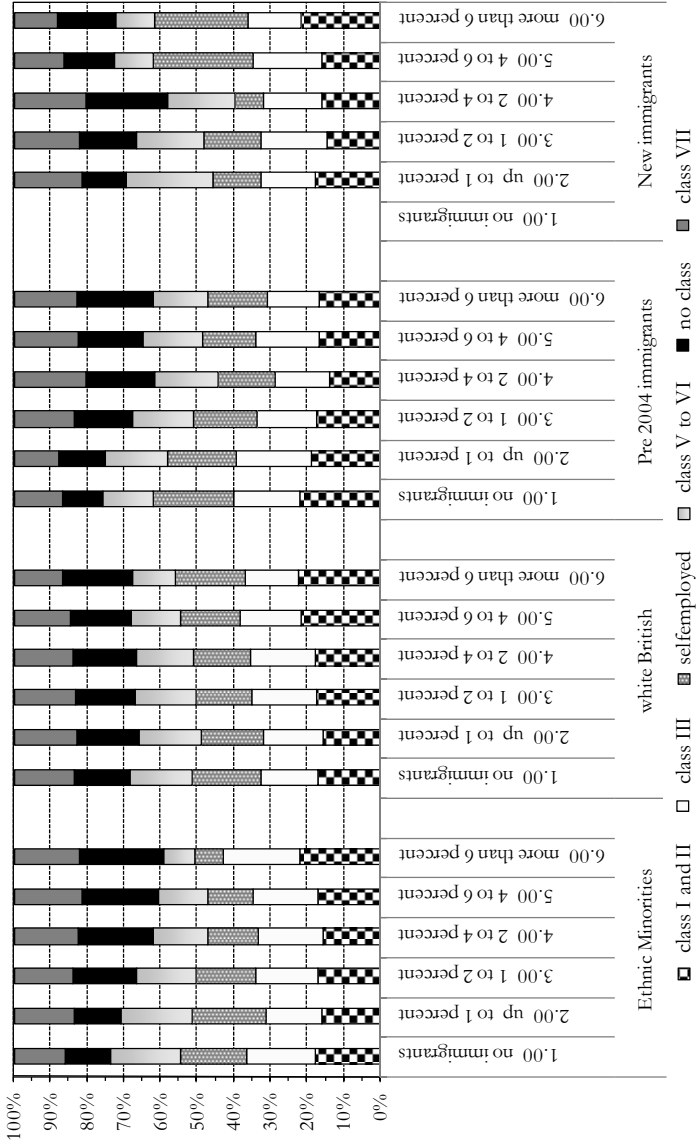
Figure 7: Labour market destinations of population in Britain according to spatial concentration of pre-2004 (settled) immigration, APS 2006

245
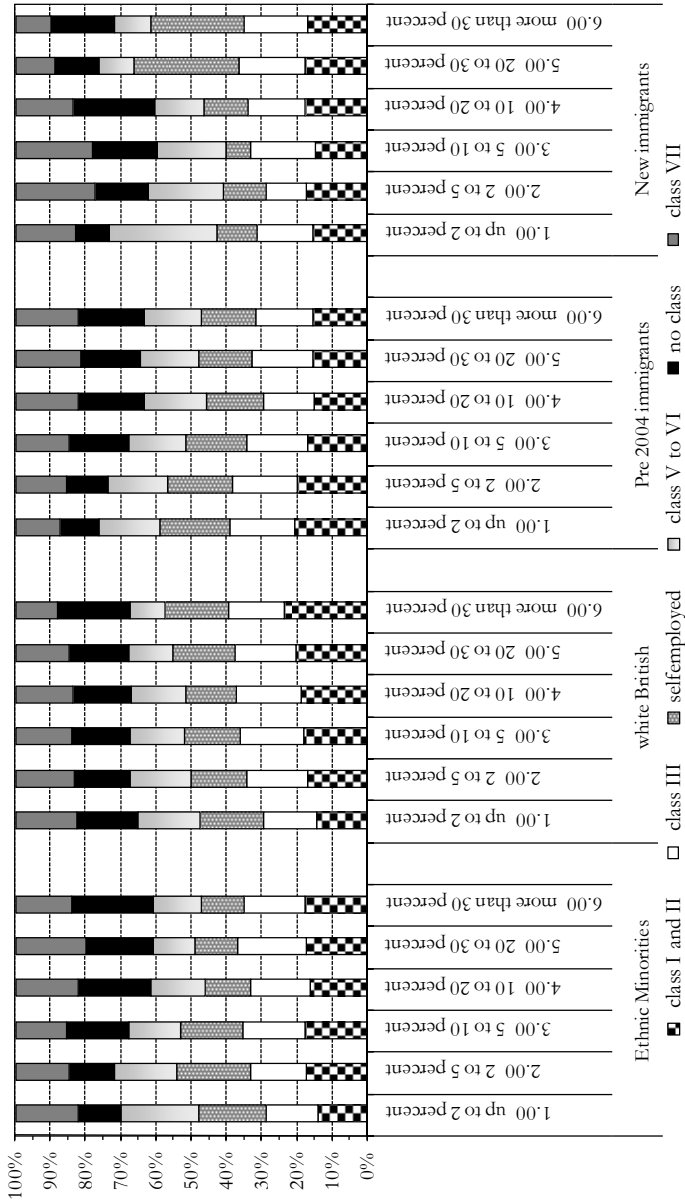
For the White British, an increase in new immigrant populations corresponded with relative increases in the percentage of persons in white collar occupations and relatively decreases in the percentage of persons in unskilled occupations. British-born ethnic minorities who live in areas with larger populations of new immigrants tend to have larger proportions of economically inactive populations and a smaller share in blue collar occupations, as well as a smaller proportion of self-employed. Among pre-2004 immigrants, the share of white-collar occupations decreases with larger populations of new immigrants, while the proportion of the economically inactive increases. New immigrants living in areas with high proportions of new immigrants tend to have higher proportion of persons in white collar occupations and lower shares in blue collar occupations.

In Figure 7, the distributions of British population groups according to various population densities of pre-2004 immigrants are shown. Here, ethnic minorities in areas of increasing pre-2004 immigrants exhibit increases in the share of economically inactive. Pre-2004 immigrants have the largest proportion of white collar jobs and the smallest share of economic inactivity in areas with the small populations of pre-2004 immigrants. Finally, new immigrants have higher proportion of white collar jobs in areas with the largest concentrations of pre-2004 immigrants. Economic inactivity among new immigrants is lowest in areas with very small populations of pre-2004 immigrants.

The associations described above do not account for the characteristics of individual workers, nor the conditions of the local labour markets. They also do not account for the associations between the spatial concentrations of immigrants. To control for these factors, we apply multilevel multivariate regression analyses of labour market outcomes, which are described in the next sub-section.

4.2 Hierarchical multinomial regression modelling results

The estimated parameters of the individual level variables are presented in Appendix 2. The statistical relationships of these variables on the labour market destinations of British population are not different from those reported by previous studies. In this section, the results from the hierarchical multinomial regression modelling are presented. The analyses focus on those outside the labour force or long-term unemployed in Table 4, those who are in skilled manual or lower supervisory occupations in Table 5 and those in white collar occupations in Table 6. The statistical significances of the explanatory variables are presented in Appendix A2.2.

4.2.1 Analysing the probability of being out of the labour force or in long-term unemployment

Column 1 in Table 4 refers to the estimated parameters of the random intercept model. The estimated parameter for the percentage of immigrants is 0.01 when the characteristics of local labour markets are not introduced in the regression model (upper-half in Table 4). This means that an increase of the migrant population by one per cent leads to a one per cent increase in the odds of the reference group of population of becoming economically inactive rather than being short-term unemployed or working in unskilled jobs. This impact stays constant when the local labour market characteristics are accounted for (see the bottom half of Table 4). The estimated parameter for the percentage of new immigrants is not significant (not shown in Table 4).

In Table 4, the estimated parameters of the macro-level regression for random slopes of dummy variables are presented in Columns 2 to 5, subdividing the population into immigrants, British-born ethnic minorities (Muslims/others) and low-educated population. The findings are that, for all groups of comparison, the spatial concentrations of immigrants increase the odds of being economically inactive similar to that of the reference group. Indeed, the only group for which the estimated parameter is statistically significant are immigrants. The value of -0.02 demonstrates (Column 2, upper-half) that, overall, a one per cent increase in size of migrant population decreases by two per cent the odds of economic inactivity amongst immigrants. However, once variables describing the conditions of local labour markets are controlled for, this estimated parameter becomes not significant for all sub-populations.

The statistically significant and negative value of -0.025 for British-born ethnic minorities (see column 3 in Table 4) implies that their spatial concentrations have a positive impact on the chances of the reference group being economically active, i.e., a one per cent increase in the size of the ethnic minority population in local labour market decreases on 2.5 per cent their chances of economic inactivity. In addition, all individuals have lower odds of economic inactivity in local labour markets characterised by a higher proportion of jobs in manufacturing and construction, as well in labour markets with higher proportions of permanent jobs and with higher proportions in unskilled occupations. To summarize, the opportunities of economic activity for all non-immigrant groups in Britain are negatively affected by higher concentrations of immigrants in the local labour market.

Table 4: Estimated parameters (with robust standard errors in parentheses) of the macro-level random slopes and random intercept model: Probability of being economically inactive (or long tern unemployed) versus being in an unskilled job (or short-term unemployed)

	Estimated parameters for random intercept and slopes				
	Model with contextual effects of size of immigrant and size of ethnic minority populations				
Macro (local labour market) level variables	Intercept	Immigrants	British Minorities	Educational qualifications Below NVQ level 2	Muslims
Intercept	.80(.02)**	.20(.10)*	.07(.07)	-.83(.04)**	1.26(.10)**
Percentage of immigrants	.011(.00)**	-.016(.00)**	-.002(.05)	.008(.03)*	.002(.01)
Percentage of new immigrants in the whole population of immigrants	-.001(.00)	-.004(.00)	-.005(.00)	.002(.00)	.001(.01)
Percentage of British born ethnic minorities	-.00(.00)	.009(.01)	-.025(.01)**	-.006(.00)	-.024(.02)
	Model with contextual effects of size of immigrant and size of ethnic minority populations and opportunity structure of local labour markets				
Intercept	0.79(.02)**	0.21(.10)	0.06(.07)	-.87(.04)*	1.29(.11)**
Percentage of immigrants	0.01(.00)**	-.025(.00)**	-.007(.007)	.004(.03)	.004(.01)
Percentage of new immigrants in the whole population of immigrants	-.001(.00)	-.002(.00)	-.005(.005)	.002(.00)	-.004(.01)
Percentage of British born ethnic minorities	.001(.00)	.015(.012)	-.027(.00)**	-.011(.05)*	-.013(.02)
Percentage employed	.005(.01)	-.039(.03)	-.023(.03)	.063(.01)**	.048(.05)
Percentage in manufacturing	-.013(.00)**	-.006(.01)	-.003(.01)	.003(.01)	-.004(.02)
Percentage in construction	-.012(.01)**	.034(.03)	-.015(.04)	-.011(.01)	-.029(.05)
Percentage with permanent jobs	-.017(.01)**	-.032(.03)	-.015(.04)	-.022(.01)	.064(.05)
Percentage in personal services	.00(.00)	.050(.04)	.021(.03)	.005(.013)	.055(.06)
Unskilled jobs	-.04(.01)**	-.05(.02)**	.011(.02)	-.03(.01)**	.09(.04)*
Percentage in class 1	-.008(.00)	.021(.02)	.009(.02)	-.02(.01)*	.026(.03)

** statistically significant on level p=0.005.
 * statistically significant on level p=0.05.

4.2.2 Analysing the probability of being in skilled manual or lower supervisory occupations

For White British, spatial concentrations of immigrants do not have a statistically significant impact on their odds of working in higher status blue collar occupations (see column 1 in Table 5). This means that the percentage of immigrants in local labour markets do not affect the odds of working in skilled manual or lower supervisory occupations relative to the odds of working in unskilled occupations. However, in examining other characteristics of local labour markets, one can see that the odds of working in skilled manual or lower supervisory occupation are positively affected by the overall opportunity structure expressed through the percentage of employed. For immigrants, large concentrations of ethnic minorities represent an additional factor that positively affects their odds of working in skilled manual occupations and construction. High percentages in manufacturing, on the other hand, work in the opposite direction.

Table 5: Estimated parameters (with robust standard errors in parentheses) of the macro-level random slope and random intercept model: Probability of being in unskilled jobs or short-term unemployed relative to the probability of being in occupation classes V and VI

	Estimated parameters for random intercept and slopes				
	Model with contextual effects of size of immigrant and size of ethnic minority populations				
Macro (local labour market) level variables	Intercept	Immigrants	British Ethnic Minorities other than Muslims[3]	Educational qualifications Below NVQ Level 2	Muslims
Intercept	.71(.10)*	-.048(.09)	-.014(.04)	-.68(.03)**	-.062(.09)
Percentage of immigrants	-.002(.01)	-.007.00)*		.005(.00)	-.00(.00)
Percentage of new immigrants in the whole population of immigrants	-.000(.00)	-.005(.00)		-.00(.00)	-.00(.00)
Percentage of British born ethnic minorities	-.000(.00)	.015(.01)		-.006(.00)	-.00(.00)
	Model with contextual effects of size of immigrant and size of ethnic minority populations and opportunity structure of local labour markets and opportunity structure of local labour markets				
Intercept	.72(.01)**	-.030(.09)	-.016(.04)	-.65(.03)**	-.036(.09)
Percentage of immigrants	.002(.00)	-.006(.00)		.00(.00)	-.008(.01)
Percentage of new immigrants in the whole population of immigrants	.000(.00)	-.002(.00)		.001(.00)	-.010(.01)
Percentage of British born ethnic minorities	.002(.00)	.017(.01)*		-.005(.00)	-.024(.04)
Percentage of employed	.04(.00)**	.024(.02)		.001(.01)	.00(.00)
Percentage in manufacturing	.002(.00)	-.021(.01)*		-.009(.00)*	.00(.00)
Percentage in construction	-.004(.00)	.041(.02)*		.001(.01)	.00(.00)
Percentage with permanent jobs	-.007(.01)	.00(.00)		.00(00)	.00(.00)
Percentage in other services	.00(.00)	.00(.00)		.022(.01)*	-.030(.03)
Unskilled jobs	-.017(.00)**	-.05(.02)*		-.024(.00)**	.08(.03)*
Percentage in class 1	-.007(.00)*	-.007(.01)		.007(.01)	.016(.02)

** statistically significant on level p=0.005; * statistically significant on level p=0.05.

3 Only the random intercept model was estimated for British-born ethnic minorities.

4.2.3 Analysing the probability of being in white collar occupations relative to being unemployed or in unskilled jobs

The spatial concentrations of immigrants do not affect the probabilities of being in white collar occupations if the characteristics of the local labour markets are accounted for. However, in localities where the percentage of new immigrants among the total population of immigrants is high, or in localities where before 2004 immigrant populations were very small, increases in new immigrant populations slightly decrease the odds of being in a while collar occupation for the reference group, i.e., the British White population (see Column 1 in Table 6.).

A large immigrant presence (both pre-2004 and new immigrants) negatively affects the reference group's odds of working in while collar occupations (Column 2 in Table 6). Controlling for the labour market opportunity structure does not change the direction and only reduces slightly the magnitude of the effect. However, the presence of British-born ethnic minority populations has a large positive effect on the odds of working in white collar occupations for the British White population. This positive effect is even stronger for immigrants, where the estimated parameter is 0.11 for the reference group and with an additional positive increment for immigrants of 0.03.

For British-born minorities, the immigration effect on the odds of working in white collar occupations is not different from the reference group. However, British-born minorities have lower odds of working in higher status occupations in localities with high spatial concentrations of ethnic minorities.

Finally, for low educated workers, immigration negatively affects the probability of working in white collar occupations, which disappears after controlling for the local labour market opportunity structure. However, higher concentrations of British-born ethnic minorities retain a negative effect on the opportunities of low educated workers to get higher status jobs, even if the local labour market opportunity structure is accounted for.

Table 6: Estimated parameters (with robust standard errors in parentheses) of the macro-level random slope and random intercept model: Probability of being in unskilled jobs or short-term unemployed relative to being in occupations classes I, II and III

	Estimated parameters for random intercept and slopes			
	Model with contextual effects of size of immigrant and size of ethnic minority populations			
Macro (local labour market) level variables	Intercept	Immigrants	British Minorities	Educational qualifications Below NVQ Level 2
Intercept	1.97(.002)**	-.200(.09)*	.030(.06)	-.520(.03)**
Percentage of immigrants	.014(.003)**	-.020(.00)**	-.000(.00)	-.005(.05)*
Percentage of new immigrants in the whole population of immigrants	-.005(.00)**	-.011(.00)**	.000(.00)	-.002(.001)
Percentage of British born ethnic minorities	.001(.00)	.016(.01)	-.024(.08)**	-.010(.00)**
	Model with contextual effects of size of immigrant and size of ethnic minority populations and opportunity structure of local labour markets			
Intercept	1.99(.02)**	-.213(.08)*	.072(.06)	-1.50(.03)
Percentage of immigrants	.004(.002)	-.034(.01)**	.008(.01)	-.005(.00)
Percentage of new immigrants in the whole population of immigrants	-.003(.00)*	-.010(.00)**	-.002(.04)	-.002(.00)
Percentage of British born ethnic minorities	.011(.00)**	.028(.01)*	-.015(.01)	-.011(.00)**
Percentage of employed	.079(.01)**	-.003(.03)	-.06(.03)*	.028(.01)**
Percentage in manufacturing	-.007(.01)	-.007(.01)	-.007(.01)	-.012(.00)**
Percentage in construction	.046(.03)	.046(.03)	.012(.03)	.014(.01)
Percentage with permanent jobs	-.029(.03)	.029(.026)	-.016(.028)	-.028(.01)*
Percentage in banking and finance	.030(.00)**	.00(.00)	.00(.00)	.004(.01)
Percentage in personal services	.028(.03)	.076(.03)*	.042(.02)	-.001(.01)
Percentage in other services	.050*(.02)	.051(.02)*	.018(.03)	.015(.01)
Unskilled jobs	-.100(.02)	-.010(.02)	.054(.023)*	-.060(.01)**
Percentage in class 1	.030(.00)**	.043(.01)**	.017(.02)	-.020(.01)*

** statistically significant on level p=0.005.
* statistically significant on level p=0.05.

5. Discussion and conclusions

In this study, we addressed the relationship between spatial concentrations of immigrants and labour market opportunities of non-migrant workers in the British labour market. Multilevel multinomial regression analyses were conducted to explore whether variations across local labour markets were systematically related to the variations in the spatial concentration of immigrants, after accounting for variations in the characteristics of these local labour markets. The findings show that spatial concentrations of pre-2004 immigrants are not associated with the chances of non-migrant workers in higher status occupations. However, the spatial concentrations of pre-2004 migrants were positively associated with higher odds of economic inactivity for the non-migrant population. Furthermore, higher proportions of new immigrants in the population is negatively associated with higher odds of non-migrant workers in white collar occupations. Thus, the first hypothesis in our study has been confirmed. Overall, immigrants do not have a negative effect on occupational opportunities of non-migrant British workers who have average levels of educational attainment. Moreover, our earlier findings (see Shapira, 2010) show that immigrants have a positive effect on the wages of non-migrant workers.

It seems that immigrants are more likely than the British-born population to look for employment or to work in unskilled occupations. Although this finding could be interpreted as an indication of competition between immigrants and native-born workers for low skilled occupations with a subsequent substitution of native workers by immigrants, as reported in Waters (1999) and Waldinger (1999), alternative explanations are also possible. For example, it could be that the native-born population has more alternatives to low paid employment and relies more on state benefits or personal savings than do immigrants. It may also be the case that the migrants are taking jobs which are not wanted by the native-born population. In any case, only detailed case studies can confirm or reject the hypotheses about the competition between the immigrants and native workers. Furthermore, the new immigrants, being better educated than immigrants who arrived earlier, affected the odds of British-born populations working in white collar occupations negatively. These findings are in accord with our previous study which shows that new immigrants have a negative effect on the wages of British-born workers. The group most seriously affected in terms of wages by "new immigrants" are those with highest level of educational qualification (Shapira, 2010).

The negative effect of new immigration does not exist in every local labour market with a large population of new immigrants. In accordance with the expectations of Hypothesis 2, the labour market impact of new immigrants depends on the size and composition of the immigrant population in local labour markets. The negative effect of the presence of new immigrants is felt by non-migrant workers only in those localities where immigrant populations were small before 2004. Fur-

thermore, in local labour markets where immigrants and non-immigrant workers occupied particular occupational niches, the arrival of new immigrants after 2004 did not disturb this balance as they primarily entered existing labour market niches for immigrant workers. However, the situation is different for those local labour markets with small immigrant populations before 2004, and where such a balance did not exist. In these areas, the new arrivals are likely to be competing for the same jobs with non-migrants, whose outcomes are negatively affected.

Contrary to our expectations, immigrants have a similar effect on all non-migrant populations. We did not find any evidence that British-born ethnic minorities or people with lower levels of education are negatively affected by immigration. However, the spatial concentrations of immigrants did have a strong negative effect on the occupational opportunities of migrants themselves. Thus, in local labour markets with large immigrant populations, immigrants are more likely to have un-skilled jobs than work in higher status blue collar occupations or in white collar occupations.

Also contrary to our expectations, the ethnic composition of local labour markets did not mediate the relationship between spatial concentrations of immigrants and the labour market outcomes of non-migrant workers. Nor does accounting for the size of the ethnic minority population change the labour market effect of immigration. A high percentage of British ethnic minorities positively affected the odds of higher status occupations for the White British population and even more so for immigrants. However, for ethnic minorities, as well as for low-skilled workers, a large presence of British-born ethnic minorities in the local labour markets has a negative effect on their odds in higher status occupations. These findings partially support evidence of previous research based on the ethnic pluralism approach and split or sheltered labour market concepts (see Friesbie/Neidert, 1977; Tienda/Lii; 1987, Wilson/Portes, 1980; Shavit, 1992; Fosset et al., 1986).

Finally, findings from this research show that local labour market characteristics are an important mediator between spatial concentrations of immigrants and the labour market outcomes of native workers. Controlling for the structure of local labour market characteristics changes the relationship between the size of immigrant populations and the labour market outcomes of non-migrant population. Hence the impact of immigration on the labour market impact cannot be properly understood without first considering how spatial differences in the labour market outcomes of individuals are related to differences in the local labour market opportunity structures.

In conclusion, this study has considered the issue of the effect of immigration on the British labour market in a more comprehensive and systematic way than previous studies through a consideration of 180 local labour markets across Britain and controlling for other characteristics of the local labour markets that might be responsible for across labour market variations in employment opportunities. We

believe that this study contributes both to the methodology on study of the labour market effect of immigrants, as well offers new empirical evidence about this impact on the British labour market.

References

Altonji, J.G./ Card, G. (1991): The effects of immigration on the labor market outcomes of less-skilled natives. In: Abowd, J.M./ Freeman, R.B. (eds.): Immigration, Trade, and the Labor Market. Chicago. The University of Chicago Press.

Bauer. T./ Zimmermann, K.F. (1999): Assessment of Possible Migration Pressure and Its Labour Market Impact Following EU Enlargement to Central and Eastern Europe. IZA Research Report N.3.

Beesley, R. (2002): Joined up data: Finding the best data sources for your needs: http://www.statistics.gov.uk/about_ns/data_coherence/downloads/interim_booklet.pdf.

Bean, F.D./ Van Hook, J./ Fossett, M.A. (1999): Immigration, Spatial And Economic Change, and African – American Employment. In: Bean, A.D./ Bell-Rose, S. (eds.): Immigration and Opportunity: Race, Ethnicity and Employment in the United States, N.Y. Russell Sage Foundation.

Beggs, J.J./ Villemez, W.J./ Arnold, R. (1997): Black Population Concentration and Black-White Inequality: Expanding the Consideration of Place and Space Effects. In: Social Forces 76(1), 65-91.

Blanchflower, D./ Saleheen, J./ Shadforth, C. (2007): The Impact of the Recent Migration from Eastern Europe on the UK Economy, Bank of England, available at: http://www.bankofengland.co.uk/publications/speeches/2007/speech297.pdf.

Riley, R./ Weale, M. (2006): Commentary: Immigration and Its Effects, National Institute Economic Review, No. 198.

Blanchflower, D. (2007): Recent Developments in the UK Labour Market, Bank of England Quarterly Bulletin, Q1.

Borjas G.J. (2004): Increasing the Supply of Labour Through Immigration: Measuring the Impact on Native-born Workers. Centre for Immigration Studies. available at: http://www.cis.org.

Borjas G.J. (2003): The Labour Market Demand Curve is Downward Sloping: Re-examining the Impact of Immigration on the Labour Market. In: The Quarterly Journal of Economics, 1335-1374.

Borjas G.J. (2001): Does Immigration Grease the Wheels of the Labour Market? Brooking Papers on Economic Activity. available at: http://www.oecd.org/LongAbstract/0,2546,en_2649_34321_24741854_1_1_1_37435,00.html.

Borjas G.J. (1990): Friends or Strangers: The Impact of Immigrants on the U.S. Economy. New York. Basic Books.

Borjas, J./ Freeman., R.B./ Katz, L.F. (1992): On the Labour Market Effects of Immigration and Trade. In: Borjas, J./ Freeman, R.B. (eds.): Immigration and the Work Force: Economic Consequences for the United States and Source Areas. Chicago.

Brook, K. (2004): Labour Market Data for Local Areas by Ethnicity. Technical Report. Office for National Statistics. Labour Market Trends.

Camarota. S.A. (2004): A Jobless Recovery? Immigrant Gains and Native Losses. Centre for Immigration Studies. available at: http://www.cis.org.

Card. D. (1990): The Impact of the Muriel Boatlift on the Miami Labour Market. In: Industrial and Labour Relation Review 43(2), 245-257.

Card. D. (2001): Immigrant Inflow. Native Outflows and the Labour Market impacts of Higher Immigration. In: Journal of Labour Economics 19(1), 22-64.

Cheshire, P./ Monastiriotis,V./ Sheppard, S. (2003): Income inequality and residential segregation: labour market sorting and demand for personal goods. In: Martin, R./ Morrison, P.S. (eds.): Geographies of Labour Market Inequality. London, N.Y. Routledge.

Cohen-Goldner, S./ Paserman, D. (2004): The Dynamic Impact of Immigration on Native's Labour Market Outcomes: Evidence from Israel. IZA Working Paper 1315. available at: SSRN: http://ssrn.com/abstract=596962.

De New, J.P./ Zimmermann, K.F. (1994): Native Wages Impacts of Foreign Labour: A random Effects Panel Analysis. In: Journal of Population Economics, 910-91.

Dench, J./ Hurstfield, S./ Hill, D./ Akroyd, K. (2006): Employers' use of migrant labour. Main report, Home Office Online Report 04/06.

Dench, J./ Hurstfield, S./ Hill, D./ Akroyd, K. (2005): The Impact of Immigration on British Labour Market. In: The economic Journal 115, F324-F341.

Dustmann, C./ Faber, F. (2005): Immigrants in Britain Labour Market. In: Fiscal Studies 26(4), 423-470.

Dustmann, C./ Fabbri, F./ Preston, I. (2005): The Impact of Immigration on the UK Labour Market. CReAM Discussion Paper Series CDP No 01/05.

Dustmann, C./ Hatton, T./ Preston, I. (2003): The Local Labour Market Effects of Immigration in Britain. Department of Economic, University College, London.

Filer, R.K. (1992): The Effect of Immigrants Arrival on Migratory patterns of Native Workers. In: Borjas, J./ Freeman, R.B. (eds.): Immigration and the Work Force: Economic Consequences for the United States and Source Areas. Chicago: University of Chicago Press.

Flug, K./ Hercowitz, Z./ Levi, A. (1994): A Small-Open Economy Analysis of Migration. Foerder Institute, Working Paper 13.

Fossett, M.A./ Galle, O.R./ Kelly, W.R. (1986): Racial Occupational Inequality, 1940-1980: National and Regional Trends. In: American Sociological Review 51(3), 421-429.

Friedberg, R. (2001): The Impact of Mass Migration on Israeli Labour Market. In: The Quarterly Journal of Economics 16(4), 1347-1406.

Freud, D. (2007): Reducing dependency, increasing opportunity: options for the future of welfare to work. DWP, available at: http://www.dwp.gov.uk/publications/wp/2007/welfarereview.pdf

Freud, D. (1998): Does University Students' Choice of Field of Study Respond to High-Skilled Immigration? Brown University Economics Department Working Paper 99-97.

Friedberg, R./ Hunt, J. (1995): The Impact of Immigrants on Host Country Wages, Employment and Growth. In: Journal of Economic Perspectives IX, 23-44.

