The impact of EU enlargement on migration flows

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Acknowledgements

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Definitions

AC-10 are the Accession Countries that are expected to join the EU in 2004, i.e. Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia.

CEECs are the Central and Eastern European Countries amongst the AC-10, i.e. the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia.

CEEC-4 are the Czech Republic, Estonia, Hungary and Poland.

CEEC-10 are the CEECs plus those Central and Eastern European Countries that are expected to join the EU in 2007, i.e. the CEECs, plus Bulgaria and Romania.

EC-9 refers to the European Community members from 1973 to the end of 1980, i.e. Belgium, Denmark, France, Germany, Ireland, Italy, Luxembourg, The Netherlands and the United Kingdom.

EC-12 refers to the European Community (and then European Union since the entry into force of the Maastricht Treaty in 1993) from 1986 to the end of 1994, i.e. Belgium, Denmark, France, Greece, Germany, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain and the United Kingdom.

EU-15 refers to the current member states of the European Union, i.e. Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain, Sweden and the United Kingdom.

Executive Summary

This document is a report commissioned by the Home Office in order to assess the magnitude of potential migration flows to the UK after the enlargement of the European Union (EU). The countries which are expected to join the EU on 1 May 2004 are Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia. The aim of the report is to provide extensive information that will be helpful in evaluating the migration potential from these countries to the UK. This is done by (i) describing the socio-economic situation of the accession countries nowadays and since the early 1990s and comparing it to that of the UK and Germany, (ii) critically reviewing the existing literature that attempts to predict the effects of the current EU enlargement on migration flows, (iii) analysing the so-called Southern enlargement (the accessions of Greece, Portugal and Spain) and comparing it to the current one, and (iv) presenting a quantitative analysis of the effect of the current enlargement on migration to the UK.

Chapter 2 of the report briefly reviews the events that have led to the current situation in the enlargement process. Negotiations with the AC-10 were completed at the Copenhagen European Council in December 2002, when it was agreed that these countries could join the EU on 1 May 2004. These negotiations had considered how the AC-10 would adopt the EU's laws and rules, called the *acquis communautaire*. For the purpose of the negotiations the *acquis* was divided into chapters, one of which deals with *Freedom of Movement of Persons.* This chapter embodies the conditions under which individuals from the accession countries will be allowed into the current member states. In this respect, it has been agreed that after enlargement there will be no restrictions on movements of persons such as those for purposes of study or residence. However, a transition period regarding the free movement of workers, which will not apply to Malta and Cyprus, has been agreed with the rest of the accession countries. Its most important features are[1]:

1. Current member states are free to apply national measures restricting CEEC nationals from working in their territories for the first two years after accession.
2. After two years, member states must decide whether they wish to either grant free movement of workers, or continue to apply national measures for a further three year period.
3. After this period, restrictions can be prolonged for a maximum of two more years.
4. Current member states who permit free movement of workers for CEEC nationals are free to impose or re-impose restrictions in the first two years after accession. For five years after that date, a member state can ask the European Commission to suspend free movement of workers if it experiences or anticipates serious disturbances to its labour market.
5. A "standstill clause" ensures that rights to access the labour market of one of the current member states cannot be restricted further than those prevailing at the time of accession.

Chapter 3 begins by outlining the main drivers of the migration decision. It then describes the accession countries in terms of their economic and socio-economic characteristics from the beginning of the 1990s up to the present time. First, it describes the major economic and structural changes that have taken place in the CEECs since the beginning of their transition into market economies. The first years of this transition process were characterised by a severe recession, but this was followed by a period of economic growth, outperforming that in many Western European countries, including the UK and Germany.

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[1] See UK Foreign and Commonwealth Office Explanatory Notes on European Union (Accessions) Bill for further details.
http://www.parliament.the-stationery-office.co.uk/pa/cm200203/cmbills/098/en/03098x--.htm

In the second part of Chapter 3, socio-economic indicators from the accession countries in 2001 are compared to those in the UK and Germany. The accession countries and, specifically the CEECs, exhibit considerably lower per capita GDP and average wages. Inflation rates are above those in Germany and the UK. Unemployment rates are likewise higher than those in the UK and Germany, although comparable to those in Southern EU member states such as Spain. Relatively high investment rates indicate the potential for continued high growth rates in the future. The agricultural sector is very important as an employer in many accession countries but it is characterised by particularly low yields (output per unit of input) and productivity rates (output per worker), indicating that future reforms will release a considerable fraction of workers from this sector.

The demographic structure in the AC-10 countries is also considered. The differences in age structure across the CEECs, and between the CEECs and the UK and Germany is highlighted, and these numbers are related to recent historical developments.

Since fluency in the destination language is maybe the single most important component of human capital for immigrants, as it largely facilitates access to and success in the destination country's labour market, the foreign languages spoken by the CEEC population is assessed. A large part of the population of the Eastern enlargement countries is shown to have a communicative capacity in both English and German, which contributes to making English and German speaking countries among the EU-15, but also the US, potentially attractive destinations for emigrants.

Chapter 4 critically reviews the existing literature on potential migration flows following EU enlargement. The different studies reviewed can be divided according to the approach they follow. Some of them use historical data on migration to a particular destination to predict future immigration from the enlargement countries. Another group of studies is based on surveys carried out at household or individual level, where migration intentions are explored.

The first group of studies has attracted by far the most attention in the public debate about enlargement effects. However, the predictions in these studies are significantly qualified by the assumptions that are used. These assumptions are firstly discussed, along with how they may affect the predictions. Three of these studies[1], which make forecasts of migration flows from the CEECs to Germany and the EU, are then reviewed and their results compared for the years 2005 to 2015. The reported figures suggest that the total number of immigrants from the CEECs to the EU-15 countries in those ten years would be somewhere between 700,000 and 2,600,000, depending on the assumed rate of convergence of macroeconomic variables and the particular estimation model.