Gilpin, N./ Henty, M./ Lemos, S./ Portes, J./ Bullen, C. (2006): The impact of free movement of workers from Central and Eastern Europe on the UK labour market. Department for Work and Pensions, Working Paper No. 29 available at: http://www.dwp.gov.uk/asd/asd5/wp29.pdf.

Goldthorpe, J.H. (1987): Social Mobility and Class Structure in Modern Britain. Oxford University Press.

Gordon, M.M. (1964): Assimilation in American Life. N.Y: Oxford University Press.

Hatton, T.J./ Tani, M. (2005): Immigration and Inter-regional Mobility in Britain , 1982-2000. In: The Economic Journal 115, F342-F358.

Heisken De New, J./ Zimmermann, K.F. (1999): Wage and Mobility Effects of Trade and Migration", in M.Dewatripont and A. Sapir (eds.) International Trade and Employments: the European Experience. Oxford University Press, 139-160.

Hunt, J. (1992): The impact of the 1962 repatriates from Algeria on the French labour market. In: Industrial and Labour Relation Review 45(3), 556-573.

Institute for Public Policy Research (2005): Britain's Immigrant Communities More Diverse than Ever. Press Release.

Lord Leitch/ HM Treasury (2006) "Leitch Review of Skills, Prosperity for all in the global economy –world class skills", available at: http://www.hm-treasury.gov.uk/media/ 6/4/ leitch_finalreport051206.pdf.

LaLonde, R.J./ Topel, R.H. (1992): The Assimilation of Immigrants in the US Labour Market. In: Borjas, J./ Freeman, R.B. (eds.): Immigration and the Work Force: Economic Consequences for the United States and Source Areas. Chicago: University of Chicago Press.

Lewin-Epstein, N./ Senyonov, M. (1994): Sheltered Labour Markets, Public Employment, and Socio-Economic Returns to Education of Arabs in Israel. In: American Journal of Sociology 100(3), 622-651.

Labour Force Survey User Guide. 2006. available at: http://www.statistics.gov.uk/ downloads/ theme_labour/Vol5.pdf.

Lieberson, S. (1980): A Piece of the Pie: Black and White Immigrants Since 1880. Berkeley: University of California Press.

Martin, R./ Morrison, S. (2003): Thinking About the Geographies of Labour. In: Martin, R./ Morrison, P.S. (eds.): Geographies of Labour Market Inequality. London and N.Y. Routledge.

McCrone, D. (1992): Understanding Scotland: The Sociology of a Nation. London: Routledge.

Model. S. (1997): An Occupational Tale of Two Cities: Minorities in London and New York. In: Demography 34, 539-550.

Morrison, P.S./ Berezovsky, O. (2003): Labour market risk and the regions: evidence from gross labour flows. In: Martin, R./ Morrison, P.S. (eds.): Geographies of Labour Market Inequality. London and N.Y. Routledge.

National Statistics (2005): Annual Scottish Labour Force Survey 2004/05. Economic and Social Data Service Series, Cathie Marsh Centre for Census and Survey Research, University of Manchester.

Office for National Statistics (2006): Short-Term Immigration Fisiability. Report.

Ottaviano, G.I.P./ Peri, G. (2006): Rethinking the gains from immigration: theory and e vidence from the US. Fondazione Eni Enrico Mattei, Note di Lavoro, available at: http://www.feem.it/NR/rdonlyres/D8689978-76C2-428D-A625-D0E49BBA81CE/ 2198/5206.pdf.

Portes, A./ Jensen, L. (1989): The Enclave and the Entrants –Patterns of the Ethnic Enterprise in Miami Before and After Mariel. In: American. Sociological Review 54, 929-949.

Pischke, J./ Velling, J. (1997): Employment Effects of Immigration to Germany: An Analysis Based on Local Labour Markets. In: The Review of Economics and Statistics 79(4), 594-604.

Reimer, S. (2003): Employer strategies and the fragmentation of local employments: the case of contracting out local authority services. In: Martin, R./ Morrison, P.S. (eds.): Geographies of Labour Market Inequality. London and N.Y. Routledge.

Rosenfeld, M.J./Tienda, M. (1999): Mexican Immigration, Occupational Niches, and Labour-Market Competition: Evidence from Los Angeles, Chicago and Atlanta, 1970 to 1990. In: Bean, A.D./ Bell-Rose, S. (eds.): Immigration and Opportunity: Race, Ethnicity and Employment in the United States. N.Y. Russell Sage Foundation.

Sassen, S., (1988): The Mobility of Labor and Capital. Cambridge: Cambridge University Press.

Semyonov. M. (1988): Bi Ethnic Labour Markets, Mono-ethnic Labour Markets, and Socio-Economic Inequality. In: American Sociological Review 53, 256-266.

Shapira, M. (2010) Understanding Labour Market Impact of Immigration in the UK. In: Stillwell, J./ Finney, N./ van Ham, M. (eds): Understanding Population Trends and Processes Volume 3: Ethnicity and Integration, Springer (in print).

Shapira, M., (2008): Immigration Impact on Wages of British Workers. Presentation at the Annual Population Conference, Barcelona, July.

Shaginyan-Shapira, M. (2007): Ethnic Socio-Economic Inequality in an Immigrant Absorbing Society: Case of Israel. Unpublished Dissertation, University of Oxford.

Shavit, Y. (1992): Arabs in Israeli Economy: A Study of Enclave Hypothesis. In: Israeli Social ScienceResearch 7, 45-66.

Soja, E.W. (1989): Postmodern Geographies: The Reassertion of Space in Critical Social Theory. London: Verso Press.

Smith, J.P.,/Edmonston, B. (1997): The New Americans: Economic, Demographic, and Fiscal Effects of Immigration. Panel on the Demographic and Economic Impacts of Immigration. Washington, D.C.: National Academy Press.

Stoll. M.A./ Melandrez, E./ Valenzuale A. Jr. (2002): Spatial Job Search and Job Competition Among Immigrants and Native Groups in Los Angeles. In: Regional Studies 36(2), 97-112.

Tienda, M./ Lii, D. (1987): Minority Concentration and Ethnic Inequality: Blacks, Hispanic and Asians Compared. In: American Journal of Sociology 93, 141-165.

Waldinger, R. (1999): Network, Bureaucracy, and Exclusion: Recruitment and Selection in an Immigrant Metropolis. In: Bean, A.D./ Bell-Rose, S. (eds.): Immigration and Opportunity: Race, Ethnicity and Employment in the United States. N.Y. Russell Sage Foundation

Waldinger, R. (1996): Still the Promised City? African-Americans and New Immigrants in Postindustrial New York. Cambridge. Mass., London. Harvard University Press.

Waters, M.C. (1999): West Indians and African Americans at Work: Structural Differences and Cultural Stereotypes. In: Bean, A.D./ Bell-Rose, S. (eds.): Immigration and Opportunity: Race, Ethnicity and Employment in the United States. N.Y. Russell Sage Foundation

Wilson, F.D. (1999): Ethnic Concentrations and Labour Market Opportunities. In: Bean, A.D./ Bell-Rose, S. (eds.): Immigration and Opportunity: Race, Ethnicity and Employment in the United States. N.Y. Russell Sage Foundation

Winter-Ebmer, R./ Zweimuller, J. (1999): Do Immigrants Displace Young Native Workers: The Austrian Experience. In: Journal of Population Economics 12(3), 327-340.

Appendix 1

Table A1: Pearson correlations between spatial concentration of immigrants and characteristics of local labour markets

	% British born ethnic minorities	% pre-2004 immigrants	% with educational level < NVQ level 2	% in un-skilled occupations	% in social class 1	% in manu-factur-ing	% in con-struc-tion	% in banks and finance	% in distribu-tion, hotels and catering	% em-ployed
% New immigrants	.400	.772	-.163	-.002	.299	-.271	-.337	.478	-.139	-.253
% British born ethnic minorities		.594	-.055	-.045	.099	-.231	-.180	.300	-.122	-.230
% pre-2004 immigrants			-.119	-.132	.306	-.304	-.359	.581	-.203	-.330
% with educational level < NVQ level 2				.532	-.709	.459	.256	-.471	.260	-.528
% in unskilled occupations					-.629	.278	.148	-.577	.375	-.304
% in social class 1						-.298	-.426	.771	-.388	.450
% in manufacturing							-.030	-.437	.046	-.034
% in construction								-.437	.185	-.005
% in banks and finance									-.435	.145
% in distribution, hotels and catering										-.020

Appendix 2

Tables A2.1: Estimated fixed (with robust standard errors) effects for random slopes and random intercept models (variables whose effects is supposed to be random effects put in italics)

	Probability of being economically inactive(including long term unemployed) vs. probability of being in unskilled jobs (or short term unemployed)	Probability of being in higher status blue collar jobs vs. probability of being in un-skilled jobs (or short term unemployed)	Probability of being in while collar jobs vs. probability of being in unskilled jobs (or short term unemployed)
Intercept	.77(.017)**	.70(.01)**	1.97(.02)**
Gender (Male RG): Female	1.16(.02)**	.51(.02)**	.78(.02)**
Age	.04(.003)**	.00(.00)	.00(.00)
Tenure in Britain for immigrants	-.006(.003)*	.004(.003)	-.01(.03)**
Marital status (Single RG)			
Married	-.32(.03)**	.38(.02)**	
Widowed, divorced, separated	-.42(.03)**	.20(.02)**	-.31(.02)**
Immigrants	.15(.08)*	-.07(.08)	-.26(.08)**
British born ethnic minorities	.01(.01)	-.02(.04)	-.04(.05)
Religion (Christian or non religious RG)	1.19(.09)**	-.16(.07)*	-.19(.04)**
Muslim	.46(.07)**	-.06(.05)	.09(.06)
Other religion			
Educational level			
Below NVQ level 2	-.83(.04)**	-.68(.03)**	-1.52(.03)**
NVQ Level 2	-.98(.04)**	-.20(.03)**	-.50(.03)**
NVQ Level 3 RG			
NVQ Level 4	.07(.12)	.19(.04)**	1.75(.04)**
NVQ Level 5	.06(.12)	-.18(.12)	2.69(.09)**
Other qualification	-1.45(.23)**	-.65(.03)**	-1.41(.05)**
Number of children in family unit	0.20(.01)**		
Full time student	3.96(.06)**		
Disabled	1.87(.03)**	-.20(.02)**	
Getting pension	.31(.05)**	-.45(.05)**	
Single parent	-.002(.04)	-.10(.03)**	

261

Table A2.2:   Contextual effects: statistical significance of the amount of variance explained

A. Probability of being economically inactive (or long term unemployed) vs. probability of being in unskilled jobs (or short term unemployed). Estimation of variance components (also in part B and C)

	Random intercepts and random slopes			contextual effects of immigration			contextual effects of immigration and industries		
	Var. Xomp.Square	Chi Square	P Value	Var. Xomp.Square	Chi Square	P Value	Var. Xomp. Square	Chi Square	P Value
Intercept	0.052	451.0	0.000	0.050	418.4	0.000	0.036	318.5	0.000
Immigrants	0.133	234.4	0.005	0.143	218.9	0.022	0.106	201.4	0.062
British Minority	0.099	246.4	0.001	0.105	241.6	0.001	0.121	239.2	0.001
Education level 2	0.011	154.9	>.500						
Education below level 2	0.057	270.7	0.000	0.040	263.0	0.000	0.025	229.1	0.003
Muslim	0.353	245.9	0.001	0.377	251.2	0.000	0.355	242.9	0.000

B. Probability of being in semi-skilled or lower supervisory occupations (class V and VI) vs. probability of being in unskilled jobs (or short term unemployed).

	Var. Xomp.Square	Chi Square	P Value	Var. Xomp.Square	Chi Square	P Value	Var. Xomp. Square	Chi Square	P Value
Intercept	0.011	227.9	.00	.011	266.6	.00	.006	200	.09
Immigrants	0.129	227.7	.00	.096	249.3	.00	.059	218	.02
British Minority	0.038	150.2	>.50						
Education level 2	0.015	161.1	.29						
Education below level 2	0.027	204.4	.03	.019	221.2	.02	.008	182	.33
Religion other than Muslim	0.059	161.5	.28						
Muslim	0.156	179.3	.06	.132	220.4	.02	.137	217	.02

C. Probability of being in class I to III vs. probability of being in unskilled jobs (or short term unemployed)

	Var. Xomp.Square	Chi Square	P Value	Var. Xomp.Square	Chi Square	P Value	Var. Xomp. Square	Chi Square	P Value
Intercept	0.157	1297.9	0.000	.129	1246.2	.000	.021	536.9	.000
Immigrants	0.274	378.6	0.000	.261	353.2	.000	.189	429.5	.000
British Minority	0.092	245.5	0.015	.088	242.5	.015	.101	367.5	.024
Education level 2	0.026	223.3	0.124						
Education below level 2	0.057	333.9	0.000	.028	272	.000	.019	373.4	.013
Muslim	0.243	223.3	0.124						

Is Recent Immigrant Clustering in Montréal, Toronto and Vancouver Part of the Reason Behind Declining Immigrant Neighbourhood Quality?

Michael Haan

1. Introduction

In recent decades, nearly three-fourths of all Canadian immigrant arrivals have gone to Montréal, Toronto, or Vancouver. Their impact in these cities can not be over-stated; during 1996 to 2001, Montréal gained 126,000 newcomers, Vancouver attracted 180,000, and Toronto received a substantial 445,000 new arrivals, or roughly 10 per cent of its overall population.[1]

As the number of immigrants in these metropolitan areas increased, immigrants' overall levels of wellbeing have declined. In recent years, Canadian immigrants have fared worse in terms of earnings (Abdurrahman/Skuterud, 2004; Baker/Benjamin, 1994; Bloom et al., 1995; Frenette/Morissette, 2003), employment mismatch (Boyd/Thomas, 2001; Li et al., 2006), neighbourhood quality (Fong/Wilkes, 2003; Hou/Picot, 2003), and homeownership (Haan, 2005). Although city choice has not been cited as a primary reason for these changes, given that most recent immigrants live in Montréal, Toronto, or Vancouver, it is quite likely that most of the changes in immigrant wellbeing in Canada have occurred in one of its three 'gateway' cities.

Because many aspects of an immigrant's life are shaped by the city and neighbourhood in which he/she lives (Hyndman et al., 2006; McDonald, 2003; Sampson, 2008; Wilson, 1987), it is plausible that the choice to live in Montréal, Toronto, or Vancouver might have some ill effects, due in part to the neighbour-hoods in which immigrants reside. That is not to say that the effects are entirely negative – immigrants in big cities are, after all, more likely to have access to ethnic

---

1 These figures are for entire census metropolitan areas. According to Statistics Canada's definitions, a census metropolitan area consists of one or more neighbouring municipalities situated around a major urban core. A census metropolitan area must have a total population of at least 100,000 and the urban core must have at least 50,000. Several terms are used interchangeably in this paper for the purposes of style and brevity. First, 'cities' is used to refer to census metropolitan areas (CMAs); second, Montréal, Toronto and Vancouver are referred to as "gateway" cities, and all other CMAs are referred to as 'non-gateway' cities. Third, "neighbourhood" is used in place of census tract.

goods and services, a social support network, and opportunities in the ethnic economy – but that there may be a trade-off. If this is true, a worthwhile question to ask is whether immigrants would gain access to a better life in Canada by moving out of its three gateway cities.

Accordingly, this paper identifies the extent to which movement out of gateway cities would affect neighbourhood quality, a major component of immigrant well-being.[2] The 2001 census of Canada master file and ordinary least-squares regression techniques are used to compare neighbourhood quality, defined in terms of 1) median neighbourhood income, 2) concentration of low-income households, and 3) the percentage of houses in need of major repair. All of these are measured at the level of the census tract, and compared between Canada's gateway and non-gateway cities.

2. Literature review: Why Assess Wellbeing with Neighbourhood Quality?

Neighbourhood quality has been widely used to study wellbeing in the social sciences, and not only plays a fundamental role in determining social and economic vitality (Logan et al., 2002; Massey/Denton, 1985), but is also a primary mechanism behind social stratification (Fong, 1996; Massey, 2001; Massey/Denton, 1993; Myles/Hou, 2004; South/Crowder, 1998).

More recently, a debate about the effect of neighbourhoods has been reinvigorated with the Moving to Opportunity (MTO) housing mobility experiment in the United States (Clampet-Lundquist/Massey, 2008; Ludwig et al., 2008; Sampson, 2008). Essentially, the experiment randomly allocated residents of public housing in five U.S. cities into low-poverty neighborhoods (which could have no more than 10 per cent poor). Researchers then collected data on the socioeconomic wellbeing of residents, and compared them to a control group. The experimental design of the MTO demonstration has provided social researchers with a unique opportunity to definitively measure and to understand the impacts of a change in neighbourhood on the social well-being of low-income families. The logic behind the experiment dates back to the Chicago school of sociology, but has recently been reinvigorated with the Moving to Opportunity data, and has reminded social scientists about the importance of urban ecology. Although impact evaluation is ongoing, early results suggest that the MTO demonstration has been a success in several areas.

---

2 Clearly, neighbourhood quality is only one of many potential characteristics that could be used to assess the wellbeing of immigrants. Other indicators that would be worthy of investigation include earnings, employment status and suitability, and homeownership rates, and other research currently underway by the author looks at these characteristics.

As Hou and Picot (2003) and Fong and colleagues (Fong/Gulia, 1996, 1999; Fong et al., 2003; Fong/Wilkes, 2003) have shown, neighbourhoods vary widely across Canada, suggesting that there are reasons to believe that neighbourhood quality would improve for immigrants in a non-gateway city. First, there could be better employment options, providing a family with the necessary boost in resources to achieve residential mobility. Second, the wide differences in the price of housing – with some of Canada's most expensive housing located in its gateway cities – suggests that similar amounts of economic resources in a gateway city could produce quite different levels of affluence, and, quite likely, neighbourhood quality, than in some non-gateway cities.

At the same time, however, it is possible that neighbourhood quality would not automatically improve just by leaving a gateway city – after all, every city has undesirable neighbourhoods. A family that leaves a disadvantaged neighbourhood in one of Canada's gateway cities could find themselves in a disadvantaged neighbourhood in another city. If the transfer is in many cases lateral, the concentration of immigrants in gateway cities would likely have little impact on neighbourhood quality.

Defining Neighbourhood Quality

Typically, neighbourhood attainment research has pursued one of two possible directions. First, by defining "quality" as either the type and/or number of amenities in a neighbourhood, one vein of research focuses on a *neighbourhood's physical aspects.* By looking at the age, quality, and condition of a neighbourhood's built environment, researchers can assess the physical attributes of the space within which people live their lives.

This area has been quite lively in the social sciences, with a reinvigorated debate emerging more recently, as discussed above. One of the unresolved issues is deciding how to measure neighbourhood quality. One side tends to focus on the physical traits. Originating in 1982 with an influential article by the criminologists Kellner and Wilson, the crux of the "broken windows theory" is that the perception of disorder will, over time, breed disorder. Although originally focused on crime prevention, this literature has been extended to suggest that repairing broken windows will have positive consequences beyond crime prevention, and that the physical aspects of a neighbourhood are important for shaping opportunity (Galster et al., 1999; Hou/Picot, 2003; Massey/Denton, 1993).

Alternatively, it is possible to look at the *neighbourhood's social aspects*, or the characteristics of a neighbourhood's residents (Goffman, 1963; Sampson/ Raudenbush, 1999). Typically, this refers to the type of people that are likely to live or congregate in a particular neighbourhood, and the behaviours that they are likely to exhibit in public spaces (Goffman, 1963). Examples of negative social aspects could

include verbal harassment on the street, open solicitation for prostitution, public intoxication, and rowdy groups of young males in public (Sampson/Raudenbush, 1999), as well as more commonly measured factors like income or education (Massey/Fong, 1990).

One of the challenges of studying neighbourhoods (using either physical or social indicators), lies in determining what exactly constitutes a "good" or "bad" neighbourhood. A common strategy is to use the median income of a neighbourhood (Logan/Alba, 1995; Massey/Fong, 1990; Myles/Hou, 2003), operating on the assumption that higher median income proxies access to better amenities, housing, and higher average human capital. Another related strategy is to use median housing value, positing that a higher mean or median value is positively correlated with other desirable neighbourhood traits (Deng et al., 2002). Related to this, in Canadian research it is possible to use the percentage of people below the low-income cut-off (Oreopolous, 2002) or below the low-income measure (Frenette et al., 2004) in a neighbourhood.

A final potential measure of neighbourhood quality often used by, largely U.S., researchers includes measures of racial isolation or segregation (Alba/Logan, 1993; Alba et al., 2003; Iceland et al., 2002; Massey, 1985). Although this research is quite informative in the United States, the meaning and significance of "segregation" in Canada is not as clear. First of all, given the high proportion of immigrants coming to Canada with university degrees, there is little reason to believe that neighbourhoods with a high proportion of immigrants or people of visible minority status are at a disadvantage in terms of human capital. Finally, the focus is primarily on the social aspects of a neighbourhood, and given the high proportion of visible minorities in virtually all Canadian cities, observed differences are likely to mean more in the United States than in Canada.

In an attempt to incorporate both social and physical aspects in this study, I index neighbourhood quality with three factors. The first, median neighbourhood income, is intended to reflect typical levels of wealth and affluence. Second, the percentage of families living below the low-income cut-off (LICO), although similar in nature to studying median income, attempts to capture the *concentration* of poverty in a neighbourhood (rather than just the level). The third indicator, percentage of houses in need of major repair, partially measures a neighbourhood's level of physical disrepair.

For each of these indicators, the primary question is whether an immigrant's plight in 2001 would improve by moving out of Montréal, Toronto, or Vancouver, relative to Canadian citizens at birth. A casual look at the data suggests that it might; tables 1, 2, and 3 below compare each of the three indicators between immigrants (who have been in Canada for 20 years or less) and the Canadian-born (residents who are Canadian citizens at birth) across gateway and non-gateway cities.

Table 1:   Median neighbourhood income across gateway/non-gateway cities

	Gateway	Non-Gateway
Immigrant Average	$36,186	$37,818
Non-Immigrant Average	$37,611	$36,373

Source: Source: 2001 Census of Canada.
Note: Only contains households where the respondent is 25-65 years old.
These figures represent the median prevalence among immigrant/Canadian-born
 householders.

Looking first at median neighbourhood income, there is some reason to believe that neighbourhood quality would significantly improve for immigrants in Canada's non-gateway cities. Average median neighbourhood income for gateway immigrants is $36,200, but for non-gateway immigrants it is $1,600 above this amount. Although the median also differs for the Canadian citizen at birth across gateway and non-gateway cities, the disparity is the inverse of that of immigrants, with gateway residents eclipsing their non-gateway counterparts by about $1,250.

Table 2:   Per cent below Low-Income Cut-off across gateway/non-gateway cities

	Gateway	Non-Gateway
Immigrant Average	18.8%	14.8%
Non-Immigrant Average	16.9%	15.1%

Source: Source: 2001 Census of Canada.
Note: Only contains households where the respondent is 25-65 years old. These
figures represent the low-income prevalence among immigrant/Canadian-born
 householders.

Similarly, the average immigrant in a gateway city lives in a neighbourhood where about 19 per cent of all residents are below the low-income cut-off line, compared to 17 per cent for their non-gateway counterparts. Unlike neighbourhood income, however, LICO rates are also higher for the native-born in gateway cities, although the difference between the two is only 1.8 percentage points.

Percentage of all houses in need of major repair across gateway/non-gateway cities

	Gateway	Non-Gateway
Immigrant Average	7.8%	6.8%
Non-Immigrant Average	7.8%	7.2%

Source: Source: 2001 Census of Canada.
Note: Only contains households where the respondent is 25-65 years old. These figures represent the need for major dwelling repair among immigrant/Canadian-born householders.

Of all three indicators of neighbourhood quality, the percentage of houses in need of repair is the only indicator where immigrants actually fare better in one instance than do the native-born. In non-gateway cities, fewer houses in the neighbourhood require repair for the average immigrant than they do for a non-immigrant. In gateway cities, 7.8 per cent of houses are in need of repair in the average immigrant's neighbourhood, which is the same level as for Canadian citizens at birth.

Collectively, this evidence provides some reason to believe that neighbourhood quality (as measured by these three indicators) would improve by moving out of Montréal, Toronto, or Vancouver. Prior to assessing the extent to which this is the case, however, it is first necessary to discuss the data and methods that will be used in the remainder of this paper.

3. Methodology

Data

The primary data source for this project is the 2001 Census of Canada master file, available at the Statistics Canada headquarters in Ottawa, Canada. The confidential master file is a 20 per cent random sample of the Canadian population (rather than the roughly 3 per cent random sample available in public-use files), and is essential for this project to obtain the requisite levels of statistical power necessary for this type of analysis. Additionally, the master file contains census tract code identifiers for each record, which greatly facilitate the analysis of neighbourhood characteristics. For these reasons, the master file is better-suited for this type of analysis in comparison to the public-use version.

For this paper, the sample includes only one member (the highest earner who is between the age of 25 and 65) from each economic family.[3] This is done to reduce observational non-independence within families, and to reduce the disproportionate weight that a large family would have on results. Additionally, because households (rather than just individuals) typically move, it makes more sense to select one representative per household. Institutional residents, non-permanent residents, and those living in collective dwellings or military quarters are excluded from all analyses.

Variables

The models used to compare neighbourhood quality between gateway and non-gateway cities include life-cycle, immigration, and socioeconomic characteristics. The coding scheme for these variables is presented in Table 4.

Table 4:   Variable coding and descriptive statistics for statistical analysis

Age Group Characteristics		Mean
Age 25-34	Reference Category	0.23
Age 35-44	Dichotomous, 1=yes	0.32
Age 45-54	Dichotomous, 1=yes	0.27
Age 55-65	Dichotomous, 1=yes	0.17
Family and Household Structure		
Two Adults with Children	Reference Category	0.34
Two Adults without Children	Dichotomous, 1=yes	0.34
Lone Parent	Dichotomous, 1=yes	0.06
Unattached Individual	Dichotomous, 1=yes	0.26
Single Family Household	Reference Category	0.94
Multiple Family Household	Dichotomous, 1=yes	0.02
Non-Census Family Member	Dichotomous, 1=yes	0.04
Labour Market Characteristics		
Unemployed	Dichotomous, 1=yes	0.04
Employed Fulltime	Dichotomous, 1=yes	0.82
# Earners in Economic Family	Continuous	1.31
Income(Canadian dollars, logged)	Continuous	10.33
Self-Employed	Dichotomous, 1=yes	0.06

---

3 There are several possible ways to select one household member, including choosing the highest earner, the oldest person, or the primary maintainer. Some experimentation was done on person selection, and it was found to have relatively small effects on overall results. This is particularly true because all outcomes are measured at the neighbourhood level, and will therefore be the same regardless of who is chosen to represent the household.

Location of Household		
Gateway Census Metropolitan Area (CMA)	Dichotomous, 1=yes	0.52
Immigration Characteristics		
Immigrant	Dichotomous, 1=yes	0.27
Immigrant*Gateway CMA	Dichotomous, 1=yes	0.19
Speaks English/French	Dichotomous, 1=yes	0.99
Years Since Migration (YSM)	Continuous	5.70
Years Since Migration (YSM)-squared	Continuous	166.38
Socio-Economic Characteristics		
Education		
No High School	Reference Category	0.09
High School	Dichotomous, 1=yes	0.12
Post-Secondary Training	Dichotomous, 1=yes	0.44
University Degree	Dichotomous, 1=yes	0.26
Currently in School	Dichotomous, 1=yes	0.09
Visible Minority Status		
Black	Dichotomous, 1=yes	0.03
Chinese	Dichotomous, 1=yes	0.04
Filipino	Dichotomous, 1=yes	0.01
Japanese	Dichotomous, 1=yes	0.00
Korean	Dichotomous, 1=yes	0.00
Latino	Dichotomous, 1=yes	0.01
South Asian	Dichotomous, 1=yes	0.03
South East Asian	Dichotomous, 1=yes	0.01
Western Asia/Arab	Dichotomous, 1=yes	0.01
White	Reference Category	0.85
Other Visible Minority	Dichotomous, 1=yes	0.01
Dependent Variables		
Median Neighbourhood Income		$36,856.63
% living below LICO in neighbourhood		0.16
% of houses in neighbourhood requiring major repairs		0.07
Variables that are Unique to Selection Equation		
Same-group Size	Continuous, Logged	
Relevant Labour Market Size	Continuous, Logged	
Number of Occupations with Education Match	Continuous	
Variables that are Unique to Selection Equation		
Median Value (in $10,000 increments)	Continuous	
% Owner in CMA	Continuous	

Source: 2001 Census of Canada.

The motivation for including these variables reflects the premise that households choose neighbourhoods based on their needs and constraints. They will typically seek to optimize the quality of their neighbourhood whenever they can, and that their ability to do so rests heavily on the resources they have at their disposal.