The results of studies based on surveys are reported next. The main problem with this approach is that predictions are based on reported intentions, and it is difficult to assess the degree to which intentions will be realised. The results of three surveys[2] which are reviewed all indicate that the migration potential after enlargement is rather limited.

Some 'back-of-the-envelope' calculations are made as a useful illustration of the potential magnitude of emigration according to these studies. These imply that the total number of permanent emigrants from the CEECs might be expected to be around 1.11 million, which is in the range of predictions of the econometric studies mentioned above (although the intention

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[1] Bauer and Zimmermann (1999), Boeri and Brücker (2000) and Fertig (2001).

[2] IOM (1998); survey undertaken by the Hungarian Academy of Science in November 2001, yet to be published; survey recently presented to an EU Working Group on enlargement.

surveys do not refer to a particular time period), and the number of temporary migrants to be about 2.22 million, which is at the upper bound of migration forecasts based on econometric models.

The surveys also allow micro-level characteristics of potential emigrants to be distinguished. According to the results of the IOM survey, those who have the highest propensity to migrate are young and highly-educated people, and their preferred countries of destination for labour migration in the EU are Germany, Austria, and the UK.

In Chapter 5, evidence from a historical EU enlargement is described: the so-called Southern enlargement of the 1980s, which comprised the accessions of Greece, Portugal and Spain. The percentage of the population of the three Southern enlargement countries relative to the then nine European Community (EC) members was similar to the percentage of the population of the CEECs to the current EU member states: around 20 per cent. However, there are important differences between the two cases[3]: first, the gap in terms of per capita GDP (in Purchasing Power Parity (PPP)) of the accession countries relative to the corresponding member states is much higher now (45.4 per cent) than it was at the time of the accession of the Southern countries (in 1981, average per capita GDP (in PPP) of Portugal, Spain and Greece amounted to 64.9 per cent of EC-average). Second, the status of the market economy is very different in this case, since the eight CEECs have undergone an arguably incomplete transition from socialist to market economies. Third, geographical distance is a more important factor in the current enlargement. Greece and Portugal did not have a common border with the EC-9, whilst the Spanish regions bordering France had at the time an income much above the national average. By contrast, half of the CEECs have a common border with Austria, Germany or Italy. Finally, there are major differences concerning the agricultural sector. Its relative importance is lower in the current case than it was for the Southern accession countries. However, average yields and productivity are much lower nowadays, which means that this sector will have to undergo important transformations that will most likely lead to an increase in unemployment.

According to the arguments given above, higher migration pressures should be expected when the Eastern enlargement takes place than those that accompanied the Southern enlargement. However, at the time of the latter predictions of large migration flows were also made. As a consequence, transition periods of six years (in the Greek case) and seven years (in the Portuguese and Spanish cases) were introduced, limiting free movement of labour. However, these fears never materialised, and the transition period for Spain and Portugal was eventually shortened to six years.

The scarcity of data does not allow precise analysis of the number of Greek immigrants to the EC during the corresponding transition period, which ended in 1987. The Eurostat data on migration from Greece, Portugal and Spain, only cover the period 1985-1997. According to these data, there was an increase of 102,000 Greeks in the other eleven EU countries which joined before 1995, in the ten years 1987-1997. This implies an annual average of about 10,000 immigrants. The data reveals that the stock of Spanish immigrants diminished during its transition period, and that in 1997, the last year for which figures are available, that stock had decreased even further. The figures for Portuguese immigration to the rest of the EU show an implied annual average of around 7,700 immigrants over the 11 year period, 1986-1997.

Whilst these figures are not exact, they do clearly suggest that the magnitude of immigration from the Southern accession countries was negligible, even after the end of the transition period, despite the existing differences between accession countries and member states in terms of unemployment rates, per capita incomes, etc. These differences are larger in the case of the CEECs compared to the current member states. But the previous experience seems to suggest that their role in determining migration flows is somewhat limited.

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[3] From European Commission (2001a).

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In Chapter 6, an analysis of migration potential from the AC-10 to the UK and Germany is carried out. As pointed out in Chapter 4, econometric forecasts of migration potential from the AC-10 are based on models estimated from historical data for, in this case, the UK and Germany. As there is hardly any historical migration from the AC-10 and, specifically, the CEECs to countries of the EU, forecasts need to assume that the AC-10 exhibit the same migration patterns, and react in the same way to economic variables, as past migration countries. Another important assumption is invariance over time, meaning that past trends can be projected into the future. Also, the data available for historic migrations is not as reliable as we would wish it to be, in particular for the UK, where it is based on survey information. Furthermore, historical migrations to both the UK and Germany were governed by regulations and particular programmes, which are not taken into account when doing the estimations. Therefore the predictions need to be evaluated with some caution.

The variable which the analysis seeks to explain is historical net immigration from various origin regions to the UK and Germany, relative to the population in the corresponding origin region. The base specification is a so-called variance-components model, and a second specification amends this model by adding the relative GDP of the origin country as an additional regressor. The results of the estimations are then used to predict future net migration from the AC-10 to the UK and Germany. It is pointed out that if migration rates from these countries differ substantially from historical migration rates, predictions based on these estimates may be misleading.

For the period up to 2010, estimates for Germany range between 20,000 and 210,000 net immigrants per year, depending on the underlying scenario. The last estimate assumes that all the CEECs are high emigration countries, and that there is slow convergence in GDP – within the model structure used, this is very likely to be an overestimate. Estimates for the UK range between 5,000 and 13,000 net immigrants per year. The low estimates for the UK are related to the low historical migration rates, which are discussed in the text. In the case that Germany restricts free movement of workers for a longer period than the UK, some of those immigrants to Germany may use the UK as a destination. However, even in the worst case scenario, migration to the UK as a result of Eastern enlargement of the EU is not likely to be overly large. The evidence brought together indicates that net migration from the AC-10 to the UK will be broadly in line with current migration movements. The chapter concludes by summarising the main limitations of the findings.

1   Introduction

This report has been commissioned by the Home Office. It provides information that may be helpful in assessing the effect of EU enlargement on migration to the UK. At present it is envisaged that Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia (called the AC-10 in what follows) will join the EU on 1st May 2004.

The report is structured in six chapters. Chapter 2 gives a brief overview of the political events that have led to the planned enlargement of the EU. It then describes the transitional measures that will apply to the movement of workers after accession.

Chapter 3 provides information about the accession countries. After explaining the important role which social and economic factors of the destination and origin countries play in the individual migration decision, it describes the AC-10 in terms of their current and past economic situation, and their demographic structure (and compares these numbers with the respective ones for the UK and Germany), as well as the knowledge of languages of their populations.

Chapter 4 critically reviews the literature that attempts to predict the effects of the current enlargement on migration flows. Two different approaches are distinguished. The first uses historical data on migration to a particular destination to predict future migration movements from the enlargement countries. Predictions from this literature have had an important impact on the public and policy debate. This literature is critically reviewed and the problems associated with the use of these methods for the purpose of predicting future migration are pointed out. The second approach uses interview-based data to compute future migration potential. Predictions about future migrations can be computed by aggregating up the weighted responses to questions on migration intentions. Projections of studies that use both approaches are presented.

The AC-10 enlargement is not the first enlargement of the EU embracing countries which are significantly weaker than the member states in economic terms. Similar fears about mass migration were expressed when the then EC expanded towards Southern Europe to include Greece and then Spain and Portugal as new member states. These past enlargements may contain important information for the consequences of future enlargements. Experiences from them are reviewed and discussed in Chapter 5.

Chapter 6 presents a quantitative analysis of the effect of the current enlargement on migration to the UK and Germany. The analysis is based on a parsimonious econometric model. This work is subject to the same criticisms as all the previous work that attempts to predict future migrations based on historical data. The possible shortcomings discussed in Chapter 4 are again pointed out. First, the data used for this analysis is described. The problems of the available data material, and how this may affect the empirical analysis, are highlighted. Then the empirical strategy that is used is described. Finally, future migrations to the main continental European recipient, Germany, and also to the UK are predicted. This work is the first quantitative study that analyses future migrations to the UK following enlargement – previous work is primarily concerned with Germany and Austria. Estimates for migration to the UK and Germany as a consequence of EU enlargement are computed for a variety of scenarios, using different model assumptions.

2 EU Eastern enlargement – an overview

This chapter briefly reviews the events that led to the forthcoming enlargement of the EU to the Central and Eastern European countries (from now on called the CEECs), Cyprus and Malta. The foundations for enlargement of the EU are laid out in Article 0 of the Treaty of Rome, which states that: *"Any European state which respects the principles set out in Article 6(1) may apply to become a member of the Union. It shall address its application to the Council, which shall act unanimously after consulting the Commission and after receiving the assent of the European Parliament, which shall act by an absolute majority of its component members. The conditions of admission and the adjustments to the Treaties on which the Union is founded which such admission entails shall be the subject of an agreement between the Member States and the applicant State. This agreement shall be submitted for ratification by all the contracting States in accordance with their respective constitutional requirements".*

Below is a chronology of the circumstances that led to the current state of negotiations for enlargement with the AC-10.

1988 Establishment of diplomatic relations: The Joint Declaration between the EC and the Council for Mutual Economic Assistance (Comecon)[4] on mutual recognition between the two parties opened the way for the EC and its member states to establish diplomatic relations with each of the Comecon states.

1989 Fall of the Berlin Wall on 9 November. The GDR opens its borders.
Financial support and reform: The Phare Programme is established. Its aim is to facilitate the political and economic transition of Poland and Hungary. It is subsequently extended to the other Central and Eastern European applicant countries. Phare will be identified in the future Europe Agreements as the financial instrument specifically aimed at helping achieve their objectives. By providing the funding to enable the partner countries to prepare for membership of the EU, Phare is fundamental to the process of integration.

1990 An agreement establishing the European Bank for Reconstruction and Development (EBRD), with the objective of providing financial support to Central and Eastern European countries, is signed.

1991 The EC and its member states sign the so-called "Europe Agreements" with Hungary and Poland. In the following years, Europe Agreements are signed with Bulgaria, the Czech Republic, Romania and Slovakia (1993), Estonia, Latvia, and Lithuania (1995) and Slovenia (1996). These Agreements provide the legal basis for bilateral relations between these countries and the EC. The most important issues covered are trade-related matters, political dialogue, legal approximation and other areas of cooperation, including industry, environment, transport and customs. Their aim is to progressively establish a free-trade area between the EU and the associated countries over a given period, on the basis of reciprocity but applied in an asymmetric manner (i.e. more rapid liberalisation on the EC side than on the side of the associated countries). Similar Association Agreements had already been established with Turkey (1963), Malta (1970) and Cyprus (1972).

1993 Copenhagen Summit: The European Council declares that "the associated countries of Central and Eastern Europe that so desire shall become members of the Union" as soon as they satisfy the requisite political and economic conditions. The Council also defined the EU-membership criteria ("Copenhagen Criteria"), which stated that, in order to qualify for EU membership, a candidate country must have achieved[5]:
- stability of institutions guaranteeing democracy, the rule of law, human rights and respect for and protection of minorities;
- the existence of a functioning market economy as well as the capacity to cope with competitive pressure and market forces within the Union;

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[4] The Comecon members were Bulgaria, Cuba, Czechoslovakia, the German Democratic Republic, Hungary, Mongolia, Poland, Romania, the Soviet Union and Vietnam.
[5] Source: European Commission, *Enlargement Website.* http://europa.eu.int/comm/enlargement

- the ability to take on the obligations of membership, including adherence to the aims of political, economic and monetary union.

1994 EU membership applications: Hungary and Poland formally apply to join the EU. The remaining CEEC-10 countries present their applications in 1995 (Bulgaria, Estonia, Latvia, Lithuania, Romania and Slovakia) and 1996 (Czech Republic and Slovenia). Turkey in 1987, and Cyprus and Malta in 1990 had already done so.