Several possible statistical techniques could be used to estimate models that have aggregate measures as outcomes. After experimenting with more complicated techniques, including those that address the endogenous (instrumental-variable regression) or nested (nested regressions) nature of location choice, however, I chose to use the much simpler ordinary least squares (OLS) regression techniques. This choice stems from the similarity of results between the simpler and more complicated techniques, and the more straightforward interpretation of ordinary least-squares regression coefficients. Since the dependent variables are neighbour-hood-level measurements, it is necessary to correct standard errors for observational non-independence (every household in a neighbourhood will have the same value for all three outcomes), which is done easily in STATA using the cluster() option for OLS regression analysis. The basic model resembles the following:

Neighbourhood Quality = Gateway CMA + Immigrant + Immigrant · Gateway + Sex + Age + Family Type + Speaks English or French + Years Since Migration + Years Since Migration squared + Currently In School + Visible Minority Indicators + error term

This model is estimated for each of the three indicators of neighbourhood quality: (1) median income, (2) per cent below the low-income cut-off (LICO) for family income, and (3) per cent of dwellings in need of repair. Although all the regression coefficients are of interest, the coefficients for "Gateway CMA", "Immigrant" and "Immigrant · Gateway CMA" are the primary focus. "Gateway CMA" refers to the difference between Gateway and non-Gateway Census Metropolitan Areas (CMAs) for Canadian citizens at birth, "Immigrant" denotes the difference between and immigrants and non-immigrants in non-gateway centres, and "Immigrant · Gateway CMA" indicates the position of immigrants in gateway CMAs, relative to Canadian citizens at birth. It is this third coefficient that denotes the extent to which immigrant neighbourhood quality is affected by living in a gateway CMA.

4. Results

In table 5 below, three sets of regression results are presented that estimate the effect of several demographic, economic, and social variables on the three indicators of neighbourhood quality described above. The first column shows a vector of coefficients for median neighbourhood income, followed by those for percentage below LICO and percentage of houses in need of major repair.

Table 5: Indicators of neighbourhood quality as measured by median income, Low-Income Prevalence, and proportion of houses in disrepair: Regression results

	Median Income	LICO Prevalence	% of Houses that Need Repair
Age Group Characteristics			
35-44	697.870***	-0.009***	-0.003***
45-54	1,125.299***	-0.011***	-0.004***
55-65	1,869.018***	-0.021***	-0.007***
Family and Household Stucture			
2 Adults no Children	-1,793.952***	0.022***	0.007***
Lone Parent	-1,159.985***	0.019***	0.006***
Unattached Individual	-2,868.334***	0.048***	0.014***
Multiple Family Dwelling	-650.761***	0.001	0.00
Non-Family Dwelling	-110.881	0.00	0.005***
Labour Market Characteristics			
Unemployed	-1,370.404***	0.021***	0.004***
Employed Fulltime	-158.015*	-0.012***	-0.001*
# Earners in Economic	294.836***	-0.005***	-0.002***
Income (logged)	2,614.695***	-0.023***	-0.004***
Self-employed	1,593.245***	-0.01***	0.002**
Location of Household			
Lives in a Gateway CMA	1,001.175***	0.019***	0.005***
Immigration Characteristics			
Immigrant	-955.816***	0.024***	0.005***
Immigrant*Gateway	-1,771.91***	0.013***	0.005**
Speaks English/French	298.722	-0.006	-0.003
Years Since Migration	165.051***	-0.002***	-0.001***
YSM-Squared	-1.646***	0.00***	0.00***
Education			
High School Diploma	982.636***	-0.011***	-0.006***
Post Secondary	2,226.054***	-0.021***	-0.006***
University Degree	5,002.955***	-0.026***	-0.006***
Currently in School	-276.857**	0.003**	0.002**
Visible Minority Status			
Blacks	-3,197.683***	0.040***	0.004*
Chinese	-176.069	0.010	-0.006
Filipino	-3,520.734***	0.033***	0.010***
Japanese	1,567.48**	-0.003	0.005
Korean	1,363.602	0.001	-0.004
Latino	-3,387.011***	0.039***	0.006**
South Asian	-2,251.172***	0.015***	-0.005***
Southeast Asian	-4,095.76***	0.058***	0.009***
West Asian/Arab	-782.868**	0.018***	-0.004**
Other Visible Minority	-1,210.078***	0.005*	-0.004
Intercept	7,172.935***	0.419***	0.125***
Dependant Variable Mean	36,856.63	0.164	0.075
N Obs	110,320	110,320	110,320
R-squared	0.17	0.17	0.06

* p<0.1, ** p<0.05, *** p<0.01; Source: Source: 2001 Census of Canada; Note: Dependent variable means refer to mean neighbourhood level characteristics, LICO prevalence refers to the percentage of households below the low-income cut-off line. Estimates are corrected for clustering.

Looking first at household demographic characteristics, there appears to be a clear relationship between age, family structure, and neighbourhood quality. Compared to the reference group 25-34 year-olds, older households enjoy a higher median neighbourhood income. Furthermore, the prevalence of low income is diminished, and fewer houses require repairs among older households. Similarly, neighbourhood income is high for households that contain two adults and at least one child (the reference group), the prevalence of low income is reduced, and there are fewer houses in disrepair. In some cases, these differences are quite striking. For lone parents and unattached individuals, for example, median neighbourhood income declines by about $1,160 and $2,868 (respectively), the prevalence of low-income households increases by 2 and 5 percentage points, and the per cent of houses in need of repair increases somewhat. The results for multiple family and non-family dwellings are mixed, with multiple family dwellings experiencing lower median neighbourhood income (but no significant effects on the other two measures), and houses in need of repair is only weakly related to non-family dwelling status (but not median neighbourhood income and per cent LICO).

Labour market characteristics have roughly the expected effect on neighbourhood quality. Unemployment is linked to declines in all three indicators of neighbourhood quality. Increasing the number of earners in an economic family enhances quality, as does income, and entrepreneurship. The only somewhat surprising result is that full-time status slightly reduces median neighbourhood income.

Neighbourhood quality is significantly reduced for immigrants at time of entry (this can be determined by looking at the immigrant indicator), but improves with duration of residence in Canada. The years since migration (YSM) linear term points to an increase in neighbourhood income of $165 per year, with a slight but significant reduction in low-income prevalence and house repair rate with longer duration of residence in Canada. As the quadratic YSM term suggests, however, this improvement does not continue indefinitely, but gradually plateaus over time. Knowledge of English or French has no effect on neighbourhood characteristics whatsoever.

Both education and visible minority status seem to heavily influence neighbourhood quality. University degree holders gain access to neighbourhoods with a median income that is $5,000 higher than those without a high school diploma. Furthermore, the low-income prevalence of their neighbourhood is reduced by about 2.5 percentage points, and the percentage of houses in need of repair also shrinks slightly.

In terms of differential access to neighbourhood quality by ethnic-origin, for several groups there is a significant reduction that cannot be explained by other variables in the model. The median neighbourhood income of a Southeast Asian household, for example, is almost $4,100 below that of a comparable white house-

hold. The percentage of houses in need of repair is almost one percentage point higher, and the low-income prevalence rate is 6 percentage points higher. Although the differences are most striking for this group, they are followed closely by Blacks, Filipinos, Latinos, and South Asians. Japanese actually post higher median neighbourhood incomes than do whites, and are indistinguishable on the other counts. Koreans do not differ on all three measures.

With R^2 values of 0.17, 0.17, and 0.06, it seems that two of the dependent variables (income and low income prevalence) have more in common with each other than they do with houses in need of major repair. Although it is difficult to be certain, perhaps part of the reason for the difference is the subjective nature of "major repair", as not everyone would agree about what qualifies as a major repair.

Differences between Gateway and Non-Gateway Regions

Although it is possible to look at the coefficients in Table 5 to determine the extent to which the neighbourhoods of immigrants differ between gateway and non-gateway centres, it is perhaps easier to illustrate with predicted values. Holding all other values constant, the results below denote the differences in neighbourhood quality outcomes for immigrants and the Canadian-born in their regions of residence. [4]

Table 6: Predicted values for neighbourhood quality across gateway and non-gateway regions

		Median Neighbourhood Income	Per cent Living below Low-Income Cut-Off	Per cent in Need of Repair
Immigrant	non-Gateway	35,980.43	0.169	0.075
	Gateway	35,209.69	0.200	0.085
Non-Immigrant	non-Gateway	36,936.25	0.145	0.070
	Gateway	37,937.42	0.164	0.075

Source: 2001 Census of Canada.
Note: Only contains households where the respondent is 25-65 years old.

---

[4] The predicted values in Table 6 differ from the observed values in Tables 1 to 3 because Table 6 reports predicted values with all other explanatory variables held constant. The values shown in Tables 1 to 3 are based on observed households, which are affected by differences in actual observed values for other variables.

Looking first at median neighbourhood income, immigrants in non-gateway centres post slightly higher incomes than their gateway counterparts, whereas the opposite is true for the Canadian-born. [5] Although the differences are noteworthy (there's nearly $800 separating gateway from non-gateway regions), they're not astounding[6], and the gap is not as large as it is for Canadian citizens at birth, who have higher neighbourhood incomes in gateway centres.

Turning to low-income prevalence and per cent of houses requiring repair, there continue to be only small differences, with immigrants in gateway cities enduring slightly higher low-income prevalence and almost no difference in terms of housing quality. This compares to relative differences of 2 and 1/2 points for the Canadian-born.

Consequently, on all three counts there is a "gateway city penalty" for immigrants. Although it is difficult to say whether or not immigrants live in neighbourhoods that are the same as the Canadian-born, this analysis does provide some evidence that if immigrants chose to live solely in non-gateway areas, they would experience some increase in neighbourhood quality than if they stayed in their gateway centres.

Naturally, this conclusion is complicated by "equilibrium effects", or the fact that moving a household affects the calculation of neighbourhood quality in both the area they left and in their new destination. The primary purpose of this paper is not to provide a precise estimate for the degree of improvement, but rather to determine whether or not there is any evidence to indicate an improvement. These results suggest that there is a possible improvement, but that there would still likely be disparities between immigrants and Canadian-born even if all immigrants moved from Gateway CMAs to other areas.

5. Summary and Conclusions

As a large and growing body of literature has shown, immigrants have not done well economically in recent years in Canada (Boyd/Thomas, 2002; Frenette, 2002; Frenette/Morissette, 2003; Heisz, et al. 2002; Krahn et al., 2009; Picot/Sweetman, 2005).

---

5 A few qualifiers are necessary here. First, it is assumed that there is no unobserved heterogeneity across gateway and non-gateway populations. Second, when an immigrant leaves or enters a neighbourhood, the outcome variable for that neighbourhood does not change. In other words, moving from a Toronto neighbourhood to one in Edmonton does not change the calculated neighbourhood-level values for either neighbourhood.

6 Regarding statistical significance, inspection of t-tests revealed that all results are significant at $p<0.05$. Because of the large sample size, it makes sense to focus more on substantive interpretation than tests of statistical significance.

This decline is also evident with neighbourhood quality, even leading some to argue that certain immigrants groups are living in "near-ghettoes" (Murdie, 1994). Although many of the sources of hardship have been identified, there are some gaps in the empirical research literature. Furthermore, the sources that have been identified are often difficult or impossible to address through public policy. For example, Picot and Sweetman (2005) have cited changes in the characteristics of immigrants as one of the major explanatory factors behind declining labour market outcomes. Factors such as changes in language, source region, and visible minority status make integration considerably more difficult for more recent arrivals. Other factors include discounting of foreign work experience, and enhanced competition from the domestic labour force. For many of these factors, however, it is difficult to suggest policy measures that could be used to reverse the effect of these characteristics.

One possible alternative, recently proposed by Canada's former immigration minister Monty Solberg, is to encourage population movement into areas where labour markets, housing markets, and neighbourhoods are presumably more receptive to newcomers. By receiving a warmer welcome, immigrants would have better access to jobs that are commensurate with their skills, thereby improving their labour market status. This would put neighbourhoods of higher quality within reach, suggesting that immigrants who moved out of gateway cities could experience an overall boost in socioeconomic status.

Though it does not focus on immigrants, this prospect also underlies the Moving to Opportunity initiative mentioned earlier in the paper, and the considerable research within economics and health research that focuses on the power of positive peer effects. The essence of the argument is that individuals are partially products of their environments, in that they acquire not only attitudes and skills from those in their social space, but also access to opportunities and benefits. Given that this notion provides remedies to social issues such as the propensity to commit crime or to be poor, it is not surprising that there is so much interest in the relationship between individuals and their environments among policy researchers.

This paper extends this debate by asking whether Canadian immigrants would benefit from a better neighbourhood (as measured by median income, low-income prevalence, and houses in need of major repair) by choosing to live somewhere other than Montreal, Toronto, and Vancouver. I show that, for the average immigrant's neighbourhood, median neighbourhood income, concentration of poverty, and houses in disrepair are indeed different between gateway and non-gateway cities. This suggests that there are benefits to attracting immigrants out of gateway cities (Hyndman et al., 2006), and that policies with such a focus would yield some dividends.

Given that the primary reason behind location choice among immigrants is to live close to friends and family, in areas with other co-ethnic immigrants, and in areas that have historically received many earlier immigrants (Statistics Canada,

2003), it is quite difficult to attract immigrants away from gateway regions. That is not to say that it is impossible – at the time of writing, the province of New Brunswick (a lesser-known immigrant destination) has experienced nine straight quarters of successful immigrant recruitment, albeit for relatively small numbers of immigrants – but that a successful immigrant recruitment program is difficult, and is most successful when it can influence the destination choice for immigrants prior to their arrival in Canada. Although this is not currently the practice, more could be done to advertise Canada as a whole (rather than forcing immigrants to rely on what knowledge they've acquired themselves). What this must also include is a willingness to provide adequate settlement services, of which residential assistance is a critical part.

At the same time, the differences between gateway and non-gateway regions are slight, and given that neighbourhood quality differs between immigrants and Canadian citizens at birth in both gateway and non-gateway regions, it is at least as important to understand the factors that depress immigrant well-being in the cities in which they presently live. Simply moving people to other parts of Canada is not enough, as immigrants face worse neighbourhood quality in both areas. The Moving to Opportunity experiment demonstrates that vulnerable populations need additional assistance to overcome the barriers they face, and that equal access to opportunity (in the form of a free housing market) can, and has, produced inequality. This paper shows that moving immigrants around is, on its own, unlikely to alter this outcome.

References

Abdurrahman, A./ Skuterud, M. (2004): Explaining the Deteriorating Entry Earnings of Canada's Immigrant Cohorts: 1966-2000 (No. 225). Ottawa: Statistics Canada.

Alba, R./ Logan, J. (1993): Minority Proximity to Whites in Suburbs: An Individual-Level Analysis of Segregation. In: American Journal of Sociology 98(6), 1388-1427.

Alba, R./ Logan, J./ Stults, B. (2003): Residential Inequality and Segregation in an Immigration Era: An Analysis of Major U.S. Metropolitan Regions in 1990. In: J. Reitz (Ed.): Host Societies and the Reception of Immigrants. La Jolla: Center for Comparative Immigration Studies, 119-148.

Baker, M./ Benjamin, D. (1994): The Performance of Immigrants in the Canadian Labour Market. In: Journal of Labor Economics 12, 369-405.

Bloom, D.E./ Grenier, G./ Gunderson, M. (1995): The changing labour market position of Canadian immigrants. In: Canadian Journal of Economics 28(4b), 987-1005.

Boyd, M./ Thomas, D. (2001): Match or Mismatch? The Employment of Immigrant Engineers in Canada's Labor Force. In: Population Research and Policy Review 20(1-2), 107-133.

Boyd, M./ Thomas, D. (2002): Skilled Immigrant Labour: Country of Origin and the Occupational Locations of Male Engineers. In: Canadian Studies in Population 29(1), 71-99.

Clampet-Lundquist, S./ Massey, D. (2008): Neighborhood Effects on Economic Self-Sufficiency: A Reconsideration of the Moving to Opportunity Experiment. In: American Journal of Sociology 114(1), 107-143.

Deng, Y./ Ross, S.L./ and Wachter, S. (2002): Racial Differences in Homeownership: The Effect of Residential Location. In: Regional Science and Urban Economics 33(5), 517-556.

Fong, E. (1996): Attainment of Neighborhood Qualities among British, Chinese, and Black Immigrants in Toronto and Vancouver. 6, 123-145.

Fong, E./ Gulia, M. (1996): The Attainment of Neighborhood Qualities among British, Chinese, and Black Immigrants in Toronto and Vancouver. In: Research in Community Sociology 6, 123-145.

Fong, E./ Gulia, M. (1999): Differences in Neighborhood Qualities among Racial and Ethnic Groups in Canada. In: Sociological Inquiry 69(4), 575-598.

Fong, E./ Matsuo, T./ Wilkes, R. (2003): Disentangling the Residential Clustering of New Immigrant Groups in Suburbia.

Fong, E./ Wilkes, R. (2003): Racial and Ethnic Residential Patterns in Canada. In: Sociological Forum 18(4), 577-602.

Frenette, M. (2002): Do the Falling Earnings of Immigrants Apply to Self-Employed Immigrants? (No. 195): Analytic Studies Branch, Statistics Canada.

Frenette, M./ Morissette, R. (2003): Will they ever converge? Earnings of immigrant and Canadian-born workers over the last two decades (No. 215). Ottawa: Statistics Canada.

Frenette, M./ Picot, G./ Sceviour, R. (2004): How Long Do People Live in Low-Income Neighbourhoods?: Evidence for Toronto, Montreal and Vancouver. Ottawa: Statistics Canada.

Galster, G./ Metzger, K./ Waite, R. (1999): Neighbourhood Opportunity Structures of Immigrant Populations, 1980 and 1990. In: Housing Policy Debate 10, 395-442.

Goffman, E. (1963): Behavior in Public Places: Notes on the Social Organization of Gatherings. New York: Free Press.

Haan, M. (2005): The Decline of the Immigrant Homeownership Advantage: Life-Cycle, Declining Fortunes and Changing Housing Careers in Montreal, Toronto and Vancouver, 1981-2001. In: Urban Studies 42(12), 1-22.

Heisz, A./ Jackson, A./ Picot, G. (2002): Winners and Losers in the Labour Market of the 1990s (No. 184). Ottawa: Statistics Canada.

Hou, F./ Picot, G. (2003): Visible Minority Neighbourhood Enclaves and Labour Market Outcomes of Immigrants (No. 204). Ottawa: Analytic Studies Branch, Statistics Canada.

Hyndman, J./ Schuurman, N./ Fiedler, R. (2006): Size Matters: Attracting New Immigrants to Canadian Cities. In: Journal of International Migration and Integration 7(1), 1-25.

Iceland, J./ Weinberg, D.H./ Steinmetz, E. (2002): Racial and Ethnic Segregation in the United States: 1980-2000. Washington, DC: U.S. Government Printing Office.

Krahn, H./ Harrison, T./ Haan, M./ Johnston, W. (2009): Social Capital and Political Engagement in Canada. In: International Journal of Comparative Sociology 46(1), 29-54.

Li, C./ Gervais, G./ Duval, A. (2006): The Dynamics of over Qualification: Canada's Underemployed University Graduates. Ottawa: Statistics Canada.

Logan, J.R./ Alba, R.D. (1995): Who Lives in Affluent Suburbs? Racial Differences in Eleven Metropolitan Regions. In: Sociological Focus 28(4), 353-364.

Logan, J.R./ Alba, R.D./ Zhang, W. (2002): Immigrant Enclaves and Ethnic Communities in New York and Los Angeles. In: American Sociological Review 67(2), 299-322.

Ludwig, J./ Liebman, J.B./ Kling, J.R./ Duncan, G.J./ Katz, L.F./ Kessler, R.C. (2008): What Can We Learn about Neighborhood Effects from the Moving to Opportunity Experiment? In: American Journal of Sociology, 114(1), 144-188.

Massey, D.S. (1985): Ethnic Residential Segregation: A Theoretical Synthesis and Empirical Review. In: Sociology and Social Research 69(3), 315-350.

Massey, D.S. (2001): Segregation and Violent Crime in Urban America. In: Anderson, E./ Massey, D.S. (Eds.): Problem of the century: Racial stratification in the United States. New York: Russell Sage, 317-344.

Massey, D.S./ Denton, N.A. (1985): Spatial Assimilation as a Socioeconomic Outcome. In: American Sociological Review 50, 94-106.

Massey, D.S./ Denton, N.A. (1993): American Apartheid : Segregation and the Making of the Underclass. Cambridge, Mass.: Harvard University Press.

Massey, D.S./ Fong, E. (1990): Segregation and Neighborhood Quality: Blacks, Hispanics, and Asians in the San Francisco Metropolitan Area. In: Social Forces 69(1), 15-32.

McDonald, J.T. (2003): Location choice of new immigrants to Canada: The role of ethnic networks. In: Beach, C./ Green, A./ Reitz, J. (Eds.): Canadian Immigration Policy for the 21st Century. Montreal: McGill-Queen's University Press, 163–195.

Murdie, R. (1994): 'Blacks in near-ghettos?' Black visible minority population in Metropolitan Toronto Housing Authority public housing units. In: Housing Studies 9(4), 435-457.

Myles, J./ Hou, F. (2003): Neighbourhood Attainment and Residential Segregation Among Toronto's Visible Minorities (No. 206). Ottawa: Statistics Canada.

Myles, J./ Hou, F. (2004): Changing Colours: Neighbourhood Attainment and Residential Segregation Among Toronto's Visible Minorities. In: Canadian Journal of Sociology 29(1).

Oreopolous, P. (2002): Do Neighbourhoods Influence Long-Term Labour Market Success? (No. 185). Ottawa: Statistics Canada.

Picot, G./ Sweetman, A. (2005): The Deteriorating Economic Welfare of Immigrants and Possible Causes: Update 2005 (No. 262). Ottawa: Statistics Canada.

Sampson, R.J. (2008): Moving to Inequality: Neighborhood Effects and Experiments Meet Social Structure. In: American Journal of Sociology 114(1), 189-231.

Sampson, R.J./ Raudenbush, S.W. (1999): Systematic Social Observation of Public Spaces: A New Look at Disorder in Urban Neighborhoods. In: American Journal of Sociology 105(3), 603-651.

South, S.J./ Crowder, K.D. (1998): Leaving the 'Hood: Residential Mobility between Black, White, and Integrated Neighborhoods. In: American Sociological Review 63(1), 17-26.

Statistics Canada. (2003): Longitudinal Survey of Immigrants to Canada: Process, Progress and Prospects. Ottawa: Statistics Canada.

Wilson, W.J. (1987): The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy. Chicago: University of Chicago Press.

Return migration to East Germany - Motives and Potentials for Regional Development

Jenny Schmithals

1. Introduction

The reunification of Germany, accompanied by the rapid downfall of East German industries, led to major migration flows. The loss of population in East Germany is an issue that has been the focus of intense discussion in both political and media circles. This population decline is mainly the result of negative migration balances, which are caused more by low in-migration rates than by the exit rates, as the latter are not above average.

Migrants often act out of economic necessity, but may hold on to the idea of coming back as soon as possible. Empirical studies have shown that more than 50 % of East German migrants wish to return, and that return migration accounts for a high proportion of in-migration into the East German regions (see e.g., Beck, 2004; Dienel et al., 2004). Nevertheless, up to now there have been almost no studies that have analysed the factors that promote or constrain the chance of the general wish to return being realized and measures that might support return migration to East Germany.

Migration is a normal phenomenon, and, especially for young people, it allows them to gain experience and improve their job prospects. Therefore, discouraging migration cannot be a political objective. However, more balanced migration flows can definitely be desirable. In some European countries, return migration is already promoted broadly: Finland and Ireland have launched programmes for emigrants to make returning more appealing. Similar measures are underway in Mexico, China and India (cf. Hunger, 2003; Dienel et al., 2004). The main reason for these efforts is the awareness that the experience, the know-how and the capital of return migrants can represent valuable resources for the economic revival of the home region. Regarding the situation in East Germany creating attractive incentives for return migration and staying in East Germany could be a reasonable strategy for regional development: It can be assumed that increased return migration contributes to the revitalisation of the East German regions, and may thus encourage more people to move to those areas. Salzmann argues that migration to East Germany is

the only demographic variable that can be regulated actively, and which would have an immediate impact on population development (cf. Salzmann, 2009: 72).

In order to promote migration from West to East Germany, it is necessary to know more about the professional and private reasons for return migration. This paper presents the results of a research project[1] that examined the reasons for residential mobility in a case study through the evaluation of standardised interviews with immigrants to Magdeburg, a former industrial city in East Germany. The socio-demographic characteristics of the return migrants, as well as other factors, such as their work situations and their plans to stay in Magdeburg, were compared with those of other immigrants. The goal was not only to analyse the motives for return migration, but also to gather information about changes in the professional careers of return migrants, their feelings of satisfaction with the migration decision, and whether they plan to stay in Magdeburg, or to move again.

The findings are completed through the evaluation of biographic-intensive interviews with German migrants who have returned to East Germany. Preliminary theoretical findings on the reasons for migration are presented. Professional and private circumstances for staying or migrating form complex groups of motives. One of the central results is that local bonds are a decisive catalyst for return migration. These bonds include phenomena such as local or regional identity, as well as family ties or close ties of friendship.

2. Current state of research

2.1 Internal migration and return migration

Internal migration generally means migration within a defined area, such as a country or a region. The study presented in this paper considers migration flows within Germany across the borders of federal states. Internal migration is an important indicator of disparities between regions and the quality of certain locations. Thus, it is an important factor that has to be considered in regional policy. The loss of population through internal migration includes losses in the next generation: People are having and raising their children elsewhere (cf. Mai/Scharein, 2009). Furthermore, negative migration balances through internal migration can create a vicious circle: Towns and regions that lose inhabitants also become less attractive (Maretzke, 2009: 254).

---

1 Research project "Rückwanderung als dynamischer Faktor für ostdeutsche Städte (return migration as a dynamic factor for East German cities)," funded by the Federal Ministry of Transport, Building and Urban Affairs und carried out by the nexus Institut Berlin in cooperation with the University of Applied Sciences Magdeburg-Stendal and the University of Leipzig.

What is meant by return migration? Return migration takes place after a preceded exit and after a certain period of time (cf. Glettler, 2001). To fit the definition of return migration used in this paper, it is important that no return date was set when the migrant left the home country or home town. The length of time a return migrant lived in another place before returning is less crucial.

There is a lack of research on return migration within Germany (cf. Beck, 2004: 97; Dienel et al., 2007). Now, against the background of demographic change, internal migration in general, and return migration to East Germany in particular, are attracting increasing interest.

The population loss in East Germany would be much more severe if it were not compensated for to some extent by people who migrate from West to East. Since the year 1989, West-East migration increased continuously, and remained stable from the year 1996 onwards: Around 100,000 persons move annually from West to East Germany (see Beck, 2004: 100; Mai, 2007: 248). A total of 2.18 million people moved from East Germany to West Germany between 1991 and 2004, while 1.28 million people moved from West to East in the same period of time. Thus the East-West migration resulted in a population deficit of around 900,000 people (cf. Grün-heid, 2009: 33). At around 50 %, return migration accounts for a high proportion of in-migration into the East German regions (see Beck, 2004: 106).

2.1.1 Migration Theories

Although return migration is mentioned early, as by Ravenstein in his "laws of migration" (1885, 1889), this phenomenon was largely neglected in the 20th century. Recently, against the background of European transformation processes, such as the EU enlargement to the East, issues surrounding return migration and circular migration have attracted greater interest. The number of empirical studies on return migration has been increasing, but so far there has been no broad in-depth theoretical framework for return migration.

As long as the theoretical framework of return migration is still in its infancy, general migration theories offer one perspective from which to understand remigration processes. Several existing approaches deal with the question of why people move from one region to another, including system-oriented, action-oriented and integrated approaches.

In the past, there has been a strong tendency to use economic reasons to explain migration processes, such as the prospect of finding better job opportunities, salary levels, or infrastructure quality in the new location. However, some recent studies have pointed out the significance of personal factors, such as family ties or other social networks (cf. Steiner, 2004: 43). Furthermore, migration decisions normally are not individual decisions, but are made within the context of

an individual's family or partnership. Thus, the question of whether the whole family is happy with the new place of residence appears to be an important factor. (cf. Pethe, 2004).

Approaches that only look at individual reasons for migration, or that only focus on the contextual situation, are of limited explanatory value. One approach that leads to reasonable explanations is the push-pull model. According to Lee (1966) and other authors,[2] push factors are factors associated with the area of origin, whereas pull factors are associated with the area of destination. Originally, the push-pull model was system-oriented, and followed Ravenstein's neoclassical considerations: Ravenstein (1885, 1889) assumed that the main currents of migration flow from regions with fewer opportunities to regions with better prospects. Lee was one of the first researchers who broadened the approach and pointed out the significance of both intervening obstacles and personal factors, and thus acknowledged that the decision to migrate normally is not completely rational. Lee (ibid.) also formulated the thesis that every main migration flow generates a counter flow, which is smaller than the initial flow (cf. Ravenstein, 1885, 1889). He specified several reasons for this:

- The acquisition of new attributes at destination that the migrants gain often allows them to return on improved terms;
- Migrants become aware of opportunities at origin that they had not taken advantage of before, or they may use their contacts in the new area to set up business in in their home area; and
- It is likely that children born at destination will accompany the return migrants, as may other people who have become aware of opportunities at the place of origin through the migrants (Lee, 1966: 22).