1997 Agenda 2000: The Commission presents the "Agenda 2000 – for a stronger and wider Europe" and its opinions on the applications of the AC-10, Bulgaria, Romania and Turkey. Agenda 2000 outlines the broad perspective for the development of the EU and its policies beyond the turn of the century. It addresses the challenge of enlargement, the reinforcement of the pre-accession strategy and the future financial framework in the context of an enlarged Union.

1998 First accession negotiations: Accession negotiations start with Cyprus, the Czech Republic, Estonia, Hungary, Poland and Slovenia. The negotiations determine the conditions under which each applicant country will join the EU. On joining the Union, applicants are expected to adopt the *acquis communautaire,* i.e. the detailed laws and rules formulated on the basis of the EU's founding treaties, mainly the treaties of Rome, Maastricht and Amsterdam. The negotiations focus on the terms under which the applicants will adopt, implement and enforce the *acquis* and, notably, the granting of possible transitional arrangements which must be limited in scope and duration.

1999 Expansion of accession negotiations: The European Council agrees in Helsinki to open accession negotiations with Bulgaria, Latvia, Lithuania, Malta, Romania and Slovakia. Turkey is conferred applicant country status.

2002 Accession recommendation: On 9 October the European Commission recommends to close negotiations with Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia. It considers that these countries are ready to join the EU in 2004. The Commission also states that it will do everything in its power to see that Bulgaria and Romania join the EU in 2007. No date is given for the beginning of accession talks with Turkey.

Current situation: free movement of persons

Accession negotiations between the 15 member states and the AC-10 concluded at the Copenhagen European Council in December 2002. The objective of the negotiations was to determine the conditions under which each applicant country would join the EU. That is, they focused on the terms under which the applicant countries would adopt, implement and enforce the *acquis communautaire*, and the granting of possible transitional arrangements, under which new member states would be able to phase in their compliance with certain laws and rules by a date agreed during the negotiations[6].

The different parts of the *acquis* that had to be agreed between the member states and the applicants were divided into chapters, and each of them has been negotiated separately between the two parties. The chapter that embodied the conditions under which individuals from the accession countries will be allowed into the current member states after enlargement was Chapter 2, dealing with *Freedom of Movement of Persons.* The agreements which have been reached on this issue are summarised below.

After enlargement, the general right to free movement between countries of the EU will remain open for all European citizens, and will not be affected by the transitional measures agreed for workers. There will be no restrictions on movement, for instance, for study or residence purposes. However, movement for purposes of work, as an employee, may potentially be restricted for up to seven years.

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[6] Source: European Commission. *Enlargement Website.* http://europa.eu.int/comm/enlargement

The application of transitional arrangements to workers in the years following an enlargement is not new. Transitional measures had also been applied at the accession of Greece in 1981 and Spain and Portugal in 1986. In the case of Greece, a transition period of six years was imposed. In the case of Spain and Portugal, a transition period of seven years was agreed upon, although this was eventually shortened to six years. In both cases, a general safeguard clause concerning serious and persistent economic problems in a sector or region was inserted in the accession treaties[7].

The transition period that has been envisaged for the current enlargement will not apply to Malta and Cyprus. For the other eight countries, it will work in the following way: during the first two years after accession, the current member states are free to admit workers from the future member states under national measures. Those that permit free movement of workers may impose or re-impose restrictions during this time. Following this two year period, the Commission will report on the situation and member states will decide whether they want to either grant free movement of workers, or continue to apply national measures. During the next three years a current member state that has permitted free movement of workers can ask the Commission to suspend this law if it can show serious disturbances in its labour market, or a threat of such disturbances. However, at the end of that time (five years after accession) the transition period is expected to come to an end in those countries which are still applying restrictions. In exceptional circumstances, again relating to showing an actual or threat of a serious disturbance in its labour market, member states will be able to ask the Commission to prolong it for a further two years. Seven years after accession, no member state will be allowed to restrict free movement of workers from the CEECs.

The transition agreement also includes a so called "standstill clause" whereby rights to access the labour market of one of the current member states cannot be restricted further than those prevailing at the time of the accession. Moreover, there will also be a "preference rule", stating that workers from new member states must be given priority over people from non-EU countries during the transition period.

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[7] Source: European Commission (2001c)

3   The enlargement countries

In this chapter the migration decision and the way in which it relates to different economic and social factors is initially considered. The socio-economic factors characterising the AC-10 which could influence the decision of citizens of these countries considering the possibility of migration after enlargement are then described.

Next, an account is given of the major economic and structural changes the CEECs have undergone over the last twelve years. Since there is a large specialised literature that describes this transformation process[8], only a brief overview is given.

Some background information on recent economic and demographic developments in the CEECs, Cyprus and Malta is also provided. The considerable differences in economic indicators between the accession countries and Germany and the UK, on the one hand, as well as among the AC-10 themselves are highlighted. Indicators of the current situation in Cyprus and Malta are provided, but far less attention is given to these two countries, due to both the relatively low importance of these economies in terms of population and GDP compared to the rest of the accession countries, and also their higher level of economic development. Purchasing Power Parity (PPP) GDP per capita (pc) in Cyprus (20,824 current international dollars) and Malta (17,273) is above 70 per cent of the EU average (23,654)[9], suggesting that their role as potential sending countries of economic migrants should be minimal.

The migration decision

Most modern studies of migration decisions are based on the hypothesis formulated by Hicks stating that "differences in net economic advantages, chiefly differences in wages, are the main causes of migration" (Hicks, 1932). According to Hicks, and in the absence of further institutional or legal barriers, the prime determinant of the decision to migrate is the difference in wages (as well as other sources of income) between the receiving and the sending countries, net of migration costs.