Another approach that is useful in explaining return migration is the social network theory. On the one hand, this theory is useful for describing how the adaptation processes which take place after emigrants return to their home countries can be sustained. On the other hand, it contributes to the analysis of the initiation of return migration processes. It can especially be applied to remigration decisions that are influenced by emotional ties. Hanafi, for example, names "the nuclear and the extended family" as major players in migration decisions (Hanafi, 2005: 59).

Currently most migration researchers assume that societal preconditions have a significant impact on individual migration behaviour, and that these preconditions can function as external constraints. Hence, migration processes can only be analysed in the context of the surrounding social systems (cf. e.g., Bähr, 2004; Desbarats, 1983; Weichhart, 1993;. Werlen, 1995). Models based on this assumption

---

2 E.g., Bähr (2004); Cebula (1981); Kalter (1997); Kaplan (1995); Treibel (1999).

are called constraints models. Comparable to the push-pull model, they integrate personal and system-oriented perspectives.

2.1.2 Different types of return migration

In some studies that deal with international return migration processes, typologies of different types of return migration or return migrants have been developed. These typologies are typically differentiated according to the motive for migration they focus on. In the following, an attempt to summarize these typologies is presented (cf. also Dienel et al., 2007; Schmithals, 2008). The different types cannot be separated from each other sharply:

1) The first type that is described in several typologies consists of persons who have been successful in their professional lives after leaving their home regions. They either remigrate after terminating their career (when they retire or even later), or they are able to combine the return with a successful professional change. Those who found good job opportunities abroad or were successfully self-employed, but who saved enough money to allow them to settle down in their home regions, are called "conservative remigrants" by Cerase (1967). These migrants had always intended to return, and the realisation of this intention can be seen as a calculated strategy. Unger (1983) calls the same type "traditional return migration" (cf. also Schrettenbrunner, 1986; Bürkner et al., 1988). Beck (2004) characterizes these return migrants as persons who have achieved the goals they set for themselves when leaving their home regions, and especially the socioeconomic advancements they had hoped to make (cf. Cassarino, 2004).

   Cerase (1967) differentiates between "conservative" and the "innovative" return migration. The "innovative remigrants" have not yet decided that they will definitely return at the time of going abroad. Instead, they reconsider their professional opportunities from time to time, and, being prepared to move again, compare those they have at the place of residence with those they would have in their home region, and even with those in other places. They only return when they are convinced that this decision improves their prospects. The "innovative remigrants" are likely to bring back capital and/or experiences that are particularly valuable (see e.g., Findlay, 1988; Findlay/Gould, 1989; Pethe, 2004).

2) Persons who do not remigrate before they retire constitute another group in Cerases typology: the "retirement remigrants." Both Beck (2004) and Born et al. (2004) refer to this type, and try to identify the particular characteristics of these return migrants: It is assumed that the "retirement remigrants" have sufficient time and capital to consume and to be involved in the society (see also Schrettenbrunner, 1986; Bürkner et al., 1988).

3) Cerase (1967) assumes that migrants who are successful in their professional careers stay at the new place of residence at least for a certain amount of time. When persons return because of problems in the initial period after migrating (either professional difficulties or a lack of social integration in the host society), Cerase speaks of "return due to failure" (see also Agunias, 2006; Schrettenbrunner, 1986; Bürkner et al., 1988). Unger (1983) calls return migration that is caused by unemployment or unsatisfactory working conditions "structural return migration."

4) Unger (ibid.) distinguishes another type that she calls "return for family reasons." The "family remigrants" return irrespective of their professional success or social integration because of urgent familial reasons, such as parents in need of care.

There are some more types which can be found in the literature that overlap with the types already described, and which focus on one specific feature, such as "next generation remigrants," or children of parents who went abroad, and who then return to the area of their family's origin (Ramos, 2003). Another type that can be identified is "vocational or student remigrants" who return after earning their final degree ("brain return," see Brecht, 1995; Mai, 2004), "emotional remigrants" who return because of homesickness (see Blechner, 1998; Hannken, 2004), or return migrants who come back to their home regions because they inherited family property (see von Reichert, 2002; Newbold/Bell, 2001; Shumway/Hall, 1996).

The synopsis shows that, even though the specific typologies differ from each other, there are some structural similarities: the typologies are based on the assumption that migration decisions normally follow voluntary decisions, in contrast, for example, to asylum seekers whose return is forced by authorities that reject the application for asylum. In addition, it is apparent that economic motives are seen as important factors that influence migration processes in general, whereas private motives seem to play a special role in return migration decisions.

2.2 Local bonds as motivation for return migration

There are many terms that refer to the ties between people and places: local, cultural, regional or place identity, as well as local bonds or regional consciousness (cf. Lilli/Diehl, 1999; Kaiser, 1993; Pohl, 1993; Wagner, 1989). All these terms refer both to spatial elements (such as a landscape, a quarter or an apartment) and to social ties. It is hardly possible to quantify these bonds or identities, but the knowledge that they exist helps to explain why it is not feasible to interpret migration decisions only with rational choice approaches.

In connection with research on return migration, the term "local bonds" seems to be the most suitable, because it directly refers to an existing bond between a person and a place, which is more than an imaginary construct. The term can be applied to interrelations between people and places that exist across distances.

One further assumption is that, against the background of globalization and increasing mobility demands, local bonds and the feeling of cultural belonging do not disappear, but may become even more important because people need a kind of "anchor" for their own identity (cf. Migremus n.d.: 9). The OECD (2001) observed rising levels of social capital in Germany and in some other countries, which was indicated, for example, by increasing levels of formal participation and informal sociability. This anchor is, however, changeable as individuals cultivate varying contacts and friendships in the course of their lives: They participate in different institutions and social communities, and thus they are bound to changing social environments.

According to Schmied (1985), local bonds are crucial for local and regional development, as they may counteract exit migration or promote participatory activities and personal responsibility for the community (cf. Filsinger, 2002; Langer, 2004). There is a broad consensus that social capital, understood as the connections and relationships between people living in the same place, constitute an important element of these local bonds (cf. e.g., Bourdieu, 1991; Buchholt, 1998; Keupp, 1987).

Living together in a certain place may create an identity, and provide people with feelings of intimacy and safety. The place obtains its specific meaning through the people who act in it (cf. Mai, 1993; Wagner, 1989). Feelings of homelessness, by contrast, can be explained by anonymity and a lack of social relationships (see Buchholt, 1998; Schneider/Spellerberg, 1999; Röllin/Preibisch, 1993).

According to Mead (1973), identity is only imaginable within a social community. Habits and conventions emerge from collective actions, and these, along with traditions, act as regulators, thus becoming part of the socio-spatial identity. This understanding leads to a dynamic concept of identity: As identity refers to actions, it changes and can never be stable.

Strong local social capital is likely to promote regional development, not only for emotional reasons, but also because it can bind individuals together for their mutual benefit (cf. Falk/Kilpatrick, 2000; Mohan/Mohan, 2002; Putnam, 2000; Woolcock, 1998).

There is a special debate on regional identity relating to East Germany: It is often stated that, because of the drastic change caused by reunification, there is a specific need for individuals to become aware of their own strengths and particular skills. However, West-East comparative studies do not identify significant differences concerning regional consciousness or local bonds (see Kalter, 1997; Schneider/Spellerberg, 1999).

3. Data and Methods

Magdeburg has been chosen for the case study because it is a typical former industrial city that lost a lot of employment opportunities in the course of deindustrialization processes after the reunification of Germany, and, along with this loss of jobs, a lot of inhabitants: In 1990, around 280,000 people lived in Magdeburg, compared with less than 230,000 today (the latest statistics show 229,631 inhabitants living in Magdeburg in December 2007).

Especially young and employable people left Magdeburg. Attractors are a university and a university of applied science. Together they offer places for 16,000 students. However, many young people leave Magdeburg after graduating from university because it is difficult to find adequate job opportunities.

In 2005, the population increased slightly for the first time after reunification in relation to the preceding year. What factors led to this development? One explanation is the upgrading of Magdeburg: Since reunification, the city has had to cope with a negative image. There is some evidence that town planning measures and improvements in cultural and social life, as well as better educational opportunities, have resulted in a changing perception of the city. Furthermore, the development could be similar to a phenomenon that Dinkel and Salzmann described in Mecklenburg-Western Pomerania: in the 1990s, the rate of young people leaving East Germany after graduating from school was high. Now people are graduating who were born in years with a low birth rate. Thus, the number of young people who are becoming old enough to migrate is declining (cf. Dinkel/Salzmann, 2007: 1028).

A standardized survey of people who moved to Magdeburg in 2003 and 2004 was conducted at the university of applied science in Magdeburg in spring of 2006, and was used to identify those who had lived in Magdeburg previously. The registration of address office provided the university with the addresses of all persons that had moved to Magdeburg in the denoted years. Eight university students attempted to get the telephone numbers of these individuals, and then conducted the interviews by telephone. People who lived in another town in Saxony-Anhalt before moving to Magdeburg have been excluded from the survey. The average length of each standardized interview was 30 minutes.

Table 1:   Course of survey

Target population: Return migrants and other migrants who moved to Magdeburg	
↓	↓
Main unit:Persons who moved to Magdeburg in 2003 and 2004 and who did not live in Saxony-Anhalt before	**3,416 persons** aged over 15 who were registered in the registration of address office
↓	↓
Main unit of the survey: All persons who could be reched during the survey period	**574 persons**, whose telephone numbers were found
↓	↓
Return rate: All interviews that could be carried out	**457 interviews** (79.6 %)
↓	↓
Usable quota (less incomplete interviews)	**449 interviews** (78.2 %)

The course of survey is shown in Table 1. 1,643 persons moved to Magdeburg in 2003, while 1,773 immigrated in 2004. Thus the main unit of return migrants and other migrants has been a number of altogether 3,416 persons. The telephone numbers of only 574 persons were found, and 449 usable interviews could be carried out.

Of 443 interviewees, 132 were identified as return migrants. The socio-demographic characteristics of the remigrants, as well as other factors, such as their work situations or their plans to stay in Magdeburg, were compared with those of the other immigrants.

The analysis was supplemented by biographic-intensive interviews with 32 return migrants to deepen our knowledge about individual motives and back-grounds for return migration decisions. The interview concept integrated elements of narrative, problem-centred and episodic interviews. Guiding questions were used to ensure that all important questions were addressed. Thus the interviews can be characterized as semi-standardized. The questions were formulated to be as open as possible, and the sequence followed the answers of the interviewed person. The open character of the interviews allows us to analyze the complex patterns of decision making, and is especially suitable for the examination of migration (cf. A. Steinführer 2004). The return migrants were asked why they left Magdeburg originally, what motives had been crucial in the decision to return, what they think about their lives after returning, and what their future plans are. The interviews

were recorded and transcribed. The interpretation followed the "grounded theory" method (cf. e.g., Glaser/Strauss, 1967; Strauss/Corbin, 1996; Witzel, 2000).

4. Results

4.1 Origin

The last place of residence of the remigrants, as well as of the other migrants, was, in most cases, in West Germany: More than 70 % of the remigrants and 52 % of the other migrants had lived in West Germany before moving to Magdeburg, nearly 25 % of the remigrants and around 40 % of the other migrants had lived in other East German federal states, and around 5 % of both remigrants and other migrants had lived in foreign countries.

4.2 Age structure of the remigrants compared to other migrants

The age structure of the remigrants shows two focal points: The largest group of remigrants is between 25 and 29 years old. There is also a relatively large group of migrants aged 55 and above (see Figure 1).

The age structure of the other migrants differs clearly: Here it is evident that most of the migrants are young persons, aged 20 to 29. Only a few migrants are older than age 40 (see Figure 2).

Return migrants who return to Magdeburg are, on average, 10 years older than other migrants. One explanation for this is that retired persons have special reasons for return migration: The analysis of the biographic interviews showed, for example, that some remigrants who left their home region for economic reasons had always wanted to return, and finally realized this wish when they retired and had another opportunity to migrate. Others returned in order to live close to other relatives after becoming a widow or a widower. These motives are, of course, irrelevant for people who had not lived in Magdeburg before. The central attractions of Magdeburg are the university and the university of applied science, and a high percentage of the migrants who had not lived in Magdeburg previously moved there to pursue higher education (see below). This finding explains the high proportion of young migrants. People who remigrate, of course, had migrated at least once before. This is another explanation for the higher average age of return migrants compared to other migrants.

*Figure 1:*   Age structure of the migrants and remigrants, absolute number.
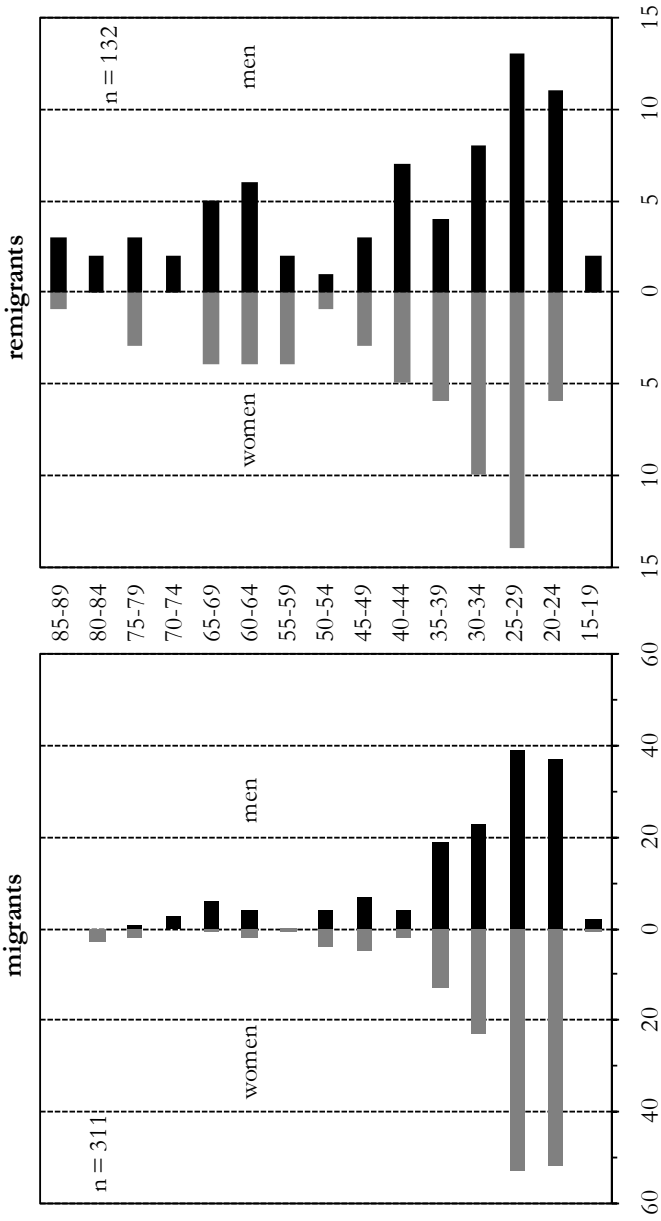
Source: Own calculations.

The percentage of unemployed persons is, at 17 %, much higher among remigrants than among the other migrants, among whom it is only 4 %. Among the latter, with or 43 % students constitute the biggest group.

The employed (re-)migrants were asked how satisfied they were with their job-related status, their salary, the work atmosphere, and their career prospects. Before moving to Magdeburg, more remigrants than other migrants had been satisfied with their employment conditions. After returning, fewer remigrants and more other migrants indicated they are satisfied (see Figure 3). These findings can be explained through another finding: For many remigrants, private reasons are crucial for the decision to return (see below). It is likely that they are therefore willing to accept worse working conditions. In contrast, the other migrants often move because of economic reasons.

Figure 2:   Employee satisfaction, numbers in per cent*
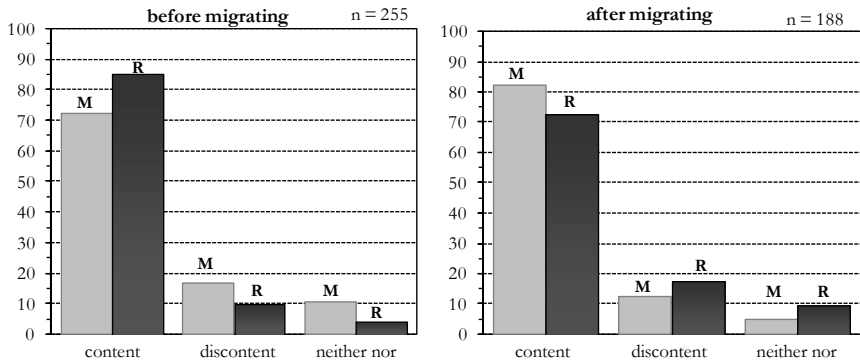
* **M** = migrants, **R** = remigrants.
Source: own calculations.

4.4 Reasons for Returning

The central result is that, for 60 % of the remigrants, private factors were crucial reasons that influenced the decision to return. Only for 30 % a job-related motive was central.

The motivational structures often are of a complex character. The central reason for returning, for example, may be emotional, but the decision to return may be triggered by becoming unemployed. Or people may realize their personal wish to

return only after finding new job opportunities in the old home region. For other returnees, job prospects do not matter at all.

The main private reasons for returning were the wish to live close to relatives or friends who remained in the area of origin, and special family motives, such as parents in need of care, and "homesickness."

Nearly all the remigrants with whom biographic interviews were conducted had left Magdeburg because of job-related motives, and returned because of private motives. They realized this migration desire as soon as they were given the opportunity; usually because they have retired or because they have found employment in their home region.

The results of the biographic-intensive interviews indicate that having children is an important motive for returning: Young parents, and especially single parents, seek family assistance in their new situation. Even for some childless remigrants, the prospect of having children influences the return migration decision: They prefer to start a family in their home region, where they have more social relations and where they can count on the support of their own parents.

Although the return migrants are prepared to accept worse working conditions, those who worked before usually are not willing return unless they can find employment. The return migrants often are successful in finding new jobs because of social networks. In most cases, private or professional networks, or both, were found to promote the return migration process. Conversely, leaving the home region normally does not follow social networks, and many migrants experience difficulties in building up new stable network structures at the new place of residence.

The analysis of the biographic interviews indicates that remigrants are flexible not only with regard to their mobility, but also in their professional lives. They are open to improving their skills or even retraining, and for this reason they succeed.

*4.5 Intentions of staying in Magdeburg*

When comparing plans to stay in Magdeburg among remigrants with those of other migrants, significant differences become apparent (see Figure 4): One-third of the migrants who did not live in Magdeburg previously intend to stay, one-third plan to migrate again, and another third are undecided. In contrast, most of the remigrants have decided to stay in Magdeburg.

Most of the interviewees assume that the question of whether they will stay or migrate again will be decided by their work situation. In addition, the professional prospects of the spouse or partner play an important role. Some of the interviewees also point to the importance of the development of the city of Magdeburg: Here it becomes apparent that not just job opportunities, but also infrastructure, such as

childcare, leisure facilities, or good schools and sufficient university places, are relevant for the attractiveness of a city.

The intention to stay or to migrate again corresponds with the age of the interviewees, irrespective of whether they lived in Magdeburg before or not: Younger people are less determined to stay than older persons.

Figure 3:   Intentions to stay in Magdeburg ('Do you plan to stay in Magde-burg?'), number in per cent
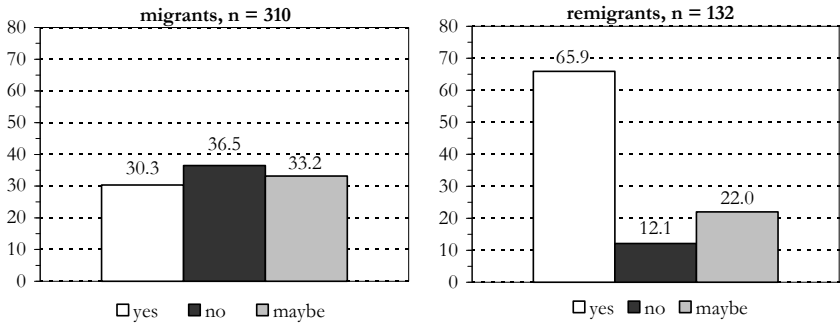
Source: own calculations.

4.6 Commuter Mobility

Local bonds seem to be not only a major motivation for return migration, but also for commuter mobility, and, in this context, the processes of return migration are closely associated with commuter mobility: For eight of the intensively interviewed remigrants, the results show a strong connection between the return migration decision and different forms of commuter mobility.

In the case of four interviewees with strong social ties binding them to Magdeburg, commuter mobility preceded return migration. After leaving Magde-burg, they maintained the connection intensively through frequent visits. If this form of commuter mobility turns out to be a burden, the need to commute can, according to the push-pull model, be seen as a push factor that promotes the return migration decision, and the causal social ties as a pull factor. A lack of social integration at the new domicile can also function as a push factor. Thus, commuter mobility in these cases can be seen as a pre-stage of later migration.

In the case of the other four interviewees, the remigrants have accepted that the return has led to commuter mobility: They returned even though they work elsewhere. Since returning, they have shared a place of residence with their family and/or friends, but now they have to commute to reach the place where they work.

5. Summary and conclusion

International studies show that the experiences, the know-how and the capital of return migrants can be a primary potential for the economic revival of the home region. The results of the presented research project point to the significance of return migration for East Germany: The return migrants can be characterized as having above average skill levels, and return migration to East Germany thus seems to constitute a kind of "brain return."

One-third of the persons who moved to Magdeburg in the years 2003 and 2004 had lived in Magdeburg previously, making them return migrants. Most of the return migrants, as well as most of the other migrants, had been living in West Germany prior to (re-)migrating to Magdeburg. One of the central results of the empirical studies is that return migration differs from other forms of migration with regard to age structure, employee satisfaction and plans to stay: Return migrants are, on average, 10 years older than other migrants, whereas only a few other migrants are older than 40. Most of the return migrants, but only 30 % of the other migrants, intend to stay in Magdeburg.

It is likely that return migration takes place in specific phases of life that may differ from those in which other forms of migration occur. Obviously the percentage of students is higher among the migrants who did not live in Magdeburg previously, and the percentage of older people is higher among the remigrants.

With regard to the reasons for return migration, it becomes apparent that private motives clearly play a bigger role than job-related motives. The results of the qualitative interviews indicate that many return migrants maintained close ties to the home region while living at another domicile, often by commuting. Using the push-pull model, the findings can be interpreted as follows. The pull factors that influence the decision to return can be differentiated as:

- family factors,
- social networks in general, and
- nostalgia or "homesickness."

These factors can be summarized as elements of local bonds. In contrast, the push factors are much less specific, but they often support the decision to return. That means that return migration may also indicate that someone has not been integrated at the place where he lived previously, or that his professional prospects have

deteriorated. Even though private motives are usually crucial for the return migration processes, the realisation of the wish to return is still influenced by job prospects. Results from other studies and from the analysis of the biographic interviews indicate that the economic reasons that cause exit migration often also tend to hinder return migration.

The synopsis of return migration typologies presented in Chapter 2.1.2 is only to a limited extent suitable for explaining return migration to East Germany. The presented typologies focus mainly on the economic preconditions of migration, whereas the empirical results indicate that social networks and emotional factors play a significant role in the return migration decision. Nevertheless, it is possible to draw some conclusions based on the existing return migration typologies. First, the percentage of the unemployed is higher among the interviewed return migrants than among the other interviewed migrants. However, the results indicate that most of the remigrants cannot be typified as "remigrants of failure," but rather as people who are able to plan their lives actively. The remigrants are committed to private as well as to social issues, and they are open-minded and willing to break new professional ground. However, some of them are also willing to accept, for example, lower salaries, worse working conditions, or less skilled positions in order to realize their desire for return migration. Some return after becoming unemployed at the preceding domicile. Speaking in Cerases terminology, these return migrants are not "innovative remigrants." Others succeed in finding adequate new employment, often with the support of social networks.

References

Agunias, D.R. (2006): From a zero-sum to a win-win scenario: literature review on circular migration. Migration Policy Institute. Washington, D.C.

Bähr, J. (2004): Bevölkerungsgeographie. 4th edition. Stuttgart: UTB.

Beck, G. (2004): Wandern gegen den Strom: West-Ost-Migration in Deutschland. In: Swiaczny, F./ Haug, S. (Hrsg.): Bevölkerungsgeographische Forschung zur Migration und Integration. Materialien zur Bevölkerungswissenschaft Heft 112, 95-111.

Blechner, G. (1998): Alterwerden in der Heimat und in Deutschland. Zurückgekehrte und hiergebliebene alte, italienische Migranten – aus drei Regionen – im Vergleich. Frankfurt/M.: Peter Lang.

Born, M./ Goltz, E./ Saupe, G. (2004): Wanderungsmotive zugewanderter älterer Menschen. In: Raumforschung und Raumordnung 2, 109-120.

Bourdieu, P. (1991): Physischer, sozialer und angeeigneter physischer Raum. In: Wentz, M.: Stadt-Räume. Die Zukunft des Städtischen. Frankfurt/M and New York: Campus, 25-34.

Brecht, B. (1995): Analyse der Rückkehr von Gastarbeitern. Akademische Abhandlungen zu den Wirtschaftswissenschaften. Berlin: Verlag für Wissenschaft und Forschung.

Buchholt, S. (1998): Gesellschaftliche Transformation, kulturelle Identität und soziale Beziehungen. Soziale Netzwerke in der Oberlausitz zwischen Modernisierung und Kontinuität. Münster: LIT.

Bürkner, H.-J./ Heller, W./ Unrau, J. (1988): Die erfolgreiche Rückkehr von Arbeitsmigranten – Mythos oder Wirklichkeit? Kritische Anmerkungen zur Verwendung von Wanderungstypologien in der geographischen Remigrationsforschung. In: Die Erde 119(1), 15-24.

Cassarino, J.-P. (2004): Theorising Return Migration: the Conceptual Approach to Return Migrants Revisited. In: International Journal on Multicultural Societies 6(2), 253-279.

Cebula, R. J. (1981): The Determinants of Human Migration. Toronto: Lexington Books.

Cerase, F. (1967): A Study of Italian Migrants returning form the U.S.A. In: International Migration Review 1, 67-74.

Desbarats, J. (1983): Constrained Choice and Migration. In: Geografiska Annaler 65 B, 11-22

Dienel, C./ Gerloff, A./ Lesske, L./ et al. (2004): Zukunftschancen junger Frauen in Sachsen-Anhalt. Zukunftschancen junger Familien in Sachsen-Anhalt. Abschlussbericht. November 2004. URL: http://www.sgw.hs-magdeburg.de/menschen/ berichte2005 /abschlussbericht.pdf (access: 2006-01-13).

Dienel, H.-L./ Reim, D./ Schmithals, J. (2007): Zu- und Rückwanderung nach Ostdeutschland – Bevölkerungsstabilisierung ostdeutscher Städte durch West-Ostwanderung. In: vhw Forum Wohneigentum 3, 156-160.

Dinkel, R. H./ Salzmann, T. (2007): die Kohortendarstellung der Migration am Beispiel Mecklenburg-Vorpommerns. In: Wirtschaft und Statistik 10, 1022-1031.

Falk, I./ Kilpatrick, S. (2000): What is social capital? A study of interaction in a rural community. In: Sociologica Ruralis 40, 87-110.

Filsinger, D. (2002): Die Entwicklung der kommunalen Integrationspolitik und Integrationspraxis der 90er Jahre. In: Migration und Soziale Arbeit 2, 13-20.

Findlay, A.M. (1988): From Settlers to Skilled Transients - The Changing Structure of British International Migration. In: Geoforum 19(4), 401-410.

Findlay, A.M./ Gould, W.T.S. (1989): Skilled International Migration - A Research Agenda. In: AREA 21(1), 3-11.

Glaser, B.G./ Strauss, A.L. (1967): The discovery of grounded theory. Strategies for qualitative research. Chicago: Aldine Publishing Company.

Glettler, M. (2001): Zur Problematik der Rückwanderung aus den USA nach Südosteuropa vor dem ersten Weltkrieg. In: P. Heumos: Heimat und Exil. Emigration und Rückwanderung, Vertreibung und Integration in der Geschichte der Tschechoslowakei. München: Oldenbourg, 85-98.

Grünheid, E. (2009): Überblick über die demografische Entwicklung in West- und Ostdeutschland von 1990 bis 2004. In: Cassens, I./ Luy, M./ Scholz, R. (ed.): Die Bevölkerung in Ost- und Westdeutschland. Heidelberg: VS-Verlag, 12-47.

Hanafi, S. (2005): Social Capital and Refugee Repatriation: A Study of Economic and Social Transnational Kinship Networks in Palestine/Israel. In: Leech, A.M./ Lipstick, I.S. (eds.): Exile and Return: Predicaments of Palestinians and Jews. Philadelphia: University of Pennsylvania Press, 57-82.