Later studies of Sjaastad (1962) and Harris and Todaro (1970) relate the migration decision to differences in returns to human capital and to costs of migration. In order to link the effect of the labour market differentials mentioned by Hicks to the migration decision, Sjaastad proposes to view this decision as a problem of "resource allocation". To do this, migration must be treated "as an *investment increasing the productivity of human resources,* an investment which has costs and which also renders returns" (Sjaastad, 1962).

The stock of an individual's human capital can be affected by his or her decision to migrate. A person will choose to migrate when the increase to the discounted expected future earnings (i.e. the returns to the investment in human capital) is higher than the costs. Migration costs involve direct costs (e.g. the transportation costs for migrants and their belongings), forgone earnings (e.g. earnings forgone while looking for a new job in the destination country) and psychological costs (e.g. those associated with leaving friends and family behind).

It is easy to see that social and economic factors characterising both the sending and the receiving countries, as well as characteristics of the potential migrant population, are associated with the returns and costs of migration outlined above. Economic factors such as unemployment

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[8] See Cox and Mason (1999); Pradeep (2002); Weise, Bachtler, Downes, McMaster and Toepel (2001).
[9] Data on PPP GDP pc from The World Bank (2002). Purchasing power parity (PPP) GDP is gross domestic product converted to international dollars using PPP rates. An international dollar has the same purchasing power over GDP as the US dollar has in the US.

rates and wages both in the sending and the receiving country are taken into account by individuals when comparing their expected future earnings (computed as the wage multiplied by the probability of being employed) in the destination country with those they would obtain if they decided to stay. Socio-economic characteristics of individuals from the sending country, like age and education, have an influence on the migration decision by affecting stock and future accumulation potential of human capital, as well as opportunity costs and psychological costs.

To characterise the migration potential from the enlargement countries to the EU-15, the current socio-economic situation of the enlargement countries will be briefly described. This characterisation also facilitates the comparison of the current enlargement with the Southern enlargement, which is analysed in Chapter 5.

A brief history

During the decade of the 1990s and up to the present day, the Central and Eastern European countries have gone through a process of intense social and economic transformation which has been accompanied by progressive political and economic integration with the EU.

The EU has welcomed and facilitated the changes, through the provision of both financial support to these countries (establishing the Phare programme and the European Bank for Reconstruction and Development) and of an adequate institutional framework for this transition to develop (signing the Europe Agreements).

The Copenhagen European Council in June 1993 established the economic and political conditions - known as "Copenhagen Criteria" - which a prospective member should fulfil in order to be prepared to join the EU. Since then, the performance of these countries has been closely followed by the Commission. In 1997, the *Opinions* evaluated the compliance with the economic criteria for accession. These were followed by the *Regular Reports*[10] on economic criteria and the ability of the candidate countries to fulfil the obligations arising from accession. The main social and economic changes that took place during the transition process are described below.

After the fall of the Berlin Wall, the Central and Eastern European countries experienced a severe recession, which lasted from 1990/1 until 1993. These years were characterised by a heavy decline in GDP, which was a consequence of the restructuring and transition process from formerly planned economies into market economies. In addition, there was an almost complete breakdown of trade relations with the countries of the former USSR, and many CEECs re-orientated these relations to the EU. The transition process exposed these countries' economies to new relative price structures, since these were no longer set by the central governments. At the same time, they witnessed a rapid disintegration of the old management and production structures, with a large part of existing industrial equipment becoming obsolete and unemployment soaring.

From 1990 to 1993 all the CEECs introduced stabilisation programmes which included measures such as the application of tighter fiscal and monetary policies and wage controls. In addition, important structural reforms took place, including the liberalisation of domestic prices, foreign trade and capital movements; privatisation and restructuring of state-owned enterprises; and the creation of new governmental institutions and the development of the legal framework needed to support and supervise these changes.

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[10] Both the Commission's *Opinion* on each Application for Membership of the EU and the *Regular Reports* can be accessed, through the European Commission's Enlargement Website:
http://europa.eu.int/comm/enlargement/candidate.htm

In Figure 3.1, we compare PPP GDP per capita (pc) between Germany, the UK and the accession countries in the year 2000. The graph shows that PPP GDP pc in the CEECs, relative to Germany or the UK, is quite low. However, this PPP GDP has increased significantly over the last decade. Table 3.1 gives figures on the levels and annual growth rates of PPP GDP pc in the accession countries from 1989 to 2001. Early in the last decade, during the years of severe recession, growth rates in most of the CEECs were negative. After the introduction of stabilisation measures, growth rates became positive, and for many countries exceeded those of the UK and Germany during the second half of the 1990s.

Figure 3.1.   PPP GDP per capita in the CEECs, Cyprus and Malta relative to the UK and Germany. Year 2000. Percentages.
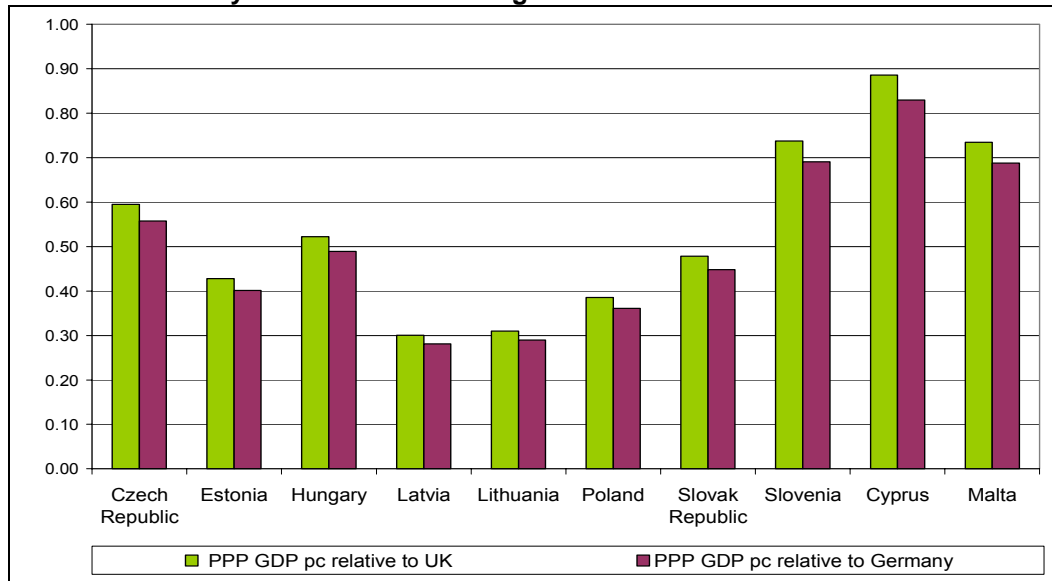
Source: World Development Indicators Database. The World Bank (2002).
Units: Current international dollars.
Definition: Purchasing Power Parity (PPP) GDP per capita is gross domestic product per capita converted to international dollars using PPP rates. An international dollar has the same purchasing power over GDP as the US dollar has in the US.