Hannken, H. (2004): Internationale Migration von und nach Afrika: der weite Weg zurück nach Eritrea. Immigration – Emigration – Remigration. Münster: LIT.

Heumos, P. (2001): Heimat und Exil. Emigration und Rückwanderung, Vertreibung und Integration in der Geschichte der Tschechoslowakei. München: Oldenbourg.

Hunger, U. (2003): Vom Brain Drain zum Brain Gain – Die Auswirkungen der Migration von Hochqualifizierten auf Abgabe- und Aufnahmeländer. Bonn: Wirtschafts- und sozialpolitisches Forschungs- und Beratungszentrums der Friedrich-Ebert-Stiftung, Abteilung Arbeit und Sozialpolitik.

Jain, A./ Schmithals, J. (2009): Motive für die Wanderung von West- nach Ostdeutschland und Rückkehrtypen. In: Cassens, I./ Luy, M./ Scholz, R. (ed.): Die Bevölkerung in Ost- und Westdeutschland. Heidelberg: VS-Verlag, 313-333.

Kaiser, F.G. (1993): Mobilität als Wohnproblem. Ortsbindung im Licht der emotionalen Regulation. Bern: Lang.

Kalter, F. (1997): Wohnortwechsel in Deutschland. Ein Beitrag zur Migrationstheorie und zur empirischen Anwendung von Rational-Choice-Modellen. Opladen: Westdeutscher Verlag.

Kaplan, D.H. (1995): Differences in Migration Determinants for Linguistic Groups in Canada. In: Prof. Geographer 47, 115-125.

Keupp, H. (1987): Soziale Netzwerke. Eine Metapher des gesellschaftlichen Umbruchs? In: Keupp, H./ Röhrle, B.: Soziale Netzwerke. Frankfurt/M. and New York: Campus, 11 53.

Keupp, H./Röhrle, B. (1987): Soziale Netzwerke. Frankfurt/M. and New York: Campus.

Langer, Y. (2004): Die Rolle von Kultur und Identität im Integrationsprozess von Zuwanderern und ihre Implikationen für die kommunale Integrationspolitik. In: Swiaczny, F/ Haug, S. (Hrsg.): Bevölkerungsgeographische Forschung zur Migration und Integration. Materialien zur Bevölkerungswissenschaft Heft 112, 53-69.

Leech, A.M./ Lipstick, I.S. (2005): Exile and Return: Predicaments of Palestinians and Jews. Philadelphia: University of Pennsylvania Press.

Lee, E. (1966): A theory of migration. In: Demography 3(1), 47-57.

Lilli, W./ Diehl, M. (1999): Regionale Identität in der Kurpfalz und in Südhessen: Untersuchungen zur Raumwahrnehmung, Raumbindung und Bewahrung regionaler Identität. In: M. Bornewasser und R. Wakenhut: Ethnisches und nationales Bewußtsein - Zwischen Globalisierung und Regionalisierung. Frankfurt/M: Peter Lang, 101-121.

Bornewasser, M./ Wakenhut, R. (1999): Ethnisches und nationales Bewußtsein - Zwischen Globalisierung und Regionalisierung. Frankfurt/M: Peter Lang.

Mai, R./ Scharein, M. (2009): Effekte der Binnenmigration auf die Bevölkerungsentwicklung und Alterung in den Bundesländern. In: Cassens, I./ Luy, M./ Scholz, R. (Hrsg.): Die Bevölkerung in Ost- und Westdeutschland. Heidelberg: VS-Verlag, 75-99.

Mai, R. (2007): Trends der Binnenwanderung in Deutschland. In: Mai, R./ Roloff, J./ Micheel, F. (Hrsg.): Regionale Alterung in Deutschland unter besonderer Berücksichtigung der Binnenwanderungen. Wiesbaden: Bundesinstitut für Bevölkerungsforschung, 219-289.

Mai, R. (2004): Altersselektivität und regionalpolitische Konsequenzen der Abwanderung aus Ostdeutschland. URL: http://www.schrumpfende-stadt.de (access: 03.05.2004).

Mai, U. (1993): Kulturschock und Identitätsverlust: Über soziale und sinnliche Enteignung von Heimat in Ostdeutschland nach der Wende. In: Geographische Rundschau 45, 232–237.

Maretzke, S. (2009): Die Bevölkerungsentwicklung in den Regionen Deutschlands - Ein Spiegelbild der vielfältigen ökonomischen und sozialen Disparitäten. In: Cassens, I./ Luy, M./ Scholz, R. (Hrsg.): Die Bevölkerung in Ost- und Westdeutschland. Heidelberg: VS-Verlag, 223-260.

Mead, G.H. (1973): Geist, Identität und Gesellschaft aus der Sicht des Sozialbehaviorismus. Frankfurt/M.: Suhrkamp.

Migremus (o. J.): Konzept zum Forschungsprogramm Migration und Stadtentwicklung. URL: http://www.migremus.uni-bremen.de/downloads/links/Forschungsprogramm.pdf (access: 12.09.2007).

Mohan, G./ Mohan, J. (2002): Placing social capital. In: Progress in Human Geography 26, 191-210.

OECD (Organisation for Economic Co-operation and Development) (2001): The well-being of nations: the role of human and social capital. Paris: OECD.

Oxfeld, E./ Long, L. (2004): Introduction: An Ethnography of Return. In: L. Long and E. Oxfeld: Coming Home? Refugees, Migrants, and Those Who Stayed Behind. Philadelphia: University of Pennsylvania Press, 1-15.

Oxfeld, E./ Long, L. (2004): Coming Home? Refugees, Migrants, and Those Who Stayed Behind. Philadelphia: University of Pennsylvania Press.

Newbold, K.B./ Bell, M. (2001): Return and Onwards Migration in Canada and Australia: Evidence from Fixed Interval Data. In: International Migration Review 35(4), 1157-1184.

Pethe, H. (2004): Die Migration von hoch qualifizierten Arbeitskräften nach Deutschland – Eine Untersuchung zur ‚Greencard'. In: Swiaczny, F./ Haug, S.: Bevölkerungsgeographische Forschung zur Migration und Integration. Materialien zur Bevölkerungswissenschaft Heft 112, 69-95.

Pohl, J. (1993): Regionalbewusstsein als Thema der Sozialgeographie. Theoretische Überlegungen und empirische Untersuchungen am Beispiel Friaul. In: Münchener Geographische Hefte 70. Kallmünz/Regensburg.

Putnam, R.D. (2000): Bowling alone: the collapse and revival of American community. New York: Simon & Schuster.

Ramos, Maria da Conceicao Pereira (2003): Accao social na àrea do emprego e da formacao profissional. Lisbon: Universidade Aberta.

Ravenstein, E.G. (1885): The Laws of Migration. In: Journal of the Royal Statistical Society 46, 167-235.

Ravenstein, E.G. (1889): The Laws of Migration: Second Paper. In: Journal of the Royal Statistical Society 52, 241-305.

Röllin P./ Preibisch, M. (1993): Vertrautes wird fremd. Fremdes vertraut. Ortsveränderung und räumliche Identität. Basel und Frankfurt/M.: Helbing & Lichtenhahn.

Salzmann, T. (2009): Die unterschiedlichen bevölkerungsdynamischen Konsequenzen von Migration, Mortalität und Fertilität. In: Cassens, I./ Luy, M./ Scholz, R. (ed.): Die Bevölkerung in Ost- und Westdeutschland. Heidelberg: VS-Verlag, 48-74.

Schaffer, F./ Poschwatta, W. (1986): Angewandte Sozialgeographie. Karl Ruppert zum 60. Geburtstag. Angewandte Sozialgeographie-Beiträge 12. Augsburg: Renate Moosreiner Verlag.

Schmied, W. (1985): Ortsverbundenheit und Lebensqualität. Schriftenreihe der Forschungs-gesellschaft für. Agrarpolitik und Agrarsoziologie. Bonn: Universität Bonn.

Schmithals, J. (2008): Rückwanderung nach Ostdeutschland. In: Hillmann, F./ Windzio, M. (ed.): Migration und städtischer Raum. Opladen, 137-156.

Schrettenbrunner, H. (1986): Die Verwendung von Typologien in der Wanderungsforschung. In: Schaffer, F./ Poschwatta, W.: Angewandte Sozialgeographie. Karl Ruppert zum 60. Geburtstag. Angewandte Sozialgeographie-Beiträge 12. Augsburg: Renate Moosreiner Verlag, 387-404.

Schneider, N./ Spellerberg, A. (1999): Lebensstile, Wohnbedürfnisse und räumliche Mobilität. Opladen: Leske & Budrich.

Shumway, J.M./ Hall, G. (1996): Self-Selection, Earnings and Chicano Migration: Differences Between Return and Onwards Migrants. In: International Migration Review 30(4), 979-994.

Steiner, C. (2004): Bleibst Du noch oder gehst Du schon? In: Berliner Debatte Initial 15(4), 42-55.

Steinführer, A. (2004): Wohnstandortentscheidungen und städtische Transformation. Wiesbaden: VS.

Strauss, A.L./ Corbin, J. (1996): Grundlagen Qualitativer Sozialforschung. Weinheim: Beltz Psychologie Verlags Union.

Swiaczny, F./ Haug, S. (2004): Bevölkerungsgeographische Forschung zur Migration und Integration. Materialien zur Bevölkerungswissenschaft. Heft 112. Wiesbaden: Bundesinstitut für Bevölkerungsforschung (BiB).

Treibel, A.(1999): Migration in modernen Gesellschaften. Soziale Folgen von Einwanderung, Gastarbeit und Flucht. Weinheim/München: Juventa.

Unger, L. (1986): Die Rückkehr der zweiten Generation. Eine empirische Untersuchung zur Remigration griechischer Jugendlicher. Bielefelder Studien zur Entwicklungssoziologie. Vol. 33. Saarbrücken: Verlag für Entwicklungspolitik.

von Reichert, C. (2002): Returning and New Montana Migrants: Socio-economic and Motivational Differences. In: Growth and Change 33, 133-151.

Wagner, M. (1989): Räumliche Mobilität im Lebensverlauf. Eine empirische Untersuchung sozialer Bedingungen der Migration. Stuttgart: Enke.

Weichhart, P. (1993): Mikroanalytische Ansätze der Sozialgeographie. In: Innsbrucker Geographische Studien 20, 101-115.

Wentz, M. (1991): Stadt-Räume. Die Zukunft des Städtischen Band 2. Frankfurt/M., New York: Campus.

Werlen, B. (1995): Landschaft, Raum und Gesellschaft. In: Geographische Rundschau 47, 513-522.

Witzel, A. (2000): Das problemzentrierte Interview. Forum Qualitative Sozialforschung, Volume 1, No. 1, URL: http://www.qualitative-research.net/fqs-texte/1-00/1-00witzel-d.htm. (access: 13.02.2006).

Woolcock, M. (1998): Social capital and economic development: toward a theoretical synthesis and policy framework. In: Theory and Society 27, 151-208.

The Influence of Regional Factors on Individual Mobility Patterns
Considering East-West Migration in Germany

Silvia Maja Melzer

1. Introduction

After the collapse of the Eastern Bloc, the former German Democratic Republic (GDR) found itself in a unique position (Mayer, 2006: 2). The reconstruction of East Germany was overseen by the government of the Federal Republic of Germany (FRG), whose main intention was to unify the two sovereign states of East and West Germany (Goedicke, 2006).

At that time – and, of course, prior to this period of reconstruction – the economic situation in the East differed greatly from that in the West. The socialist system was never able to compete with its capitalist counterpart, and the Eastern economy lagged far behind Western standards. Living conditions differed, not just between East and West Germany, but also to a lesser extent within both parts, largely due to regional characteristics and local economic conditions (Maretzke, 2009). What may at first seem perplexing from our present-day perspective is that many of the differences in living standards between East and West have persisted to this day. Even now, nearly 20 years after reunification, the difference in wages between East and West Germany is remarkable. In 2006, gross wages for men were still 32.5 per cent lower in the East (19 per cent lower for women).[1]

During reunification, the East German economy underwent rapid changes: the entire economic system was restructured and privatised. This changing economic environment had a profound influence on people's lives. They had to adapt and reconstruct their living strategies in a changing social and political environment, while facing considerable economic pressure (Mayer, 2006: 16). High and persistent movement from East to West Germany, which has dominated regional mobility patterns ever since, was the consequence. Compared to the population level in 1988[2], the former GDR had lost 7.9 per cent of its population by the year 1995,

---

[1] Own calculations on the basis of the *IAB Beschäftigten-Historik* (BeH) V7.01, Nuremberg 2007.

[2] For population levels of the GDR, see *Statistisches Jahrbuch der DDR* (1989): 335. For more recent figures, see the Federal Statistical Office Wiesbaden (2006). The figures presented are without East

10.7 per cent by 2000, and 14.1 per cent by 2006[3]. The purpose of this study is to examine this phenomenon as a possible reaction to the labour market situation: migration from East to West Germany.

Numerous studies have addressed East-West migration using individual and aggregate data. The influence of individual characteristics on migration from East to West Germany is well-documented. In general, migrants tend to be selected by age[4] and other characteristics from the population. They have higher individual income (Brücker/Trübswetter, 2007; Hunt, 2000, 2006; Windzio, 2007) and better education (Hunt, 2006). The categories of people who are most likely to leave East Germany include the unemployed (Hunt, 2000, 2006; Schwarze/Wagner, 1992; Wagner, 1992; Windzio, 2007), people with an unemployed partner (Schwarze/ Wagner 1992; Wagner 1992), and people whose working hours have been reduced or who work reduced-hours (Hunt, 2000).

Analyses on the aggregate level provide an overview of the development of the migration (e.g., Heiland, 2004). On the macro level, migration is usually treated as one of a number of factors that have led to differences in the population structure between East and West Germany. It is in this context that the interdependency between migration, fertility and mortality is examined (e.g., Dinkel, 2004; Salzman, 2009). Various aspects are analysed, including ageing (Mai, 2009), family formation and living habits (Grünheid, 2009; Kreyenfeld, 2009), or even development of the labour force potential (Fuchs/Söhnlein, 2009).

The influence of the regional labour market characteristics on migration based on aggregate data has seldom been subjected to systematic research. Based on aggregate data, Hunt (2006) identified a negative effect of income levels in the region of origin, and a positive effect of income levels at the destination on migration. Regional unemployment rates show a negative effect on migration in both the source and the destination regions (Hunt 2000, 2006). The impact of regional determinants on individual decisions to migrate, however, remains unclear. Although institutional factors set the framework for individual action – regional unemployment rates, for example, determine the chances and risks of finding or losing a job – the link between the micro and the macro levels is missing. To explain migration patterns, it is necessary to analyse individual behaviour, which is embedded in an institutional framework. Only recently has research started to

---

Berlin, as it is not possible to differentiate between East and West Berlin after 2000. Until that year, East Germany including Berlin lost 10.1 percent of its former population.

3 However, apart from relocation to the West, other reasons, such as fertility decline (Adler, 2004; Sackmann, 2000) and migration abroad, account for some of the drop in the Eastern population (Maretzke, 2009: 254).

4 The age composition of migrants differed greatly depending on the time frame in which they left East Germany (Mai, 2003). For example, at the beginning of the reunification process, migration was common among all age groups.

analyse the impact of regional features on migration. One of the few such studies on East Germany was by Windzio (2007), who used a multilevel event history model to investigate the influence of unemployment and living distance to West Germany. He found that both regional unemployment rates in the Eastern regions and the distance to West Germany have negative effects on individual migration decisions. However, research into the impact of further regional characteristics on migration, such as income levels and the income distribution, does not yet exist.

The aim of this article is to fill this gap, and to study the impact of regional characteristics, especially regional income levels, on the migration of individuals from East to West Germany. The theoretical framework is based on human capital theory (Becker, 1962; Sjaastad, 1962), which was extended by Borjas (1987, 1990) using the Roy Model (1951), and, subsequently, by Chriswick (1978, 1999). Based on the analytical approach of Windzio (2006, 2007)[5], various time-dependent and time-stable regional factors, such as income levels, income distributions, unemployment rates, distance to West Germany and density of population, are estimated. Multilevel regressions on three levels are used to capture the impact of regional characteristics on migration. This makes it possible to control for changes in population in a region over time, as well as for variations in population between regions. The main advantage of this model is that the impact of time-dependent labour market characteristics on individual decisions can be estimated. Usually, only time-stable variables can be included in multilevel regressions on the macro level (c.f. Windzio 2006). The German Socio-Economic Panel (SOEP) waves from 1992 to 2006 provide the data for the empirical analyses. While most previous studies consider only periods up to 2001, more recent data is also included in this analysis. Supplementary information on labour market characteristics is provided by the Federal Employment Agency[6], and information on the density of population and distance to West Germany is drawn from the Federal Urban Planning Report (*Städtebaulicher Bericht der Bundesregierung*, 2004).

2. Theory

As early as in 1962, Sjaastad proposed that migration can be defined as an investment, not unlike investment in schooling or on-the-job training, and extended the human capital theory put forward by Becker (1962) to migration. In this approach, migration arises due to local income differences, and people will leave their region of origin if the gap in real earnings between their region and another is large

---

5 The structure of the multilevel regression is similar, but no cumulative process dependence is used.
6 *IAB Beschäftigten-Historik* (BeH) V7.01, Nuremberg 2007.

enough. Thus, individuals compare their present discounted net incomes at the place of origin and the destination. The higher the personal income is at the destination, and the lower it is at the place of origin, the higher the probability of migration. If the benefits at the destination exceed the benefits and the underlying costs at the place of origin, people will migrate.[7] The core idea is that migrants have to bear costs in the present in order to gain benefits in the future. Since individual payment is highly correlated to local income levels, people respond to local income differences, and are likely to leave regions with low incomes for destinations with high income levels. Moreover, regional unemployment rates as a proxy for the individual risk of unemployment should influence the individual income calculation, as unemployment drastically reduces the financial means available to people.

It is important to remember that the income gains from migration vary among individuals. This is mainly due to the fact that individuals differ in productivity. In Becker's theory (1962), higher productivity is associated with higher human capital. However, there are different kinds of human capital. Specific knowledge includes information about the organisation in which the person works. Usually, this form of knowledge should increase with the time spent in a company. It usually cannot be transferred, and loses its value after a job change. In contrast, general education is independent of institutional constraints, ubiquitously applicable and easy to implement under different circumstances. Therefore, only individuals with generally high levels of human capital should profit from migration, since they will achieve similar levels of productivity regardless their location. Those who manage to accumulate high amounts of specific knowledge should be, by contrast, be relatively immobile and only willing to migrate if other factors compensate for the loss of specific knowledge. The age of an employee is a characteristic that correlates highly with the amount of time spent at a company. Young people will have accumulated less specific knowledge than their older colleagues. Furthermore, the remaining duration of their professional lives is longer, and, as a consequence, they will profit from the investment in relocation for a longer period (Becker 1962).[8] Therefore, the lower the age, the more likely a person is to migrate to the West.

The current situation and the past employment status determine how much firm-specific human capital a person can accrue. Just as people accumulate firm-specific human capital while employed, they lose this type of capital during phases of unemployment. The productivity of unemployed individuals remains stable or even declines, which reduces their attractiveness to potential employers. Other theories posit further consequences of unemployment. For example, unemployment

---

7 There are also other forms of migration, such as involuntary migration, for which rational considerations are secondary (c.f. Kalter, 1997: 62ff).
8 Job changes can also be especially profitable at the beginning of one's professional career, as they improve person-job matching (Topel/Ward, 1992).

is said to send out negative signals, as it might indicate negative personal characteristics the employer cannot control (Vishwanath, 1989). The devaluation of human capital, as well as this negative signalling, should increase in importance as the amount of time spent unemployed grows. As a result, individuals are likely to leave regions with high unemployment and low income levels.

To address the selectivity of migrants, Borjas (1987, 1990) and Chiswick (1978, 1999) extend the simple human capital approach by taking the income distribution at the origin and destination into account. The core of those models is the ratio of individual wages at the destination and at the place of origin, which provides varying incentives for individuals with different educational backgrounds. People whose wages are at the lower end of the income distribution – usually those with limited higher education – prefer regions with a compressed income structure. The penalty for the relative lack of education is lower in such regions, in which the living standards of the rich and the poor are more similar. By contrast, individuals who are highly educated are better off in regions with high income inequality, since the marginal value of their education is higher there. Not only do incomes differ between the East and the West; the distribution of income differs as well. Income levels in East Germany are still influenced by the country's socialist past, and are therefore more balanced (Pollack, 1990; see also Statistisches Bundesamt, 2004: 625ff). In the framework of the extended human capital approach, people do not necessarily leave regions with low incomes, but regions with an unfavourable income distribution for them personally. To sum up, people with high levels of general education have several incentives for migration. First, general education is universally applicable. Second, if the monetary costs are fixed, the share of these costs declines with the income level. More highly educated people therefore have lower relative costs. Third, they usually have broader personal networks, and therefore lower non-monetary costs of relocation. Finally, due to the broader income distribution in the West, they have higher selective incentives in the form of higher income gains (c.f. Chriswick, 1978, 1999; Borjas, 1987, 1990)

3. Data and Methods

3.1 Data

The 1992 to 2006 waves of the German Socio-Economic Panel (SOEP) are used for the study. The SOEP is a representative longitudinal survey of private households started in 1984 for West Germany and West Berlin. In 1990, the sample was extended to the former GDR. This population was over-sampled to allow for a separate analysis of East Germany (Haisken-DeNew/Frick, 2005). In 1998, the panel was refreshed and new respondents were added. Growing up in a SOEP

household also brings additional respondents into the sample, as every household member older than 16 completes his or her own questionnaire. Finally, people who move into an existing panel household are also included in the panel.

The SOEP data combines 500 cases of migration and around 3,500 cases per wave with extensive information on individuals, as well as on their spouses and children. The questions address topics ranging from employment and income to education and marital status. A regional specification is available, making it possible to identify not only the former East or West Germany, but also the exact district town (NUTS 3 level). Additional information makes it possible to identify East-West or weekly commuters. Since these individuals may be more similar to migrants than to stayers, all individuals who can be identified as commuters are excluded from the sample. The number of commuters per year varies between 73 East-West and 48 weekly commuters in 1992, and 151 East-West and 81 weekly commuters in 2003. Also excluded are individuals with missing information on the place of residency. At the same time, people with missing values for the independent variables are kept in the sample, while the missing values are estimated by single imputation.

The SOEP dataset contains over 220,705 cases from the years between 1992 and 2006. Since I am only interested in migration from East to West, the study is restricted to East Germany and contains 55,599 cases. After repeated East-West migrants, commuters and all persons older than 64 or younger than 16 are excluded; 53,764 cases (26,053 men and 27,711 women) in 15 waves are left.

Participation in the waves ranges from 3,130 respondents in 1997 to 4,795 respondents in the year 2000. The sample is unbalanced. Over the years, exactly 500 persons (222 men and 278 women) moved to West Germany. The yearly migration flows vary between 15 people in 1995 to 70 in 2001.

3.2 Variables

People are classified as migrants when they change their place of residency and move from East to West Germany, and the interviews were carried out at the new place of residence. The dependent dummy variable, "mobile," takes the value one if a person relocates from East to West Germany, and is zero otherwise. Only the first relocation from East to West Germany is considered. To ensure the comparability of migrants and stayers, all characteristics of migrants are measured in the last year spent in East Germany.

The individual's level of general education is measured directly, first in years spent in educational institutions and apprenticeships, and second in educational degrees. By contrast, firm-specific human capital is estimated by using the years of employment experience, with the duration in years of the most recent job serving as a basis. In addition, the analysed information on specific human capital includes the

duration of any period of unemployment. The next variable is the employment status. It is used because migration behaviour is likely to be influenced not only by labour market experience and past periods of unemployment, but also by current employment status. This variable distinguishes between six categories: full-time employment, part-time employment, employment on an irregular basis[9], unemployment, apprenticeship and schooling. Finally, data on marital status (married=1), as well as information on children's ages, are used as control variables (dummy variable; children younger than 19). As further demographic variables, gender (female=1) and age are included. There are six age groups, starting with ages 16-20, and adding five years to each subsequent group. The last group, however, comprises all those ages 41-64.

Since human capital theory assumes that regional differences influence migration, daily local income and regional unemployment at the NUTS 3 level, rounded to one per cent, are added to the analysis. All information on average daily incomes is taken from the data of the Federal Employment Agency.[10] Due to the large differences in the wages of men and women, gender-specific data are used. The unemployment rates from 1998 to 2006 were also taken from the official data of the Federal Employment Agency. Gender-specific unemployment rates on the NUTS 3 level are not available before 1998. However, the IABS data make it possible to approximate the gender-specific unemployment rates for the period from 1992 onwards. Information about the distance to the next West German region is also included. This distance is measured, at a 10 km scale, from the district town in the source region to the next West German district town.[11] Finally, information on the population density provided by the Federal Urban Planning Report on a three-level scale is included. This scale distinguishes between cities with high population density, towns with average population density and areas with lower population density (rural areas).

3.3 Methods

People are usually embedded in institutional frameworks, and the individual decision to migrate is influenced not only by personal characteristics, but also by the

---

9 These are people who work marginally (*geringfügig*) or sporadically.

10 *IAB Beschäftigten-Historik* (BeH) V7.01, Nuremberg 2007. In the first step, the average daily income is estimated using the information on the length of employment (in days) and the aggregated income over the entire period. Subsequently, the average daily income in a region is estimated taking into account all persons employed over the marginal threshold. The values are rounded to €1.

11 West Berlin is not taken into account as there is no differentiation between East and West Berlin on the NUT3 level available in the data.

situation on the labour market. Multilevel regressions make it possible to capture the influence of local factors on the individual decision, and therefore to analyse the micro-macro link. If units of interests are nested in units of higher levels – for example, individuals within organisations – multilevel regression techniques are used. In this case, the model relates 'person-years' to regions and to the time people spend in them. The idea behind this approach is that individuals who live in a district at a specific time are exposed to the same labour market conditions that may influence their decision to migrate. The multivariate regression model contains three levels.[12] At the macro level, the regions (NUTS 3 level), are included (see also Figure 1). The second level is defined by the number of years individuals spend within those regions. At these levels, time-varying information on the labour market is included in the analysis. At the individual level, finally, cross-sectional observations are included. The observations are not related to preceding and subsequent observations in the individual's life. The hierarchical regression is specified in the form of a logit model. It calculates the probability of migration to the West, given the characteristics controlled for. The logit model estimates the probability of migration between the groups, which are defined by the explanatory variables. Models with random effects are used, since some of the groups become very small through the decomposition on regions and years, and the design of random effects models is best able to deal with small groups.

In general, the individual level represents a cross-section of the individuals who live in a region in a particular year. On the one hand, the models reflect the change in the composition of the population over time in specific regions; and, on the other, they control for the variation in the population across the spatial groups.

The main advantage of the model is that the impact of time-dependent labour market characteristics on each individual migration is estimated (c.f. Windzio 2006). This is important in the case of East Germany, as rapid economic changes took place during the reunification process which may have influenced individual decisions to migrate. This changing economic environment profoundly influenced East Germans' lives and prospects for the future. The estimation using multilevel regression accounts for the changes that occurred within the regions, and for the differences between them, capturing the influence they have on the individual decision to migrate.

---

12   The concept is based on Windzio's (2006) models. However, he estimates multilevel event history models using the time spent in the labour market.
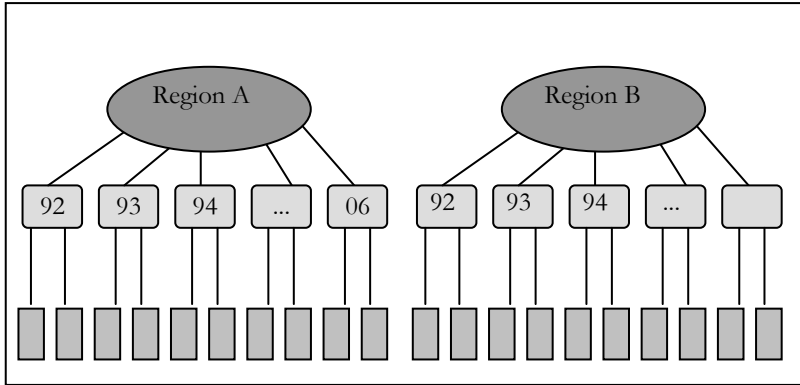
Source: Figure based on Windzio (2006): 6.

4. Results

4.1 Descriptive Analysis

The following table presents the means of selected factors which, according to human capital theory, influence migration (Table 1 for men and Table 2 for women). Since large differences in the migrants' age structures are expected, in addition to providing a descriptive evaluation of the whole sample, we also analyse the sample separately for those younger and older than 30 years of age. All descriptions are carried out on the basis of weighted data. The weights generalise the data on the individuals surveyed to the entire population of East Germany on a yearly basis from 1992 to 2006. However, results of the multilevel analysis presented in Subsection 5.2 are estimated without weighting.

4.1.1 Wages

As pointed out previously, the income gap between East and West Germany stimulates migration, as it provides incentives to move in order to achieve financial gains. In addition, individual wages are strongly connected to individual productivity, and therefore to general and specific levels education. Male migrants (m) earn on average €1,341 per month, while stayers (s) earn €148 less. These wage differences are only significant at the 10 per cent level for the joint sample (see diff. m/s). For men, the significance levels are given in columns four, seven, and 10, depending on the

group analysed. For women, this information is given in columns five, nine, and 13 of Table 2. For the separated samples, the levels of significance are higher. The separate analysis reduces the variance in wages, which otherwise would be enormous because of the wage gap between younger and older workers. Compared to the whole sample, average earnings are considerably lower if only individuals under 30 are examined. Migrating men from the younger group earn an average of €847, while those who are immobile only earn €692 per month. Note that incomes in this group are generally low, as they include trainees as well as secondary school students. In the older group, wages are not only higher, but the gap between mobile and the immobile individuals is wider. Migrants over 30 earn approximately €565 more than individuals who remain in East Germany. It is important to note, however, that wages varied between movers and stayers even before relocation took place, which can be interpreted as a first hint of selection effects. The analysis refers to the most recent year spent in the East, and therefore to the last yearly wage earned. The differences cannot be traced back to the income gap between the two parts of Germany, but have to be attributed to the unobserved characteristics of migrants. The first hint that positive unobserved characteristics could play a role is already seen here; however, only the results of the hierarchic regressions can provide us with certainty. In fact, SOEP data shows that migrants spend longer periods of time in educational institutions and work longer hours. It is noteworthy that they tend to spend shorter periods of time at specific companies. This negates the advantages of seniority, as productivity should increase with the length of time at a company. However, for migrants, other factors must outweigh the lack of seniority. There are hardly any differences regarding employment status for men; only those in apprenticeships are more mobile than those who are full-time employees (see joint sample).

The difference between women's earnings in East and West Germany is smaller. Among men employed full-time in 2005, average monthly pre-tax earnings amounted to €3,379 in the West and €2,389 in the East. The difference was €1,218, or 29 per cent. Among women in 2005, the average monthly pre-tax income in the West was €2,565, while in the East it was €572 less, or 78 per cent of Western earnings. We can see that women earn less in both parts of Germany; and that the income gap is smaller among women than among men.

Table 1: Individual and regional characteristics of male migrants and stayers

MALE	ALL Migrant (m)[1]	ALL Stayer (s)[2]	ALL diff. (m/s)[3]	<30 Migrant (m)	<30 Stayer (s)	<30 diff. m/s	>=30 Migrant (m)	>=30 Stayer (s)	>=30 diff. (m/s)
education (y)	11.99	11.96		11.32	10.25	***	12.77	12.49	
employment									
full-time	59.31	62.37		43.00	40.05		78.14	69.22	*
part-time	0.71	1.42		0.38	1.42		1.08	1.42	-
apprenticeship	10.09	5.03	***	17.65	19.70		-	-	-
irregular employed	1.67	1.41		1.97	2.45		1.32	1.09	
not employed	26.38	27.70		33.55	27.57	*	18.09	27.75	*
in education	1.85	2.07	°	3.44	8.82		-	-	
income in €	1341.35	1193.04		847.20	691.77	*	1912.38	1346.89	***
labour force ex.									
employment (y)	2.97	5.69	***	1.18	1.63	*	5.05	6.94	*
unemployment (y)	0.53	0.66		0.41	0.33		0.67	0.77	
hours per week	32.91	31.56		27.71	26.93		38.93	32.98	**
regional char.									
urban areas	42.81	29.54	***	35.78	31.60		50.92	28.91	***
agglomerated a.	18.32	23.86	*	21.07	22.56		15.14	24.25	*
rural areas	34.82	45.92	***	39.29	44.94		29.65	46.22	***
income level (€)	56.52	53.39	***	55.66	53.55	***	57.53	53.33	***
unemployment	13.44	11.87	***	14.37	12.41	**	14.17	11.88	*
n	222	25831		121	6561		101	19270	

[1] migrants; [2] stayers; [3] difference between migrants and stayers; SOEP data 1992-2006; t-test; dependent variable migration; *** sign. P<=0,001; ** sign. P<=0,01; * sign. P<=0,05; ° sign. P<=0,1; (y) duration in years.

313

Table 2:   Individual and regional characteristics of female migrants and stayers

FEMALE	All				<30				>=30			
	Mig. (m)¹	diff. (♂/♀)²	Stayer (s)³	diff. (m/s)⁴	Mig. (m)	diff. ♂/♀	Stayer (s)	diff. m/s	Mig. (m)	diff. ♂/♀	Stayer (s)	diff. m/s
education (y)	11.84		11.79	**	11.25		10.49	**	12.88		12.20	**
employment												
full-time	33.43	***	41.37	***	25.80	**	30.65	***	46.84	***	44.72	
part-time	0.71	***	1.42	*	4.43	*	6.61	***	12.25	***	13.84	
apprenticeship	10.09	*	5.03	***	27.27	*	12.41	***	-		-	
irregular em-	1.67	*	1.41	**	8.38	*	2.62	***	1.33	***	1.62	
not employed	33.02	*	38.94	*	29.49		38.03	**	18.09	***	27.75	
in education	2.95		2.31		4.62	***	9.67	*	-	**	-	
income in €	716.4	***	832.9		578.0	***	499.0	*	958.8	**	937.3	
labour force												
employm. (y)	2.23	°	4.90	***	1.34		1.44		3.79		5.99	**
unemploym.(y)	0.61		0.91	**	0.23	°	0.37	*	0.67		0.77	°
hours per week	23.96	***	22.90		24.31		20.20	**	23.34	***	23.75	
regional char.												
urban areas	42.32		30.19	***	42.25		32.61	**	42.44		29.44	**
agglomerated a.	14.73		23.96	***	12.80		22.22	**	18.12		24.51	
rural areas	41.12		45.07		44.03	°	44.15		36.00		45.35	°
income level (€)	47.89	-	45.61	***	48.34	-	45.68	***	47.12	-	45.59	**
unemployment	14.37	-	12.41	**	14.17	-	11.88	*	13.03	-	11.84	**
n	278		27433		179		6766		99		20667	

1 migrants; 2 stayers; 3 difference between migranting men and women; 4 difference between migrants and stayers; SOEP data 1992-2006; t-test; dependent variable migration; *** sign. P<=0,001; ** sign. P<=0,01; * sign. P<=0,05; ° sign. P<=0,1; (y) duration in years.

Examining the wage differentials between female migrants and stayers produces mixed results. Analysing the whole sample, we find that women who migrate earn about €117 less than those who remain in East Germany. The difference is admittedly not statistically significant. Conversely, taking only the youngest group into account, we find that migrants earn €79 more. Finally, there is hardly any difference in the earnings of women over age 30. It seems contradictory that, based on the whole sample, migrants earn less, while they earn more in both of the divided samples. However, this effect can be explained with the different age structures of migrants and stayers. While the stayers are distributed similarly across all age groups, nearly two-thirds of migrants are younger than age 30. Therefore, the earnings in the joint sample are based on different age structures in the groups of migrants and stayers. The disproportionate number of young women among migrants should explain why migrants earn less if the whole sample is taken as the basis of analysis. Like men, women who migrate possess less work experience, have higher levels of education and work longer hours. Unlike their male counterparts, female migrants and female stayers show major differences in employment status. Based on the joint sample, we can see that migrating women are less often employed full-time or part-time, and are more often in apprenticeships or employed on an irregular basis. Finally, they are less likely to be unemployed.

4.1.2 Regional Characteristics

Finally, we analyse whether migrants are more likely to leave disadvantaged regions. According to the simple human capital theory, they should leave regions with low levels of income and high levels of unemployment. Both men and women more frequently leave regions with high local rates of unemployment, but they also leave regions with a higher local daily average income. The differences in regional income and unemployment levels are highly significant for nearly all groups. Migrants leave East German regions with (on average) two per cent higher unemployment rates, but such regions also offer higher incomes. The average unemployment rate is higher for women, which corresponds to the inferior situation of women in East Germany. Compared to the first figure, the unemployment rates in these areas should be even higher. It is impossible to compare the differences in the local situation for female and male migrants, since the correlations are between state- and gender-specific levels of income and unemployment. Therefore, no differences are included in Table 2.

Regarding population density, the analysis shows another surprising result. Migrants are more likely to come from regions with high population densities, and less frequently from rural areas. The differences are greatest between the groups of men and women older than age 30. Other than the unemployment rates and the

local income levels, the population density of a region hardly influences the mobility of younger people. It would appear that people over age 30 who live in rural areas are highly attached to their regions and are not willing to leave, even if economic conditions are less advantageous there. The descriptive evidence provides indications that regional factors do in fact influence the individual migration decision. Therefore, is it necessary to control for the regional characteristics in the regressions, as the results could be biased if the regional factors are left unconsidered.

4.2 Analytical Results

Table 3 presents the results of the multilevel regression that display the likelihood of migration to West Germany. All displayed models are structured over three levels, even if variables on the macro level are only included in Models 3 to 5. As logit models estimate the impact of migration based on maximisation of likelihood, no details on the variance of the lowest level are provided. Correspondingly, no estimations of the R² are given. However, based on the variance in the grand mean and the model of interest, we can estimate the reduction of variance of the higher levels (see Snijders/ Bosker, 1999: 100).[14] This is reasonable overall for Models 3 to 5, where variables at the higher levels were added to the analysis. In Model 3, the variance is reduced by 4.2 per cent, and, after adding the variable measuring the regional income variance in Model 4, the unexplained variance in Model 4 is reduced by 5.6 per cent. The second dimension referring to the quality of the model is the log likelihood test. As all further models are derived from the grand mean model, it usually serves as the basis of the test.[15] Additionally, the improvement over the preceding models can also be measured. We can see in Table 3 that all models represent improvements over the previous models.

According to human capital theory, varying levels of personal mobility can be explained by differences in general education and specific knowledge. To capture the large degree of influence of general and specific human capital on migration in the first model, only varying measurements of human capital, age and sex were included. More individual and regional characteristics are added step by step to display their influence on migration, and to specify the connection between education and migration.

With every additional year spent in education, the likelihood of migration rises. This can be examined for all models, regardless of the factors controlled for. The

---

14   The variance of the second and third levels of the grand mean model is divided by the variance of the second and third levels of the corresponding model. Then the value is substituted from one: 1-(var_region +var_year)/(var_region+var_year).

15   Teststatistic = (2ln(L2)-2ln(L1); degrees of freedom (m2-m1).

effect of special human capital on migration is significant and shows a negative correlation (see Model 5). One more year of education has more than twice the effect of one more year at a company. The influence of general education on migration therefore seems to be more important. The duration of the most recent period of unemployment, does not, in turn, show a significant effect in either of the models.

As predicted, age has a negative effect. The older a person is, the lower the probability of migration to West Germany. Consequently, the negative effect is highest for those in the oldest age group. If more variables are added, the significance levels of the variables measuring age decline, and some effects even become insignificant. This is an indication of the influence of other variables that are correlated with both migration and age. If the other variables are not included in the model, age captures not just its own effect on migration, but also to some extent the influence of other variables, and the significance or level of the effects is biased (c.f. Wooldrige, 2006). But it is not just age that seems to correlate with other variables; a person's sex does as well. In the first model, only a weak insignificant gender effect can be found. After additional variables on the individual level, such as employment or marital status, are included, the effect becomes significant, with women becoming 36 per cent more likely to migrate to West Germany. Note that, after regional characteristics in Models 3 and 4 are added, and even after interaction terms are included in Model 5, the effect of being female becomes even stronger, and is highly significant. If we control for their characteristics, we find that women are more mobile than men. Women also appear to be more influenced by regional features in the East. This finding is in line with the results of Mertens and Haas (2006), as well as those of Maretzke (2009), who pointed out that women react more noticeably to regional disparities.

We can see that, the higher the income, the more likely a person is to leave East Germany, even after controlling for higher education and other personal and local characteristics. With each additional €100 of income, the likelihood of migration rises by 30 per cent (Model 5). This connection is already observable in the descriptive data, which shows that migrants earn considerably higher wages. Because of the large income differences between men and women, and the smaller gap among women between Eastern and Western wages, an interaction term is included in the analysis. The term 'income*female' captures the varying influence on migration for women. The factor shows a significant and negative impact on the migration decision. This means that female migration is less influenced by individual income, and more by other reasons. First, partner search and family formation could be more important for female migration decisions (Dienel/Gerloff, 2003: 59). Second, people who migrate with partners not only take their individual income gains into account; their decision to migrate is based on benefits to the entire household (c.f. Mincer, 1978). Income gains to one partner can compensate for income losses to

the other. Migration takes place if the net effect is positive and the household gains overall from the move. This is regardless of the gains and losses of the individual household members. The partner who is more likely to lose ground because of migration is the woman (Bielby/Bielby, 1992; Smiths, 2001; Nivalainen, 2004). Women also reduce their working hours after migrating from East to West Germany (Zaiceva, 2007), which further suggests that they tend to be the tied movers. Compared to full-time workers, unemployed individuals and secondary students are more mobile. Those are the strongest effects which can be found in the entire model. The higher likelihood to migrate of students is especially remarkable since they are usually young, and are therefore already more likely to migrate than older individuals. However, the employment effect diminishes when regional variables are included. The decline of this effect is especially strong for students, losing one-third of its power (Models 3 and 4). The reason is less clear and difficult to capture, but it is obvious that, when local particularities are not included, the effect of employment status is overestimated. The greater propensity of women to migrate is, in turn, underestimated. Because of the wide differences between men and women, as seen in Table 2, in the frequency of migration during an apprenticeship, a second interaction term was included. The term 'apprenticeship *female' captures the varying levels of willingness to migrate among women in an apprenticeship. Female apprentices are three times more likely to relocate to the West than male apprentices.

The main focus of this work has been on the influence of regional characteristics on migration. In Models 3 to 5, the regional features are captured. Local income levels have the strongest effect on migration. With each additional euro, the average daily income level increases the likelihood of migration by 10 per cent. However, according to human capital theory, the predicted influence of income level on migration should be negative. As the income gap between regions is the primary mechanism that should create incentives to migrate, the negative effect is surprising. Nevertheless, there are various possible explanations for this effect. First, more productive or better-educated workers could be selecting regions with better pay in the East. Second, modern productive industries that can afford to pay higher wages are not distributed at random across the country, but are usually locally clustered. People with modern occupations who are employed by more modern companies have better chances of finding jobs in West Germany.

Table 3: Multilevel logit regression on the migration from East to West Germany for men and women

FIRST PART	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5
individual characteristics 1st level					
sex (female =1)	0.1654	0.3594**	0.9384***	0.9731***	1.3701***
reference group age16-20					
age 21-25	0.0864	0.3201	0.3243	0.3193	0.2550
age 26-30	-0.3935**	-0.1915	-0.1829	-0.1818	-0.2514
age 31-35	-0.6288***	-0.4708**	-0.4684**	-0.4672*	-0.5317**
age 36-40	-0.7677***	-0.6746***	-0.6747***	-0.6744***	-0.6998***
age 41-64	-0.8593***	-0.8382***	-0.8370***	-0.8371***	-0.8659***
education in years (y)	0.0833***	0.0855***	0.0788***	0.0778***	0.0841***
employment in the last company (y)	-0.0308**	-0.0465***	-0.0476***	-0.0477***	-0.0423***
last unemployment (y)	-0.0018	0.0387	0.0270	0.0273	0.0483
income per €100		0.2801***	0.2461**	0.2475**	0.3045***
reference group employed at full time					
part time		-0.3990*	-0.4214*	-0.4263*	-0.3038
apprenticeship		0.3853	0.3288	0.3254	-0.4031°
irregular employed		0.6111°	0.4491	0.4423	0.6422°
not employed		2.8442**	2.1466*	2.1718*	2.3465*
in education		5.7468***	3.9499**	3.8503**	4.4120**
children under age 19		-0.3378***	-0.3129**	-0.3129**	-0.3166**
married		-0.3694**	-0.3917***	-0.3913***	-0.4023***
interactions terms					
apprenticeship *female					2.9105***
income*female					-0.0709*
regional characteristics 2nd level					
Income level per €1			0.0972**	0.1124**	0.1016**
unemployment rates			0.0127°	0.0046	0.0023
income variance/100				-0.0279	-0.0333
regional characteristics 3rd level					
urban areas			-0.0660	-0.0690	-0.0826
distance per 100 km			0.1861*	0.1973*	0.1960*

Table 3:   continued

SECOND PART	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5
constant	-5.47***	-7.20***	-16.76***	-16.96***	-16.72***
σ^2 variance 3rd level	0.0081	0.0062	0.0000	0.0000	0.0000
σ^2 variance 2nd level	1.9496	1.9398	1.8686	1.8452	1.9667
log likelihood	-2573.13	-2545.64	-2532.64	-2531.43	-2392.93
n regions	113	113	113	113	113
n years	1637	1637	1637	1637	1637
n person years	53764	53764	53764	53764	53764
n migrations	500	500	500	500	500

SOEP data 1992-2006; *** sign. P<=0,001; ** sign. P<=0,01; * sign. P<=0,05; ° sign. P<=0,1: (y) duration in years: grand mean; constant -5.562343; σ^2 variance 3rd level 0.0206776; σ^2 variance 2nd level 1.926382; log likelihood -2749.4528.

As the next indicator of the labour market characteristics, local unemployment shows the predicted correlation. The higher the regional unemployment rates, the higher the probability of migration. However, the effect becomes insignificant when the income variance is included in Models 4 and 5. The positive influence of unemployment rates on individual migration decisions probably reflects the more intense competition for available jobs in regions with higher levels of unemployment. The likelihood of finding employment should be lower in such regions, and the need to migrate for the sake of a person's career may be greater. Additionally, the risk of becoming unemployed should also be greater in those regions. Therefore, some individuals might leave these areas to prevent future phases of unemployment. The income variance included in Models 4 and 5 shows the expected negative effect, but is not significant.

Two further regional time-constant variables are included in the analysis. As the variables are time-invariant, they were included in the hierarchic regression at the third, regional level. The effect of the density of population on migration contradicts the descriptive results from Section 4.1.2, and shows no significant impact on individual migration. The effect observable in the descriptive analysis is probably a data artefact. It is probably not the density of the population that has an impact on migration, but the region on its own. The hierarchical regression models control for such differences between regions, as well as for the variation over time in one region, and reject the descriptive results. Finally, the distance to the former West German border was integrated into the multilevel regression. As we can see, with every additional 100 km of distance, the likelihood of migration increases 20 per cent.

5. Conclusion

The main purpose of the analysis was to investigate the influence of regional factors on the migration of individuals from East to West Germany. Human capital theory was used as an analytical framework. The core assumption of this theoretical approach is that regional income differences constitute incentives to migrate, as incomes define living standards. This work highlights a new aspect of this debate by analysing the influence of regional income levels on migration. However, the decision to migrate is also determined by individual characteristics. Hypotheses regarding the influence of individual and regional characteristics on migration were derived from human capital theory.

To capture the impact of regional characteristics on migration, hierarchical regression models on three levels were used. The models control for changes in the population of a specific region over time, while also capturing variations in populations across the regions. Individual observations were nested according to the regions and years within the region. This mechanism allows us to control for the labour market conditions a person is exposed to. The influence of the regional characteristics on migration is measured directly. This approach differs from earlier studies, which usually use only individual characteristics to analyse migration.

While factors at the individual level have the greatest impact on migration, regional characteristics were also found to have a powerful effect. Regional unemployment rates were shown to have a positive influence on migration, yet lower local income levels appear to have a negative influence. Thus we can assume that people tend to leave regions with high unemployment, as well as areas with a higher local average income. One possible explanation for this finding is that people with higher levels of general education already work in East German regions where average pay levels are higher. Conversely, it could be the case that people from regions with modern, better-paying industries tend to migrate more frequently because they find jobs in West Germany more easily. As the effect of income does not support simple human capital theory, an additional variable was included. The variable capturing the variance of the income distribution showed a negative effect, which would be expected on the basis of the extended human capital approach. However, the effect was not significant, and did not change the impact of regional income. Additionally, the analysis showed that, the greater the distance between the region of origin and West Germany, the higher the probability of migration. The density of the population, in turn, was found to have no significant impact on migration.

According to the human capital approach as outlined by Becker (1962) and Sjaastad (1962), migrants are not only younger than stayers, they are also better-educated. Both types of human capital – general education and specific knowledge – show the expected influence on migration. General education, operationalised as years spend in education, was already demonstrated in the descriptive results to be

higher among migrants. Due to the hierarchical regression, the likelihood of migration rises by approximately 8.4 per cent with every year of education. Specific human capital, operationalised as the time spent with the most recent employer, shows a negative impact on migration. With every additional year spent in a company, the likelihood of migration to West Germany declines by 4.2 per cent. Migrants seem to be less attached to the labour market than stayers. Unemployed individuals, as well as secondary students, are more likely to migrate to West Germany than people who are employed full-time. Moreover, female trainees are three times more likely to migrate than male trainees. The duration of a period of unemployment shows no impact on migration. The positive effect of income undercuts support for the simple human capital model, since the expected direction of the effect would be negative. Within the framework of the extended human capital model, this effect can be considered to be a positive selection. After looking at regional characteristics, we found that, as anticipated, individuals leave regions with high unemployment rates; and that, unexpectedly, they also leave regions with higher average income levels.

Within the framework of the human capital approach of Borjas (1987, 1990) and Chiswick (1978, 1999), a positive selection on education and income could be found. As predicted by this model, results of the analysis confirmed the assumption that younger people with higher levels of education leave East Germany. They profit more from the higher marginal value of their education in West Germany. However, the fact that the distribution of income in a region shows no effect and also has no influence on income casts some doubt on the extended human capital approach.

The application of the hierarchical multilevel regression and the combined investigation of regional income and unemployment levels provided new results. This simultaneous analysis of income and unemployment levels was especially important as both factors are strongly connected, and the increase in income levels usually leads automatically to an increase in unemployment. While Hunt (2000, 2006) and Windzio (2007) found that regional income levels have a negative impact, this analysis showed that unemployment rates have a positive effect. Moreover, regional income levels were also found to have a positive impact on migration, which deviates from Hunt's (2000; 2006) results. However, like Hunt (2000, 2006), this study found that regional income levels influence migration to a higher degree than regional unemployment. Finally, the estimated effects of distance deviate from other results reported by Windzio (2007): in our analysis, distance was shown to have a positive effect. People from regions close to the former East-West German border are probably more likely to commute to a workplace in West Germany while still living in the East. With increasing distance, the time and money needed to commute rise, and a permanent solution becomes more attractive. Lower unemployment rates

in the Eastern districts near the former West German border (c.f. Jenke/Lebok, 2009: 346) could indicate that commuters live in those regions.

Alongside the new results on the macro level, the results of the individual levels are mostly in line with the existing literature. The positive impact of general education on migration, as well as the negative impact of the length of time spent in a company, are common findings in the migration literature. Additionally, the finding of a positive effect on income – while it contradicts human capital theory – is confirmed by other studies on East-West migration (Hunt, 2006; Brücker/ Trübswetter, 2007; Windzio, 2007). This effect can be explained by the positive selection of migrants (cf. Brücker/Trübswetter, 2007). They seem to have high general levels of education, while lacking firm-specific knowledge. With multilevel analyses, Füller (2008) showed for the United States that people who are already employed in good jobs are less likely to migrate, while migrants are usually less attached to the labour market.

In future research, the finding that women are more likely to migrate, as shown in the multilevel regressions, deserves further attention, as it contradicts the widely held assumption that women tend to be 'tied movers.' Further work should seek to explain the gender-specific differences more precisely, as well as the reasons why they appear. Subsequent analyses should take into account the influence of gender-specific individual, as well as labour market characteristics of migration. Moreover, a much broader research framework is needed, as family formation and partner search patterns for single women, as well as the influence of spouses on married women and their migration patterns, should also be considered.

References

Adler, M.A. (2004): Child-free and unmarried: changes in the life planning of young East German women. In: Journal of Marriage and the Family 66, 1170-1179.

Becker, G.S. (1962): Investment in Human Capital: A Theoretical Analysis. In: The Journal of Political Economy 70(5), 9-49.

Bielby, W.T./ Bielby, D.D. (1992): I Will Follow Him: Family Ties, Gender-Role Beliefs, and Reluctance to Relocate for a Better Job. In: American Journal of Sociology 97, 1241-1267.

Borjas, G.J. (1987): Self-Selection and the Earnings of Immigrants. In: The American Economic Review 77(4), 531-553.

Borjas, G.J. (1990): Self -Selection and the Earnings of Immigrants: Replay. In: The American Economic Review 80(1), 305-308.

Brücker, H./ Trübswetter, P. (2007): Do the Best Go West? An Analysis of the Self-Selection of Employed East-West Migrants in Germany. In: Empirica 34, 371-395.

Chriswick, B.R. (1978): The Effect of Americanization on the Earnings of Foreign-born Men. In: Journal of Political Economy 86(5), 897-921.

Chriswick, B.R. (1999): Immigration Policy and Immigrant Quality. Are Immigrants Favorably Self-Selected? In: American Economic Association 89(2), 181-185.

Dienel, C./ Gerloff, A. (2003): Geschlechtsspezifische Besonderheiten der innerdeutschen Migraion für Sachsen-Anhalt. In: Gender-Report Sachsen-Anhalt, Magdeburg Gender-Institut, 47-64.

Dinkel, R.H. (2004): Die Auswirkungen der Migration auf die Bevölkerungsentwicklung Mecklenburg-Vorpommerns. In: Werz, N./ Nuthmann, R. (Hrsg.): Abwanderung und Migration in Mecklenburg und Vorpommern. Wiesbaden, VS-Verlag, 183-201.

Fuchs, J./ Söhnlein, D. (2009): Der Einfluss der Bevölkerungsentwicklung auf das künftige Erwerbspotenzial in Ost- und Westdeutschland. In: Cassens, I./ Luy, M./ Scholz, R. (Hrsg.): Die Bevölkerung in Ost- und Westdeutschland. Demographische, gesellschaftliche und wirtschaftliche Entwicklungen seit der Wende. Wiesbaden VS Research, 200-222.

Fuller, S. (2008): Job Mobility and Wage Trajectories for Men and Women in the United States. In: American Sociological Review 73, 158-183.

Goedicke, A. (2006): A Ready-Made State: The Mode of Institutional Transition in East Germany After 1989. In: Diewald, M./ Goedicke, A./ Mayer, K.U. (Hrsg.) After the Fall of the Wall. Life Courses in the Transformation of East Germany. Stanford, California Stanford University Press, 44-64.

Grünheid, E. (2009): Überblick über die demographische Entwicklung in West- und Ostdeutschland von 1990 bis 2004. In: Cassens, I./ Luy, M./ Scholz, R. (Hrsg.): Die Bevölkerung in Ost- und Westdeutschland. Demographische, gesellschaftliche und wirtschaftliche Entwicklungen seit der Wende. Wiesbaden VS Research, 12-46.

Haisken-DeNew, J.P./ Frick, J.R. (2005): Desktop Companion to the German Socio-Economic Panel Study. Berlin GSOEP.

Heiland, F. (2004): Trends in East-West German Migration from 1989 to 2002. In: Demographic Research 11, 173-194.

Hunt, J. (2000): Why Do People Still Live in East Germany? In: IZA, Discussion Paper 123

Hunt, J. (2006): Staunching Emigration from East Germany: Age and the Determinants of Migration. In: Journal of the European Association 4(5), 1014-1037.

Jenke, S./ Lebok, U. (2009): Von Aufbau Ost zu Aldi-Ost. Deutsch-deutsches Konsumverhalten. In: Cassens, I./ Luy, M./ Scholz, R. (Hrsg.): Die Bevölkerung in Ost- und Westdeutschland. Demographische, gesellschaftliche und wirtschaftliche Entwicklungen seit der Wende. Wiesbaden VS Research, 334-367.

Kalter, F. (1997): Wohnortwechsel in Deutschland: Ein Beitrag zur Migrationstheorie und zur empirischen Anwendung von Rational-Choice-Modellen. Opladen Leske+Budrich.

Kreyenfeld, M. (2009): Das zweite Kind in Ostdeutschland: Aufschub oder Verzicht? In: Casseens, I./ Luy, M./ Scholz, R. (Hrsg.): Die Bevölkerung in Ost- und Westdeutschland. Demographische, gesellschaftliche und wirtschaftliche Entwicklungen seit der Wende. Wiesbaden VS Research, 100-123.

Mai, R. (2003): Abwanderunug aus Ostdeutschland Strukturen und Milieus der Altersselektivität und ihre regionalpolitische Bedeutung. Europäische Hochschulschriften Peter Lang. Frankfurt am Main. .