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Table 3.1. PPP GDP per capita in levels (bold figures) and annual growth rates. Years 1989-2001.

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Cyprus	**12,007**	**12,783**	**12,950**	**14,478**	**14,577**	**15,587**	**16,939**	**17,384**	**17,560**	**18,232**	**19,393**	**20,824**	**n.a.**
		6.46	1.30	11.80	0.68	6.93	8.68	2.63	1.01	3.83	6.37	7.38	
Malta	**8,409**	**8,742**	**9,561**	**10,420**	**11,077**	**12,028**	**13,150**	**13,857**	**14,354**	**15,014**	**15,385**	**17,272**	**n.a.**
		3.96	9.37	8.97	6.31	8.59	9.33	5.37	3.59	4.59	2.47	12.27	
Czech Republic	**n.a.**	**n.a.**	**n.a.**	**10,801**	**11,023**	**11,433**	**12,530**	**13,364**	**13,265**	**13,044**	**13,258**	**13,991**	**14,885**
					2.06	3.72	9.60	6.66	-0.74	-1.67	1.65	5.53	6.39
Estonia	**8,516**	**7,957**	**7,529**	**6,320**	**5,977**	**60,62**	**6,542**	**6,988**	**8,087**	**8,389**	**8,631**	**10,066**	**10,380**
		-6.57	-5.37	-16.05	-5.43	1.43	7.91	6.81	15.73	3.73	2.89	16.62	3.13
Hungary	**9,804**	**9,517**	**8,579**	**8,578**	**8,665**	**9,124**	**9,638**	**9,803**	**10,221**	**10,745**	**11,394**	**12,279**	**12,941**
		-2.93	-9.85	-0.01	1.01	5.31	5.63	1.71	4.25	5.12	6.04	7.78	5.39
Latvia	**8,496**	**8,487**	**7,817**	**5,335**	**4,693**	**4,885**	**5,057**	**5,312**	**5,793**	**6,023**	**6,428**	**7,062**	**7,750**
		-0.11	-7.90	-31.76	-12.02	4.10	3.51	5.05	9.04	3.98	6.72	9.86	9.73
Lithuania	**n.a.**	**8,349**	**8,060**	**6,588**	**5,627**	**5,209**	**5,618**	**6,045**	**6,570**	**6,920**	**6,850**	**7,278**	**7,764**
			-3.46	-18.26	-14.59	-7.43	7.87	7.59	8.70	5.32	-1.00	6.25	6.67
Poland	**n.a.**	**5,684**	**5,291**	**5,512**	**5,781**	**6,217**	**6,824**	**7,239**	**7,703**	**8,001**	**8,512**	**9,051**	**9,327**
			-6.91	4.17	4.88	7.54	9.77	6.08	6.40	3.87	6.39	6.34	3.04
Slovakia	**9,253**	**9,028**	**7,937**	**7,644**	**7,466**	**7,983**	**8,703**	**9,336**	**9,902**	**10,225**	**10,732**	**11,243**	**11,739**
		-2.43	-12.08	-3.70	-2.32	6.91	9.03	7.27	6.06	3.27	4.96	4.77	4.40
Slovenia	**n.a.**	**n.a.**	**11,345**	**11,145**	**11,798**	**12,312**	**13,253**	**13,888**	**14,586**	**15,055**	**16,216**	**17,333**	**18,233**
				-1.76	5.86	4.36	7.65	4.79	5.03	3.21	7.71	6.89	5.19
Germany	**17,730**	**18,223**	**19,111**	**20,133**	**20,147**	**21,073**	**22,123**	**22,429**	**22,636**	**22,966**	**23,871**	**25,103**	**25,715**
		2.78	4.87	5.35	0.07	4.59	4.98	1.38	0.92	1.46	3.94	5.16	2.44
UK	**16,512**	**16,706**	**16,789**	**17,263**	**17,964**	**18,780**	**19,965**	**20,534**	**21,006**	**21,255**	**22,273**	**23,509**	**24,421**
		1.17	0.50	2.82	4.05	4.54	6.31	2.85	2.30	1.19	4.79	5.55	3.88

Source: World Development Indicators Database. The World Bank (2002).
Units: Data on PPP per capita GDP are in current international dollars. Annual growth rates are percentages.
Definition: Purchasing power parity (PPP) GDP is gross domestic product converted to international dollars using PPP rates. An international dollar has the same purchasing power over GDP as the US dollar has in the US.
Notes: n.a. indicates that the corresponding information is not available.

The change in the trend of GDP growth rates is illustrated in Table 3.2, which shows average annual GDP growth rates for the AC-10, Germany and the UK for the periods 1991-1993 and 1994-2001. The figures indicate the seriousness of the crisis for most of the CEECs, but also show that there was considerable variation across countries: Poland's growth rate was more or less stagnant during the period 1991-1993, while GDP in Estonia, Latvia and Lithuania dropped by an annual 12.51, 20.05 and 14.39 per cent respectively. It is evident that the economic crisis was more acute in those countries that had the closest links with the former Soviet Union, especially the Baltic states. Recovery in the Baltic states was also slow, with GDP levels in Lithuania and Latvia in 2001 still below those in 1989 (see Table 3.1).

Nevertheless, growth rates from 1994 onwards for most CEECs by far outperformed those of Germany and the UK. Poland, the most populous of the enlargement countries, was the least affected by the early 1990's crisis, and its yearly average GDP growth rate after 1994 was 4.9 per cent, the highest among the enlargement countries and more than double the size of Germany's.

Table 3.2. Average annual GDP growth rates. Percentages.

	1991-1993	**1994-2001**
Cyprus	3.59	4.38
Malta	5.15	4.71
Czech Republic	-4.02	2.07
Estonia	-12.51	3.88
Hungary	-5.18	3.54
Latvia	-20.05	3.89
Lithuania	-14.39	1.80
Poland	-0.20	4.89
Slovakia	-8.33	4.44
Slovenia	-3.83	4.26
Germany	1.33	1.67
UK	0.31	2.93

Source: Averages calculated from annual GDP growth rate figures from the World Development Indicators Database. The World Bank (2002).
Definition: Figures represent annual percentage growth rate of GDP at market prices based on constant local currency.

An important part of the transformation process in the CEECs was the reform of their labour markets, characterised by a movement towards liberalisation, increased private sector employment and the introduction of new systems of labour negotiations[11]. The labour market transition led in all the Central and Eastern European countries to a rise in unemployment, although its magnitude and timing varied depending on the nature of the reforms undergone in each country. The development of unemployment rates in the CEECs is illustrated in Figures 3.2 and 3.3. The figures show that all countries have higher unemployment rates in 2000 than they had at the beginning of the 1990s. According to the figures in Table 3.3, these unemployment rates are generally higher than those in Germany and the UK. However, they are not that different from those in other European countries like, for example, Spain (14.1% in 2000)[12]. Some countries (Lithuania, Latvia, Slovenia and Hungary) show a clear downward trend in unemployment rates since the early-mid 1990s, but in some others (Slovakia, Poland and Estonia) the increase in unemployment in recent years has been substantial.

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[11] See Weise, Bachtler, Downes and Toepel (2001); Bilsen and Konings (1998) and OECD (1995).
[12] Source: World Development Indicators Database. The World Bank (2002).

Figure 3.2. Unemployment rates in the Czech Republic, Hungary, Poland, Slovakia and Slovenia, 1990-2000.
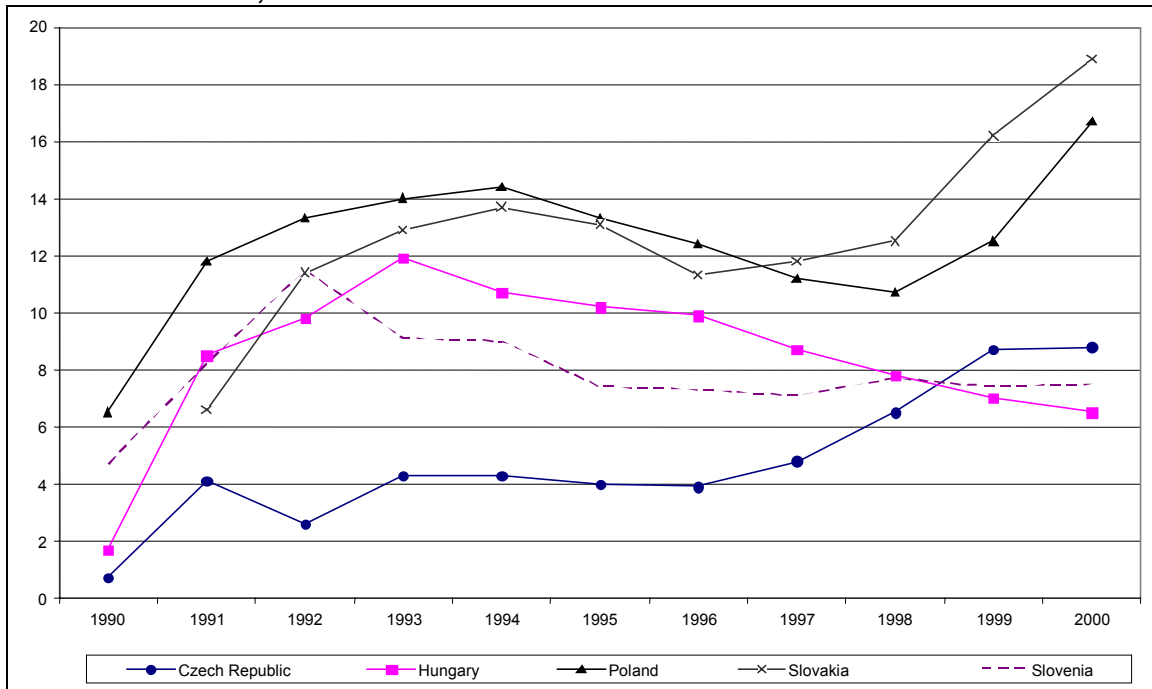
Source: World Development Indicators Database. The World Bank (2002).
Definition: Unemployment is total unemployment as a percentage of total labour force.