Mai, R. (2009): Effekte der Binnenmigration auf die Bevölkerungsentwicklung und Alterung in den Bundesländern. In: Cassens, I./ Luy, M./ Scholz, R. (Hrsg.): Die Bevölkerung in Ost- und Westdeutschland. Demographische, gesellschaftliche und wirtschaftliche Entwicklungen seit der Wende. Wiesbaden VS Research, 75-99.

Maretzke, S. (2009): Die Bevölkerungsentwicklung in den Regionen Deutschlands – Ein Spiegelbild der vielfältigen ökonomischen und sozialen Disparitäten. In: Cassens, I./ Luy, M./ Scholz, R. (Hrsg.): Die Bevölkerung in Ost- und Westdeutschland. Demographische, gesellschaftliche und wirtschaftliche Entwicklungen seit der Wende. Wiesbaden VS Research, 223-260.

Mayer, K.U. (2006): Society of Departure: The German Democratic Republic In: Diewald, M./ Goedicke, A./ Mayer, K.U. (Hrsg.) After the Fall of the Wall. Life Courses in the Transformation of East Germany. Stanford, California Stanford University Press, 1-28.

Mertens, A./ Haas, A. (2006). Regionale Arbeitslosigkeit und Arbeitsplatzwechsel in Deutschland – Eine Analyse auf Kreisebene. In: Jahrbuch für Regionalwissenschaft 26, 147-169.

Mincer, J. (1978): Family Migration Decision. In: Journal of Political Economy 86(5), 749-773.

Nivalainen, S. (2004): Determinants of family migration: short moves vs. long moves. In: Journal of Population Economics 17, 157-175.

Pollack, D. (1990): Das Ende der Organisationsgesellschaft: Systemtheoretische Überlegungen zum gesellschaftlichen Umbruch in der DDR. In: Zeitschrift für Soziologie 19, 292-307.

Roy, A.D. (1951): Some Thoughts on the Distribution of Earnings. In: Oxford Economic Papers 3(2), 135-146.

Sackmann, R. (2000): Fertilität im Transformationsprozess. In: Sackmann, R./Weymann, A./ Wingens, M. (Hrsg.) Die Generation der Wende. Wiesbaden Westdeutscher Verlag, 231-253.

Salzmann, T. (2009): Die unterschiedlichen bevölkerungsdynamischen Konsequenzen von Migration, Mortalität und Fertilität. In: Cassens, I./ Luy, M./ Scholz, R. (Hrsg.): Die Bevölkerung in Ost- und Westdeutschland. Demographische, gesellschaftliche und wirtschaftliche Entwicklungen seit der Wende. Wiesbaden VS Research, 48-74.

Schwarze, J./ Wagner, G. (1992): Abwanderung von Arbeitskräften und Einkommenspolitik in Ostdeutschland DIW Wochenbericht Nr. 59, 58-61.

Sjaastad, L.A. (1962): The Costs and Returns of Human Migration. In: The Journal of Political Economy 70, 80-93.

Snijders, T./ Bosker, R. (1999): Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling. London, Sage Publications.

Smiths, J. (2001): Career Migration, Self-Selection and the Earning of Married Men and Women in the Netherlands 1981-93. In: Urban Studies 38(3), 541-562.

Staatliche Zentralverwaltung für Statistik (1989): Statistisches Jahrbuch der Deutschen Demokratischen Republik. Berlin: Staatsverlag der Deutschen Demokratischen Republik.

Städtebaulicher Bericht der Bundesregierung (2004): Nachhaltige Stadtentwicklung – ein Gemeinschaftswerk. BT-Drucksache 15/4610.

Statistisches Bundesamt (2004): Datenreport 2004: Zahlen und Fakten über die Bundesrepublik Deutschland. Bonn.

Topel, R.H./ Michael P.W. (1992): Job Mobility and the Careers of Young Men. In: Quarterly Journal of Economics 107, 439-480.

Vishwanath, T. (1989): Job Search, Stigma Effect, and Escape Rate from Unemployment. In: Journal of Labor Economics 7(4), 487-502.

Wagner, G. (1992): Arbeitslosigkeit, Abwanderung und Pendeln von Arbeitskräften der neuen Bundesländer. In: Sozialer Fortschritt 4, 84-89.

Windzio, M. (2007): Regionale Arbeitslosigkeit und Distanz zur Grenze: Individual- und Kontexteffekte auf die Abwanderung von Arbeitskräften von Ost- nach Westdeutschland. In: Schmollers Jahrbuch 127, 553-583.

Windzio, M. (2006): The Problem of Time Dependent Explanatory Variables at the Context-Level in Discrete Time Multilevel Event History Analysis: A Comparison of Models Considering Mobility Between Local Labour Markets as Example. In: Quality & Quantity 40, 175-185.

Wooldrige, J.M. (2006): Introductory Econometrics A Modern Approach. 3rd ed. Mason, South Western.

Zaiceva, A. (2007): East-West Migration and Gender: Is there a "Double Disadvantage" vis-à-vis Stayers? IZA Discussion Paper No. 2810.

Care-Giver Migration to Greying Japan

Gabriele Vogt

1. Introduction

Japan is among the fastest aging and – as of 2005 – shrinking nations of the world. The life expectancy of Japanese men and women is among the highest, the total fertility rate among the lowest of all industrialized societies. Japan's National Institute of Population and Social Security Research (NIPSSR), a think-tank under the Ministry of Health, Labour and Welfare, predicts that by 2050 Japan will have lost twelve per cent of its population of 127.7 million. The population decline will be particularly pronounced among the working age population (15-64 years of age). This is what troubles politicians and business leaders most, since a decline in working age population, triggers labor shortages. When accompanied by an increase in elderly population, as it is predicted for Japan, it furthermore puts serious strains on the nation's social security systems.[1]

Numerous countermeasures to the economic impacts resulting from this decline in working age population are currently being discussed in the political realm. Among them are delayed pension age, rising female workforce participation, continuous "robotization" of workplaces, and, in this very order of preference, international labor migration to Japan. With a mere 1.69 per cent of Japan's population holding a migratory background, international migration is new terrain to the nation's politicians, business leaders, and citizens. Large-scale international labor migration has never been a serious policy option for Japan: neither during the high-growth period of the post-War years, nor during the bubble economy of the late 1980s – although both periods of relative growth immediately resulted in shortages in Japan's domestic labor market. For many decades, international labor migration to Japanese politicians has been some sort of Pandora's Box: Do not open the door, unless you are prepared to face the manifold problems that will without any doubt walk in.

Times have changed. This paper argues that migration policy, a hitherto taboo-loaden and inflexible policy field in Japan, has been shaken up by the alarming

---

1 Readers interested in general demographic trends in Japan might find it inspiring to also refer to Coulmas (2007), Coulmas et al. (2008), Kōno (2007) and Yamada (2007).

numbers involved in Japan's population aging and shrinking. Demographic change is the main factor driving Japan's current migration policy reform. In this paper, I will clarify the causal relationship between demographic change and migration policy reform through a case study on the international migration of Indonesian care givers to Japan (section 4). The policy process which lead to this newly established form of international care-giver migration to Japan shall be studied by placing the focus on the activities of national-level political actors. Sections 2 and 3 will offer an introduction in the facts and figures important to Japan's demographic change respectively into Japan's migration policy guidelines and the structure of Japan's migration population. Section 5 will summarize the main findings and put them into perspective of the ongoing dicourse on the future of Japan's migration policy.

2. Demographic Change in Japan: Fundamentals

Figure 1:   Population development in Japan populations in 1,000s*
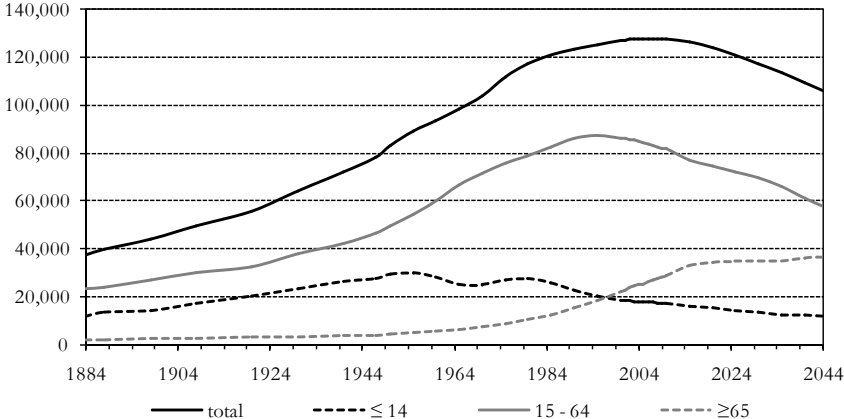
*Source: National Institute of Population and Social Security Research (NIPSSR), 2006.

As of September 2008, a record high of 36,276 centenarians were living in Japan (JT 2008/09/13). The average life expectancy for those born in 2004 is 78.64 years for

men and 85.59 years for women.[2] The median age of the Japanese population is to increase from 42.7 years in 2004 to 49.8 years by 2025 and 53.4 years by 2050. Japan is a hyper-aged society. It is also a depopulating society. With a total fertility rate of 1.29 and net reproduction rate of 0.62 (2004), Japan is, what Billari coined a society of lowest-low fertility (TFR below 1.30). As of 2005, Japan entered a phase of population decline, that is, the per anno number of deaths surpasses the numbers of births plus immigration. Official data predict that the population decline will proceed rapidly: The total population is to drop from 127.7 million in 2004 to 100.6 million by 2050 (Atoh, 2008: 5-24; NIPSSR, 2006) (Figure 1).

Figure 2:   Age-dependency ratios in Japan*
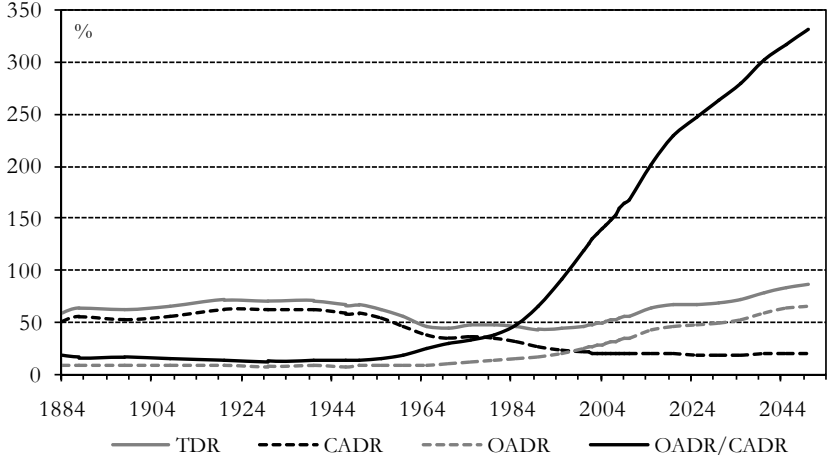
*Source: National Institute of Population and Social Security Research (NIPSSR), 2006.
TDR = Total Dependency Ratio ($[P_{\geq 65} + P_{\leq 14}]/P_{15\text{-}64}$).
CADR = Child-Age Dependency Ratio ($P_{\leq 14}/P_{15\text{-}64}$).
OADR = Old-Age Dependency Ratio ($P_{\geq 65}/P_{15\text{-}64}$).

The impact of the aging and shrinking of Japan's population on the nation's society, culture, politics, and economics are manifold (Coulmas et al., 2008). Currently at the center of attention within Japan's "demographic policies" is the growing imbalance in Japan's dependency ratio and its impacts on the economy in general and the

2 The latest available dataset on population development in Japan was published by the National Institute of Population and Social Security Research (NIPSSR) in 2006. This dataset uses real case data until 2004, and predictions beyond that year.

social security system in particular. While Japan's old-age ratio (≥65 year old in per cent of total population) stands at 19.48 per cent (2004), it is predicted to rise to 28.7 per cent by 2025, and to 35.7 per cent by 2050. Accompanied by population decline, this development translates into an old-age dependency ratio (≥65 year old per 15-64 year old) of 29.2 per cent in 2004, of 48.0 per cent by 2025, and of 66.5 per cent by 2050. Over the same course of time, the ratio of the old age population (≥65) to children (≤14) is to triple. Hence, the speed of Japan's population aging and decline is to accelerate further (NIPSSR, 2006) (Figure 2).

Japan's politicians address the nation's population aging and shrinking through numerous policy measures which for decades have been centered on family and old-age welfare policies. Only recently, however, did the third demographic variable, migration flows, become an issue of political debate in Japan (Vogt, 2008: 17-29). The debate on international migration to Japan as a countermeasure to population aging and shrinking was initiated by the United Nations Population Division's (UNPD) 2000 publication on *Replacement Migration: Is it a Solution to Declining and Ageing Populations?* [3] According to this report, Japan would need to see extremely high numbers of immigration, were it to, for example, keep its total dependency ratio (sum of ≥65 year old and ≤14 year old per 15-64 year old) constant at the level of 1995. This scenario would require a migration of 553 million persons to Japan by 2050. By then the total population would amount to 818 million, with 87 per cent of them being migrants and their descendents (UNPD, 2000) (Table 1).

Table 1:   Labor migration to Japan by 2050, shown in three scenarios*

	Population at 1995 level	Working age population (15-64) at 1995 level	Ratio of working to non-working population at 1995 level
Total number of immigrants necessary	17 million	33.5 million	553 million
Number of immigrants necessary per year	381,000	609,000	10 million
Total population in 2050	127 million	151 million	818 million
Percentage of immigrants in total population in 2050	18%	30%	87%

*United Nations Population Division's (UNPD), 2000.

---

3 Among demographers the methods UNPD used to create the report were deemed contentious. Also, it should not go unnoticed that rather than with actual population development and practical policy suggestions, the report was concerned with "playing numbers."

Japanese politicians of all parties dismissed the UNPD numbers as astronomic. The numbers did, however, initiate a national political and public debate on demographic pressure and migration policy reform, which resulted – as will be argued in section 4 – in the most recent and first major shift in Japan's migration policy since the end of World War Two. In order to clarify the dimension of this policy shift, the following section (section 3) will outline the structure of what hitherto represented Japan's non-immigration policy.

3. Japan's Migration Policy: Fundamentals

As of 2007, 2.2 million registered foreign nationals were living in Japan. This amounts to 1.69 per cent of Japan's total population. However small-scale in inter-national comparison the numbers have been on the rise steadily, in particular since 1990 (Figure 3).

Figure 3: Registered foreign residents in Japan (Ministry of Justice: 2007, 2008)
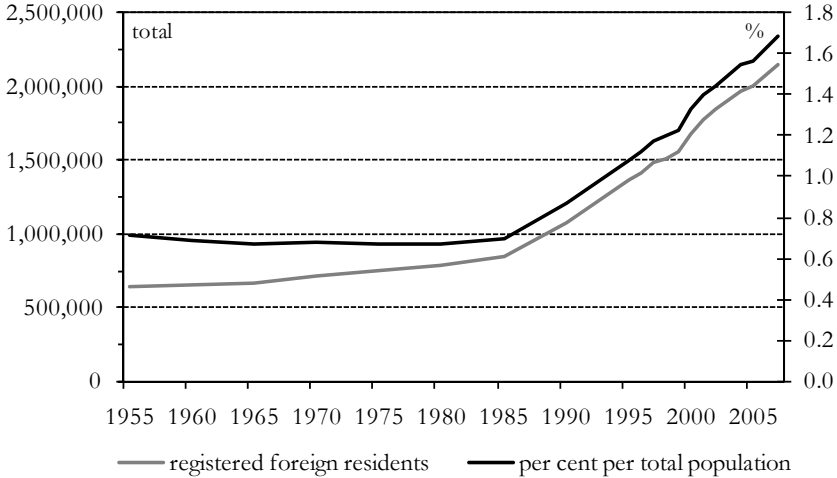
1990 marks the year of the latest fundamental revision of Japan's Immigration Control and Refugee Recognition Act, which opened numerous back doors for labor migration to Japan, but kept the front door firmly shut. Japan's official migra-tion policy still reads in a nutshell: "labor migration only for the highly skilled" and "only on a temporary basis." A closer look at the structural characteristics of Japan's

migration population, as they resulted from the 1990 law revision, will, however, bring to light a significant gap between *policy output* (guidelines) and *policy outcome* (reality).

The numbers of four of the five largest groups of registered foreign residents in Japan have risen steeply since 1990: the numbers of Chinese, Brazilians, Filipinos, and Peruvians. Only the group of Koreans in residence saw a decline in numbers. In 2007, for the first time in 90 years, Koreans were not Japan's largest immigrant group, but came in second place after the Chinese (MOJ, 2008) (Figure 4).

Figure 4: Japan's registered foreign residents according to nationality (Ministry of Justice: 2007, 2008)
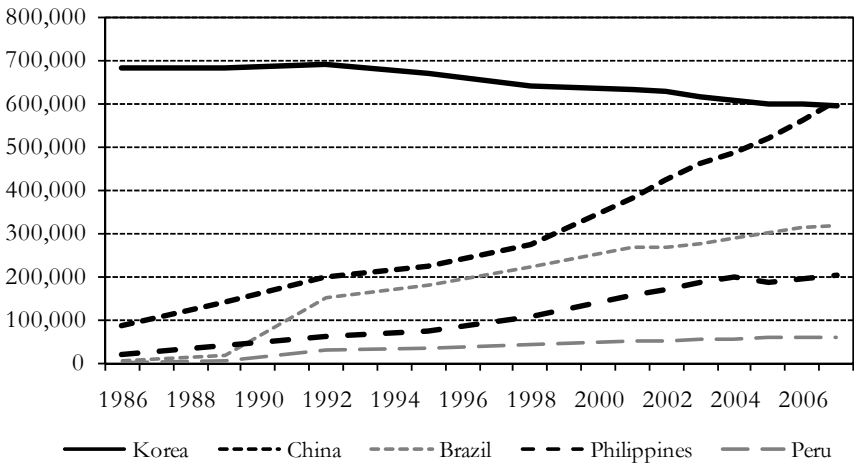
The relatively large number of Korean residents in Japan has historic origins. From 1939, the Japanese war-time industry recruited workers from the annexed (1910-1945) Korean peninsula. After the end of World War Two some hundred thousand Koreans opted to stay in Japan rather than return to Korea. They and their descendents currently reside in Japan as "special permanent residents." The recent decline in their number has two reasons: First, the mortality of the aged first generation of migrants, and secondly the growing number of naturalizations which in particular younger generations of Koreans in Japan opt for.

The population increase of three of the four largest growing nationality groups of registered foreign residents in Japan (Chinese, Brazilians, and Peruvians) is directly linked to the 1990 revision of the Immigration Control and Refugee Recognition Act: The recent rise in numbers of Chinese residents in Japan has been

particularly pronounced. Ever since the turn of the millennium, the number of Chinese residents in Japan has doubled; currently more than 600,000 Chinese nationals are living in Japan. Breaking down this number according to visa categories held by Chinese residents in Japan, it becomes evident that they are one of the nationality groups who profit most from the 1990 law revision. This revision made the trainee program accessible to small and medium sized companies of 20 or less employees. Additionally, in 1993, a technical trainee program was introduced. Both programs are officially run as a measure of development aid policy. They aim at fostering knowledge and skill transfer into developing countries. More than three quarters of all holders of a trainee visa in Japan are Chinese. In 2006 alone, more than 60,000 new trainees arrived from China (MOJ, 2007).[4]

The reality of the trainee program, however, does not look as altruistic as the program guidelines read: Large numbers of trainees work as low-wage labor in the textile industry and in agriculture. Skill and knowledge transfer rarely happens. Ippei Torii, chairman of Japan's largest union for foreign workers (Zentōitsu) reports hourly wages of 300 Japanese Yen (roughly € 2) being paid. Since there is no work contract between a trainee and the company s/he works for, the intern does not have access to legal remedies (Torii, 2007/10/24). Japan's trainee program has come under severe international criticism as violating human rights. By now, influential political actors such as the Ministry of Health, Labour and Welfare and the Japan Business Federation are calling for a reassessment of the program.[5]

The trainee system de facto is an avenue for labor migration of the low-skilled to Japan. So is the system that grants long-term residency to descendents (up to the third generation) of Japanese nationals. These so-called Nikkeijin come to Japan mostly from South-American countries, in particular from Brazil and Peru. The 1990 law revision introduced the visa category of "long-term resident," designed to enable Nikkeijin to embark on a path of return migration to Japan. The majority of Nikkeijin in Japan are Brazilian nationals. They are descendents of the 190,000 Japanese who emigrated to Brazil until 1942. By the end of the 1980s, the Japanese community in Brazil had grown to more than one million. Since the 1990 law revision, the Japanese-Brazilian community in Japan has quintupled to its current size of a population of over 300,000. Nikkeijin in Japan are predominantly found as workers in the automobile and electric industries.

---

4 Furthermore, many Chinese who came to Japan under visa categories such as a trainee visa, which grants a short-term resident permit, opt to stay in Japan and acquire permanent residency. Over the course of five years, from 2002 to 2006 the number of Chinese nationals holding permanent residency in Japan almost doubled from just about 70,000 to more than 117,000 persons (MOJ, 2007).
5 In spring 2008 the government of Japan started debating a bill that would allow interns to be covered by labor standard laws and minimum wage laws (JT, 2008/03/26).

Then Senior Vice Minister of Justice, Tarō Kōno, in an interview with the author in February 2006 affirmed that the implementation of a de facto Nikkeijin-visa had indeed a very pragmatic background. Nikkeijin were willing to take on simple work in low wage professions. The fact that they were descendents of Japanese nationals lead politicians to the assumption that it would not be necessary to address policy measures supporting the social, cultural or even economic integration of the new migrants. Jumping to the conclusion that a blood-line relationship with the country of destination would compensate for comprehensive integration policy measures, was a huge mistake, Kōno said.[6]

While the *output* of Japan's migration policy limits labor migration to Japan to a temporary migration only of the highly skilled, the actual policy *outcome* shows a vastly different picture. Breaking down registered foreign residents in Japan according to their visa categories, we see that 64.8 per cent hold either a permanent (mainly Korean) of long-term (mainly Nikkeijin) resident permit or reside in Japan indefinitely as spouse or child of a Japanese national. There is no obligation to proof any high level of professional qualification in order to acquire any of these visa statuses. Add to these 64.8 per cent another 14.2 per cent of holders of various student visas (limited work permit) and trainees (on-the-job training), the ratio of low-skilled workers among Japan's registered foreign residents may amount to 79.0 per cent (Figure 5).

---

6 Cultural anthropologists Roth (2002) and Tsuda (2003) did extensive research on integration problems among Japan's Nikkeijin community.

Figure 5:   Japan's registered foreign residents according to status of residency (MOJ, 2008)
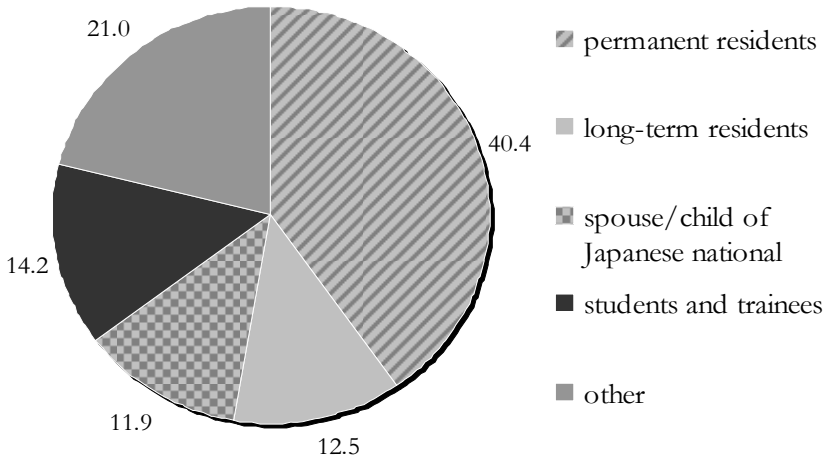
The 1990 revision of Japan's Immigration Control and Refugee Recognition Act opened up two major avenues of low-skilled labor migration to Japan: the trainee and Nikkeijin immigration systems. Both are vividly being made use of. This suggests that on the one hand, there is a real economic need in Japan for low-wage foreign labor (pull), and that there also is a large enough pool of potential migrants willing to come to Japan (push). On the other hand, we still witness a national migration policy in Japan that not only neglects the economic need for labor migration, but also is concerned almost exclusively with issues of border control rather than with formulating a comprehensive approach to migration and integration policies. In the following it will be argued that the factor which has the potential to fundamentally reform Japan's migration and integration policies is demographic change. The aging and shrinking of Japan's population in general and the workforce in particular has created a new and extraordinarily strong pull-factor within Japan's migration system.

4. Care-Giver Migration to Japan

Japan's demographic change initiated a public and political debate on whether labor migration to Japan can be a countermeasure to the negative economic impacts the accelerating shrinking and aging of the population is expected to bring about. One

of the results of this debate is the formation and – as of August 2008 – implementation of two Economic Partnership Agreements (EPA) between Japan and Indonesia (2007) respectively the Philippines (2006). Both EPA pave the way for labor migration of care-giving personnel from these countries to Japan. The following subsections will introduce the structural details of labor migration via these bilateral EPA (subsection 4.2), highlight the negotiations leading to the agreement (subsection 4.3) as well as the situation "on-site" (subsection 4.4) and discuss the relevance of this new avenue of labor migration to Japan for the nation's migration policy (subsection 4.5). Ahead of this case study, however, some facts and figures on population aging and Japan's health-care sector (subsection 4.1) shall be introduced. This will help to clarify the special importance of the health-care sector for Japan's migration policy reform.

4.1 Population Aging and the Health-Care Sector

It is no coincidence that the health-care sector[7] is at the forefront of the ongoing major shift in Japan's migration policy. This sector directly faces the challenges of a speedily progressing population aging. As shown in section 2, Japan's old-age ratio (≥65 year old in per cent of total population) is predicted to rise from 19.48 per cent in 2004, to 28.7 per cent by 2025, and to 35.7 per cent by 2050 (Figures 1 and 2). Population aging is directly mirrored in growing numbers of elderly in need of health-care. Japan's Ministry of Health, Labour, and Welfare calculated that the personal risk of being in need of health-care services rises from 3.8 per cent for a 65 year old to 24.1 per cent for a 75 year old. With the median age of the Japanese population increasing from 42.7 years in 2004 to a predicted 49.8 years by 2025 and 53.4 years by 2050, the percentage of elderly facing the personal risk to be in need of health-care is on the rise as well. As of September 2007, Japan's state-run insurance system for long-term care for the elderly (Kaigo Hoken) has acknowledged 4.5 million people as beneficiaries. The number is expected to rise to 8.4 million by 2025 (MHLW, 2007; NIPSSR, 2006; Yashiro, 2008).

The number of elderly claiming financial support via the long-term care insurance is likely to rise even further as Japan faces a changing attitude toward institutional care. Over the course of less than a decade, between 1995 and 2003, a mind-shift among both the care-receiving generation and the care-giving generation took place. The number of elderly, who expect their children to provide health-care for them once they need it, fell from 57.3 per cent in 1995 to 48.6 per cent in 2003. At

---

7 For a general introduction into Japan's health-care sector in a comparative perspective please refer to Ikegami/Campbell (2007) and to Long (2000); for gender aspects of elderly care in Japan to Long et al. (2009).

the same time, the number of children stating that they do not feel any obligation to provide health-care for their parents rose from 28.7 per cent to 36.1 per cent (CAO, 2004). This changing attitude has at least two reasons: It reflects, firstly, changing family structures in general and changing gender roles in particular, since in Japan care-giving is a task that traditionally has been laid upon the daughters or daughters-in-law. Nuclearization of families proceeds and female workforce participation is at higher rates than some decades ago. Thus, the families, in particular the women in the families, are no longer able to provide full-time care for family members. The second reason for the changing attitude toward care-giving and care-receiving has its root in a structural change. In April 2000, the Long-term Care Insurance Law came into effect, making institutional care accessible to the elderly, even to the economically disadvantaged elderly. At the same time the societal taboo of relying on care provided outside the family started to fade (Campbell, 2008; Campbell/Ingersoll-Dayton, 2000; Fukawa, 2008). Care-giving can be expected to be further institutionalized in Japan, and the numbers of patients in homes for the elderly and hospitals providing predominantly elderly health-care will rise.

Yet, not even today does the number of care-giving personnel match the number of staff necessary to cope with patient numbers. While the number of health facilities for the elderly more than doubled between 1996 and 2005 (from 13,181 to 35,494 facilities), the number of care-givers remained rather low. The ratio of care-giving personnel per 1,000 population in Japan is still the lowest among major industrialized countries. It currently stands at 6.4 care-givers per 1,000 population in Japan. The ratio of job openings to job applicants in the health-care sector is 2.03, while in the sector average it is 1.00 with slight seasonal variation. The health-care profession is furthermore characterized by an exceptionally high turn-over rate: Only one quarter of care-giving personnel is 45 years or older. An estimated number of close to half a million trained Japanese care-givers work in other professions (JNA, 2008; SBSRTI, 2007). As data by the Japan Nursing Association shows, it is this lack of personnel rather a lack in facilities that is at the core of Japan's crisis in the health-care sector (Figure 6). The shortage in personnel is already evident today and will become even more pronounced with the number of elderly in need of care rising steadily.

Figure 6:   Care-giving personnel and beds in health-care institutions per 1,000 population (Japan Nursing Association: 2008)
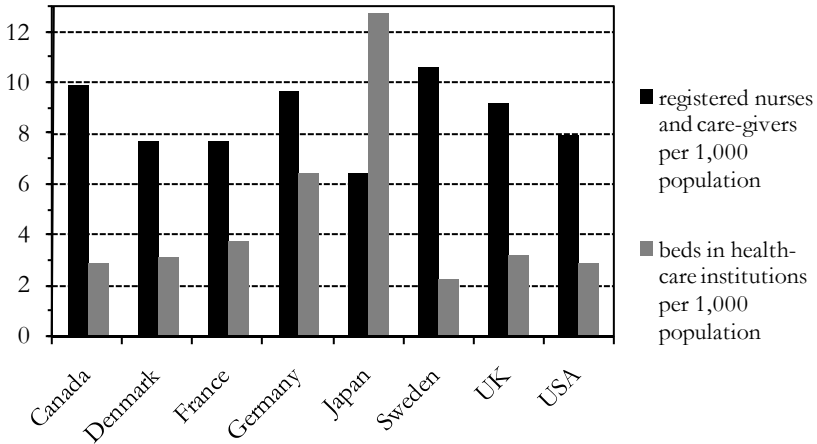
4.2 Japan-Indonesia EPA: Content

Who is going to provide health-care services to Japan's aging population? Japanese politicians have decided to embark on the path of international labor migration as one policy measure addressing the present and future labor shortages in the nation's health care sector. This is a remarkable step for Japan, a nation that during none of the economic high-growth periods of the past decades used international labor migration as an open policy option. As the 1990 revision of the Immigration Control and Refugee Recognition Act shows, it may, however, very well have been a *hidden* policy option. With the bilateral Economic Partnership Agreements, which openly promote care-giver migration to Japan, the nation is entering a new era of its migration policy.[8]
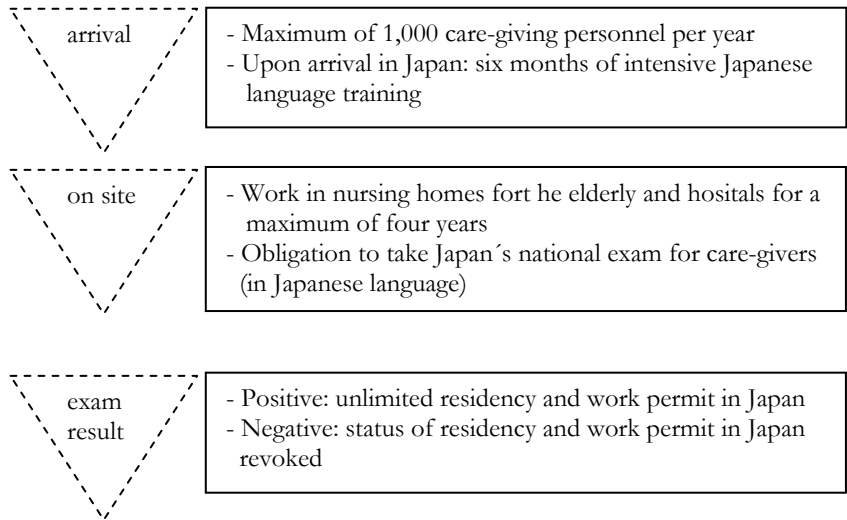
Both EPA, the Japan-Philippine EPA (2006) and the Japan-Indonesia EPA (2007) state that "Entry and temporary stay […] shall be granted to […] natural persons who engage in supplying services as nurses or certified care-workers." (JPEPA Article 110/1/f). The EPA distinguish between nurses (Kangoshi) and

---

8 Neither EPA focuses solely on migration issues. Rather, they cover numerous bilateral issues, most of which deal with trade tariffs.

certified care-workers (Kaigo fukushi-shi). Nurses are to work in hospitals that primarily provide health-care for the elderly; certified care-workers are to work in nursing homes for the elderly. The EPA state that in order for their application to be considered, nurses need to proof some working experience in the field in their countries of destination, while certified care-workers are to be graduates of a four-year university holding a degree relevant to the care-giving profession. The EPA open up Japan's labor market to 400 nurses and 600 certified care workers per nation per year.

Upon arrival to Japan, the care-givers need to take part in a six-month intensive course in Japanese language and culture. After successful completion they are dispatched to various hospitals and nursing homes, with preferably at least two foreign care-givers joining one institution. They will then work for three years (nurses) respectively four years (care-workers) before facing the national exam for care-givers – the exam is to be taken in Japanese language. If they fail the exam, their resident and work permit is revoked. In case they pass the exam, Indonesians will be granted an indefinite resident and work permit to Japan, while care-workers from the Philippines will be granted renewable three- respectively four-year visa and work permits (Figure 7).

Figure 7: Care-giver migration under the Japan-Indonesia economic partnership agreement

arrival	- Maximum of 1,000 care-giving personnel per year - Upon arrival in Japan: six months of intensive Japanese language training
on site	- Work in nursing homes fort he elderly and hositals for a maximum of four years - Obligation to take Japan´s national exam for care-givers (in Japanese language)
exam result	- Positive: unlimited residency and work permit in Japan - Negative: status of residency and work permit in Japan revoked

The content of the EPA reflects a compromise reached in negotiations between numerous political actors and interest groups in Japan.[9] The negotiations centered on two main questions: First, who should be allowed to work in Japan? Secondly, for how long should the migrants be granted a resident and work permit? These two questions put onto the political debate what hitherto had been considered the two basic principles of Japan's migration policy, or rather non-immigration policy. The fact that these two questions were at the center of debate and were decided upon quite differently from what the guidelines hitherto read, leads to the argument that the formation – and by now implementation – of the EPA symbolizes a milestone in Japan's migration policy.

Not unusual within Japan's political system it was not the political parties but the national-level government ministries that drove the negotiations. The most radical positions were coined on the one hand by the Ministry of Justice (MOJ) and on the other hand by the Ministry of Economy, Trade and Industry (METI). The Ministry of Justice heads the Immigration Bureau of Japan, and thus is the leading authority for questions concerning (labor) migration to Japan. MOJ for years has been a powerful political actor holding high the two migration policy guidelines of "exclusively highly skilled" and "exclusively temporary" migration. MOJ is primarily concerned with issues of border control. It was an outspoken advocate of Japan's new immigration procedure: Starting in November 2007 foreign nationals entering Japan need to have their fingerprints and a digitalized portrait picture taken.

MOJ also initiated the campaign "lawful internationalization" (Rūru wo mamotte kokusaika) which over the past years has contributed to a decrease in the number of irregular migrants in Japan: from roughly 220,000 in 2003 to 170,000 in 2007. Part of the campaign is a MOJ-administered website that allows to anonymously insert data on the place of living/working of foreign nationals suspected to be in Japan in an irregular state of residency.[10] For this website, MOJ has been critized harshly by International Organizations, and even within the ministry the site

---

9 The focus will be placed on the negotiations among Japanese political actors, since the economic superpower Japan in the negotiations of both agreements played the leading role. The 2007 Japan-Indonesia EPA came into effect in summer 2008. The 2006 Japan-Philippines EPA, however, was ratified by the Philippine Senate only in October 2008. Numerous issues regulated within the EPA were perceived to be highly contentious by the Philippine Senate. These include, for example, the export conditions of agricultural products, but also the relatively small dimension of care-giver migration that is being made accessible via the EPA. For a country of 7.3 million labor migrants, whose officially recorded remittances average some five per centper cent of the nation's GDP, an additional avenue of one thousand labor migrants per year cannot be considered a particularly attractive economic opportunity (Nemezo, 2006/02/02; O'Neil, 2004).

10   The site can be accessed via this URL: https://www.immi-moj.go.jp/immimail/datainput.php

meanwhile has been considered "unfortunate." Yet, MOJ is holding onto Japan's official migration policy guidelines. A new approach such as nation-specific and sector-specific labor migration via EPA is, as then Senior Vice-Minister of Justice Tarō Kōno put it, nothing of concern to MOJ. The Ministry would not support such a migration policy which will inevitably lead to an imbalance among Japan's migration population thereby causing a root for public safety problems. Furthermore, there was no need for such a short-handed migration policy reform, since the labor shortage induced by workforce shrinking could be filled through a higher female workforce participation, and workforce participation of Japan's NEET, that is young people *Not* in *Employment*, *Education* or *Training* (Kōno, 2006; MOJ, 2007, 2008).

At the other end of the negotiation spectrum stands Japan's Ministry of Economy, Trade and Industry (METI), which has been largely backed by the Ministry of Foreign Affairs (MOFA) and interest groups such as the Japan Business Federation, Nippon Keidanren. These three central pro-EPA actors all highlight the economic benefits that will accompany the agreement. On the occasion of the coming into effect of the Japan-Indonesia EPA on July 1, 2008, the foreign ministers of both countries gave a joint press conference stressing that the agreement "will enable both countries to make the most of their economic complementarities and further promote the development of their respective economies." (MOFA, 2008).

While MOFA as Japan's leading entity when it comes to foreign policy is most concerned with international relations and partnerships, METI and the Japan Business Federation in their support of the EPA bring forward arguments dealing with the national economy. Both stress the labor shortages in Japan's health-care sector, not without also hinting to other industries such as shipbuilding, where the aging and shrinking of the workforce has already started to translate into labor shortages, too. The Japan Business Federation is especially interested in a pick-and-choose migration policy. The Federation recently argued that foreign nationals with technological skills in specific sectors or industries should be invited to work in Japan, however, on a basis of temporary contracts (JT, 2007/03/15). Even back in its 2003 paper, *Japan 2025, Envisioning a Vibrant, Attractive Nation in the Twenty-first Century* the Federation argued that a "vibrant diversity" – brought along through a rising number of foreign nationals employed in Japan – was crucial for the well-being and the success of Japan's society and economy. Against the backdrop of a harsh economic competition with China, the importance of Japan as an (outward *and* inward) internationally competent global player is to increase even further (Inoue, forthcoming).

Japan's Ministry of Health, Labour and Welfare in recent years proofed to be the most influential negotiator when it came to structuring the features of Japan's migration policy reform. A close ally to the Japan Nursing Association (JNA), the Ministry initially adopted JNA's outspoken opposition to care-giver migration via

EPA. It called for improving the working conditions in the low-wage and low-prestige care-giving professions, in order make the profession attractive to the younger generation, and to create incentives for those trained care-givers that left the profession for other jobs to return to care-giving. This goal is still at the heart of MHLW politics.

The Ministry, however, adopted a more pragmatic stance in negotiations, finally supporting the bilateral agreement, however not without imposing on one condition: the linkage between resident/work permit and the outcome of the national care-giver examination. This condition was fiercely lobbied for by the Japan Nursing Association, which states that passing the exam is necessary in order to ensure that the quality of care-giving will not drop once the number of foreign care-givers in Japan was to rise. The exam, however, is a very high hurdle for migrants to take, since it not only requires a high professional competency but also a high level of proficiency in written and spoken Japanese (Vogt, 2007). Even among the examinees of January 2008 – at that time the EPA had not yet come into effect – only 30.6 per cent passed the exam (MHLW, 2008). One can only imagine how difficult it will be to pass the exam for persons who started to study the Japanese language after arrival in Japan: six months in an intensive course followed by a maximum of four years of on-the-side studies while working fulltime as care-givers. This exam might prove to be a hurdle too high for migrants to take. The ones who will suffer from the result of this regulation are the patients.

4.4 Japan-Indonesia EPA: On-Site

For the first year of international care-giver migration via the bilateral EPA, Japan had initially aimed to accept only 500 care-givers, and study the implementation process as a pioneering project. However, only roughly 40 per cent of the targeted number, that is 208 care-givers (evenly divided up into the categories of nurses and certified care-workers) actually came to Japan. Two reasons lie behind the number falling significantly short of what had been aimed for. First, the screening process of Indonesian candidates by Japanese authorities had only begun in June 2008. The Indonesian government claimed that it had not been given enough time to publicize the opportunity to work in Japan. Thus, only a small pool of candidates had been recruited. Secondly, 20 per cent of the potential care-migrants who passed Japan's screening process (a total of 294 care-givers), could not be matched with hospitals and nursing homes for the elderly in Japan. The Japan International Corporation of Welfare Services (JICWELS) which is in charge of matching the candidates and institutions, reported that 66 of the 86 candidates who could not be matched were male (Kobayashi/Sato 2008/08/01). This suggests that gender next to nationality poses yet another boundary for potential employees in the health-care sector.

The response of directors of hospitals and nursing homes for the elderly toward international care-giver migration is mixed in general: A survey conducted by the Kyūshū University Asia Center in February 2008, showed that the division of those willing to hire foreign personnel to those not willing to do so stands at almost 50/50. Those supporting the system say that international care-giver migration to Japan will ease staff shortages, contribute to promoting international exchange and improve the quality of nursing services. Those opposing the system say they are concerned about language problems and possible refusal of foreign staff by patients and their families (AS, 2008/11/03). Earlier studies by the Kitakyūshū Forum on Asian Women (Shinozaki, 2007) add to this picture a regional dimension: While 57.6 per cent of directors of hospitals and nursing homes for the elderly in Tokyo agreed to hire foreign personnel, only 35.3 per cent of those in Fukuoka, in Western Japan, did. This result reflects the varying degree of internationalization in Japan, for example measured through the percentage of non-Japanese per total population.

By February 2009, the first generation of Indonesian care-migrants to Japan will have finished their Japanese language education and will start working in 98 hospitals and nursing homes for the elderly dispersed over 34 of Japan's 47 prefectures. In three to four years, when this first generation will need to face the national care-worker examination, the success or failure of this program will become evident. This will be a crucial point determining the future of the program. In case the rate of those passing the exam is not significantly below the rate of the Japanese nationals' examination results, international care-giver migration to Japan may be an option for the future, too. It may even be a test field that after a positive evaluation could lead to expanding this system of nation- and sector-specific migration to other nations and other sectors. Should the evaluation end on a negative note, one can expect the system to be either terminated or continued under a different notion of accepting care-giving assistants for a fixed period of time. That is, the system would then be likely to be redefined as a migration system for low-skilled workers on a temporary basis.

4.5 Japan-Indonesia EPA: Relevance

International care-giver migration to Japan via the bilateral EPA with Indonesia marks a milestone for Japan's migration policy. This is the first time for Japan to officially open the national labor market to a not-highly-skilled workforce with a long-term settlement perspective. This pattern exactly has been the *outcome* of Japan's migration policy for some time (Figure 5). What is new, however, is that by now this also has become the policy *output*, that is, a guideline that states which structure of migration policy should be followed. International care-giver migration to Japan via the bilateral EPA with Indonesia thus symbolizes a rare case of *policy*

output being adjusted to match *policy outcome*. Regulations for what has hitherto been considered irregularities, the migration of low-skilled workers such as trainees and Nikkeijin, are being formulated and implemented. This policy change comes under the economic pressure introduced to the care-giving sector as a result of population aging and shortages in the labor force, already obvious in this sector. At this point, however, we do not yet witness any major revisions of the Immigration Control and Refugee Recognition Act that would reflect this new direction of Japan's migration policy. A law revision might follow after a positive evaluation of the EPA migration system three or four years down the road. In this sense, we can classify the ongoing changes a "political paradigm change in a test phase."

5. Conclusion

Migration policy, a hitherto inflexible policy field in Japan, has been shaken up by the alarming numbers involved in Japan's population aging and shrinking. The economic impacts of the nation's demographic change can already be observed in the health-care sector: A rising number of elderly are in need of health-care. Care-giving personnel, however, already is rare; if their numbers were not to increase significantly, a severe shortage of care-givers will become apparent in as little as 15 years from now. It is thus no coincidence that the health-care sector is at the fore-front of Japan's migration policy reform. This reform in a nutshell reads "adjusting *policy output* to *policy outcome*." That is, the new guidelines of Japan's migration policy provide a framework for the immigration of not-highly skilled and offer to them a perspective for long-term settlement in Japan. This migration pattern in fact has long been a practice for trainees and persons of Japanese descent. Even so, the number of registered foreign residents in Japan only amounts to 1.69 per cent of the overall population. Under the EPA system, care-giver migration to Japan of 1,000 persons per year per nation is made possible. This will not lead to a significant in-crease in the ratio of registered foreign residents in Japan. It will most likely not even be enough to ease the labor shortage in the health-care sector.

Japan's political and public discourse on international migration as a counter-measure to population aging and shrinking still is a highly contentious one. Demog-rapher Atoh argues that the Japanese economy cannot but fill labor shortages with foreign workers: "As a result, Japanese society will move much more towards a multi-ethnic or multi-cultural society in this century." (Makoto, 2008: 21). Econo-mist Matsutani (2006), on the other hand, calls international labor migration a "non-solution" to demographic changes. He argues that migration is no solution since it does nothing but delay the occurrence of the problem of workforce shrinking. One of Japan's leading intellectuals, economist Tachibanaki (2006), cautions against migration for the sake of the stability of Japan's labor market. He argues that an

influx of foreign workers would in the long-run lead to the emergence of a new underclass and trigger social instabilities.

Whether or not international labor migration to Japan will come with these negative societal impacts, largely depends on how migration policy will be implemented. It will depend in particular on whether or not a societal, economic and also cultural integration of migrants will be part of this new migration policy. Only in the fall of 2006, was integration (tōgō) first mentioned in an official government document in Japan. The Ministry of Internal Affairs and Communication (MIC) stated that adjusting to rising numbers of registered foreign residents, integration policy measures have become necessary. Integration was to be achieved through multicultural coexistence. Other groups within the MIC argue for a more inclusive approach of multicultural community building.[11] At this point there is no consensus in Japan over the meaning of integration policy. This would, however, be necessary now that Japan for the first time seems to embark on a path of extended international immigration.

It is population aging and shrinking that proofs to be a powerful new push factor for Japan's migration policy. Japan has just entered a test phase of opening its labor market to sector- and nation-specific immigration flows. A first comprehensive evaluation of this new policy will be possible three to four years from now when the first generation of care-migrants to Japan will face the national care-giver examination. By then Japan's political actors will need to determine whether EPA-guided labor migration channels will be kept open, maybe even expanded, or else terminated.

---

11   On the concept of multicultural community building, for example see Yamawaki/YSIS (2006).

References

Asahi Shimbun, A.S. (2008/11/03): Foreign nurses OK at 46% of hospitals. http://www.asahi.com/english/Herald-asahi/TKY200803110110.html.

Atoh, M. (2008): Population Growth during the Past 100 Years. In: Coulmas, F./ Conrad, H./ Schad-Seifert, A./ Vogt, G. (Eds.):The Demographic Challenge. A Handbook about Japan. Leiden/Boston: Brill, 5-24.

Campbell, J.C. (2008): Politics of Old-Age Policy-Making. In: Coulmas, F./ Conrad, H./ Schad-Seifert, A./ Vogt, G. (Eds.):The Demographic Challenge. A Handbook about Japan. Leiden/Boston: Brill, 653-665.

Campbell, R./ Ingersoll-Dayton, B. (2000): Variations in family caregiving in Japan and the US. In: Long, S. O. (Ed.):Caring for the Elderly in Japan and the US. London/New York: Routledge, 231-247.

CAO, Cabinet Office, Government of Japan (2004): Kōreisha kaigo ni kansuru yoronchōsa. http://www8.cao.go.jp/survey/h15/h15-kourei/index.html.

Coulmas, F. (2007): Die Gesellschaft Japans. Arbeit, Familie und demographische Krise. Munich: C. H. Beck.

Coulmas, F./ Conrad, H./ Schad-Seifert, A./ Vogt, G. (Eds.) (2008): The Demographic Challenge. A Handbook about Japan. Leiden/Boston: Brill.

Fukawa, T. (2008): The Public Health-Care System – A Financial Perspective. In: Coulmas, F./ Conrad, H./ Schad-Seifert, A./ Vogt, G. (Eds.):The Demographic Challenge. A Handbook about Japan. Leiden/Boston: Brill, 1077-1095.

Ikegami, N./ Campbell J.C. (2007 [14th edition]): Nihon no iryō. Tokyo: Chūō Kōron Shin-sha.

Inoue, H. (forthcoming): Global Competition and the Hiring of Foreigners. In: Vogt, G./ Roberts, G. (Eds.) (forthcoming) Workers Without Borders in Japan and Germany (working title). JNA, Japan Nursing Association (2008): Statistical Data on Nursing Service in Japan. Tokyo: JNA.

JT, The Japan Times (2007/03/15): Foreign labor need exposes dearth of rights. http://search.japantimes.co.jp/cgi-bin/nn20070315f1.html

JT, The Japan Times (2008/03/26): Foreign trainees to get labor law safeguards. http://search.japantimes.co.jp/nn20080326a7.html.

JT, The Japan Times (2008/09/13): Centenarians expected to rise to record 36, 276. http://search.japantimes.co.jp/cgi-bin/nn20080913a2.html.

Kobayashi, A./ Sato, A. (2008/08/01): Male Indonesian nurses rejected. In: Daily Yomiuri. http://www.yomiuri.co.jp/dy/world/20080801TDY04303.htm.

Kohlbacher, F./ Herstatt, C. (Eds.) (2008): The Silver Market Phenomenon. Business Opportunities in an Era of Demographic Change. Heidelberg: Springer.

Kōno, T. (2006/02/20), Senior Vice Minister of Justice (2005/06), Member of the House of Representatives, Japan: personal interview at the Ministry of Justice, Tokyo.

Kōno, S. (2007): Jinkōgaku e no shōtai. Tokyo: Chūō Kōron Shin-sha.

Long, S. O. (Ed.) (2000): Caring for the Elderly in Japan and the US. London/New York: Routledge.

Long, S.O./ Campbell R./ Nishimura C. (2009): Does it Matter Who Cares? A Comparison of Daughters versus Daughters-in-Law in Japanese Elder Care. In: Social Science Japan Journal, Vol. 12, No. 1, 1-21.

Matsutani, A. (2006): Shrinking-Population Economics, Lessons from Japan. Tokyo: International House of Japan.

MHLW, Ministry of Health, Labour and Welfare (2006): Shūgyō hokenshi, josanshi, kangoshi, jukangoshisū, nenreikaikyū, nenjibetsu. http://www.mhlw.go.jp/toukei /saikin /hw /eisei/06/dl/data_0006.pdf.

MHLW, Ministry of Health, Labour and Welfare (2007): Kaigo hoken jigyō jōkyō hōkoku. http://www.mhlw.go.jp/topics/kaigo/osirase/jigyo/m07/0709.html.

MHLW, Ministry of Health, Labor and Welfare (2008): Dai 20 kai shakai fukushi-shi oyobi kaigo fukushi kokka shiken no gōkaku happyō ni tsuite. http://www.mhlw.go.jp /houdou/2008/03/h0331-4.html.

MOFA, Ministry of Foreign Affairs (2008): Joint Press Statement on the Occasion of the entry into force of the Agreement between Japan and the Republic of Indonesia for an Economic Partnership. http://www.mofa.go.jp/region/asia-paci/indonesia/joint080 7.html.

MOJ, Ministry of Justice (2007): Immigration Control 2007. http://www.moj.go.jp/ NYUKAN/nyukan68.html.

MOJ, Ministry of Justice (2008): Heisei 19 nenmatsu genzai ni okeru gaikokujin tōrokusha tōkei ni tsuite. http://www.moj.go.jp/PRESS/080601-2.pdf.

Nemezo, P. (2006/02/02): What's wrong with the JPEPA? In: Philippines Today. http://www.philippinestoday.net/index.php?module=article&view=73.

NIPSSR, National Institute for Population and Social Security Research (2006): Population Statistics of Japan 2006. http://www.ipss.go.jp/p-info/e/PSJ2006.pdf.

OECD, Organisation for Economic Co-Operation and Development (2007): International Migration Outlook. SOPEMI 2007 Edition. Paris: OECD Publications.

O'Neil, K. (2004): Labor Export as Government Policy: The Case of the Philippines. In: Migration Information Source. http://www.migrationinformation.org/Feature/display. cfm?ID=191.

Roth, J.H. (2002): Brokered Homeland, Japanese Brazilian Migrants in Japan. Ithaca/London: Cornell University Press.

SBSRTI, Statistics Bureau & Statistics Research and Training Institute (2007): Ratio of Unemployed in Labour Force and Active Job Openings-to-Applicants Ratio (Seasonally Adjusted). http://www.stat.go.jp/data/nenkan/pdf/z16-1.pdf.

Shinozaki, M. (2007): Opening the Door to Migrant Care Workers for the Elderly in Japan. What Can We Learn from the EU and East Asia? In: Asian Breeze 51, 5-6.

Tachibanaki, T. (2006): Amerikagata fuan shakai de ii no ka. Tokyo: Asahi Shinbunsha.

Torii, I. (2007/10/24): Unpublished manuscript presented at the international symposium on Migration and Integration, Japan in a Comparative Perspective, Tokyo.

Tsuda, T. (2003): Strangers in the Ethnic Homeland, Japanese Brazilian Return Migration in Transnational Perspective. New York: Columbia University Press.

UNPD, United Nations Population Division (2000): Replacement Migration: Is it a Solution to Declining and Ageing Populations? http://www.un.org/esa/population/ publications/migration/migration.htm.

Vogt, G. (2007): Closed Doors, Open Doors, Doors Wide Shut? Migration Politics in Japan. In: Japan aktuell. Journal of Current Japanese Affairs 5, 3-30.

Vogt, G. (2008): Talking Politics: Demographic Variables and Policy Measures in Japan. In: Kohlbacher, F./ Herstatt, C. (Eds.): The Silver Market Phenomenon. Business Opportunities in an Era of Demographic Change. Heidelberg: Springer, 17-29.

Vogt, G./ Roberts, G. (Eds.): Workers Without Borders in Japan and Germany (working title).forthcoming.

Yamada, M. (2007): Shōshi shakai Nihon. Tokyo: Iwanami Shoten.

Yamawaki, K./ YSIS, Yokohama Shiritsu Ichō Shōgakkō (2006): Tabunka kyōsei no gakkō-zukuri. Tokyo: Akashi Shoten.

Yashiro, N. (2008): The Silver Markets in Japan Through Regulatory Reform. In: Kohlbacher, F./ Herstatt, C. (Eds.): The Silver Market Phenomenon. Business Opportunities in an Era of Demographic Change. Heidelberg: Springer, 31-39.

The Authors

Federico Benassi:
University of Pisa, Department of Statistics and Mathematics Applied to Economics, Pisa, Italy.
Contact: benassi@ec.unipi.it.

Barry Edmonston:
University of Victoria, Department of Sociology, Victoria, Canada.
Contact: be@uvic.ca.

Michael Haan:
University of Alberta, Department of Sociology, Alberta, Canada.
Contact: michael.haan@ualberta.ca.

Martin Kohls:
Federal Office for Migration and Refugees, Nuremberg, Germany.
Contact: Martin.Kohls@bamf.bund.de.

Silvia Maja Melzer:
Institute for Employment Research (IAB), Nuremberg, Germany.
Contact: Silvia-Maja.Melzer@iab.de.

José Antonio Ortega:
United Nations, New York, USA
Contact: ortegaj@un.org.

Linda Porciani:
University of Pisa, Department of Statistics and Mathematics Applied to Economics, Pisa, Italy.
Contact: porciani@ec.unipi.it.

James Raymer:
School of Social Sciences, University of Southampton, Southampton, United Kingdom.
Contact: J.Raymer@soton.ac.uk.

Alberto del Rey Poveda:
Universitat Autònoma de Barcelona, Centre d'Estudis Demogràfics, Barcelona, Spain.
Contact: adelrey@usal.es.

Thomas Salzmann:
University of Rostock, Department of Sociology and Demography, Rostock, Germany.
Contact: thom.salzmann@uni-rostock.de.

Kirk Scott:
University of Lund, Centre for Economic Demography, Lund, Sweden.
Contact: Kirk.Scott@ekh.lu.se.

Susanne Schmid:
Federal Office for Migration and Refugees, Nuremberg, Germany.
Contact: Susanne.Schmid@bamf.bund.de.

Jenny Schmithals:
NEXUS, Institut für Kooperationsmanagement und interdisziplinäre Forschung, Berlin, Germany.
Contact: Schmithals@nexusinstitut.de.

Marina Shapira:
Edinburgh University, Centre for Educational Sociology, United Kingdom.
Contact: marina.shapira@ed.ac.uk.

Maria Stanfors:
University of Lund, Centre for Economic Demography, Lund, Sweden.
Contact: maria.stanfors@ekh.lu.se.

Gabriele Vogt:
University of Hamburg, Institute for Asian and African Studies, Hamburg, Germany.
Contact: gabriele.vogt@uni-hamburg.de.