Figure 3.3. Unemployment rates in Estonia, Latvia and Lithuania, 1990-2000.
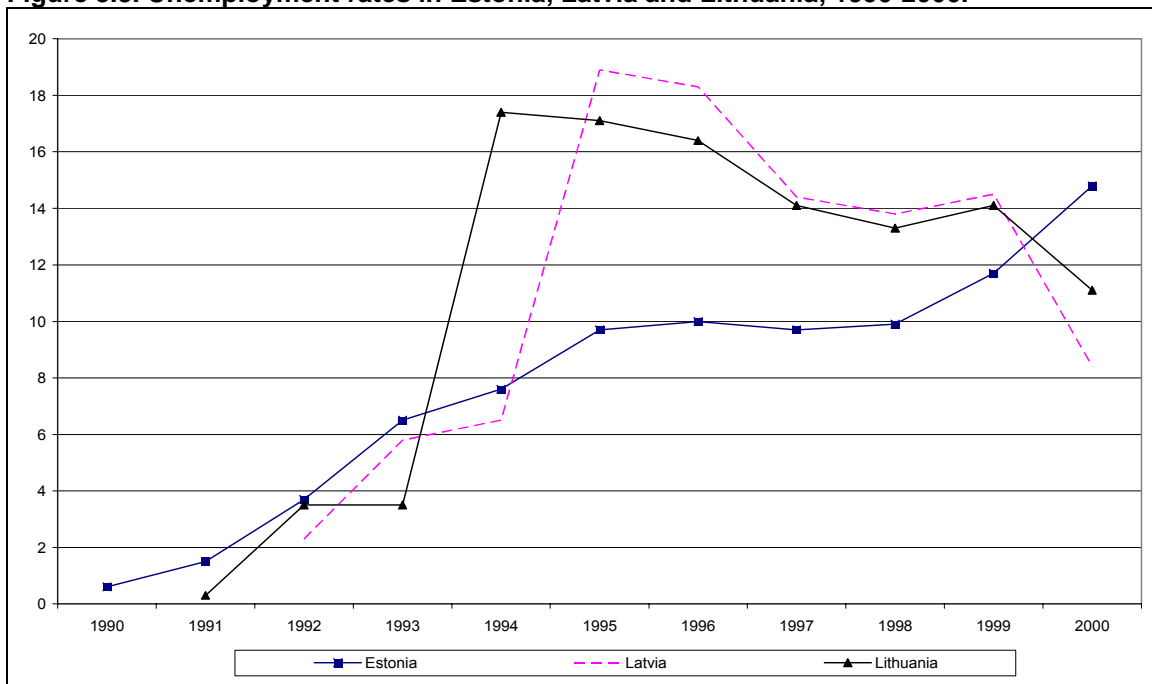
Source: World Development Indicators Database. The World Bank (2002).
Definition: Unemployment is total unemployment as a percentage of total labour force.

The trade relationships of the CEECs also suffered a drastic reorientation during the 1990s, from the former USSR states towards the EU. According to Eurostat statistics, more than 60 per cent of the trade of the CEECs in 2000 was with the EU. Similarly, the candidate countries' share in the EU's trade flows was 14 per cent in 2000, which means that they were the EU's second biggest trade partner after the US[13].

The structure of trade observed during the 1990s reflects a strong increase in intra-industry trade. That means that the EU and the CEECs exchange products belonging to the same commodity groups, although the EU specialises in the production of those with high unit values, and the CEECs in the lower price and quality segments of markets. This implies a difference in endowments, with the EU producing high technology- and skill-demanding goods, and the CEECs more labour- and less skill-intensive ones[14].

Current situation

Table 3.3 shows the values of several key economic indicators for the AC-10, Germany and the UK in the year 2000 (unless indicated otherwise). The first column reports the population of each country, which is useful when assessing their relative importance among the AC-10. These population figures are used as weights in the computation of the CEEC averages in the rest of the columns. The total population of the AC-10 in 2000 was 74,916,250, that is, 19.9 per cent of the EU-15 population (376,399,540)[15].

Column 2 gives PPP GDP figures as a percentage of the EU average. Both Germany and the UK are very close to the average, while the figure for some of the CEECs is less than 40 per cent of the EU average. Estonia, Latvia, Lithuania, Poland and Slovakia are characterised by particularly low numbers. In the case of the Baltic states, those are a consequence of the seriousness with which they were affected by the crisis of the early 1990s. It is clear that despite the high growth rates displayed by the CEECs in recent years (see Table 3.1), many of these countries are still far from converging with the current EU member states.

On the other hand, PPP GDP figures for Slovenia, Cyprus and Malta relative to the EU average (73%, 84% and 73% respectively) are quite high. None of these countries reaches the EU average, but they are comparable to less developed EU member states, like Greece and Portugal (whose PPP GDP pc are 70% and 73% of the EU average, respectively[16]).

The next column shows hourly direct labour costs in industry and services in euros. The indicator we initially intended to show in this column was hourly wages. However, information on wages in the AC-10 is not readily available, and existing measures vary widely across sources. The Eurostat data presented in 2000 shows for the first time harmonised figures on labour costs for the AC-10 (except for Malta). This information is directly comparable to that provided by Eurostat on labour costs in the member states. Because these figures were more reliable than those about wages, it was therefore decided to include these instead. Specifically, direct labour costs account for direct remuneration to employees, payments to employees saving schemes, payments for days not worked and benefits in kind. Indirect costs (i.e. social security expenses that must be paid by the employer, expenditures on vocational training, taxes, etc.) are excluded.

The figures show that direct labour costs (as a proxy for wages) are much lower in the CEECs than in Germany or the UK. Direct labour costs in Germany are more than ten times higher than in Latvia or Lithuania, and direct costs in the UK are more than eight times higher. Even in Slovenia, direct labour cost is less than half of that in the UK and Germany. These large

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[13] Source: Eurostat (2001). Figures refer to the AC-10 plus Romania, Bulgaria and Turkey.
[14] See Weise, Bachtler, Downes and Toepel (2001).
[15] Source: World Development Indicators Database. The World Bank (2002).
[16] Source: World Development Indicators Database. The World Bank (2002).

differences suggest similar differences in wage rates, which could be a major incentive for individuals to look for jobs in one of the EU member states.

According to column 4, unemployment rates in the CEECs are high, and reach double figures in Estonia, Lithuania, Poland and Slovakia. The CEECs' average unemployment rate is not far from those of certain member states (e.g. Spain), as was mentioned before, but only in a few countries are unemployment rates clearly declining (note that these observations are based on data up to 2000.)

Column 5 shows figures on inflation rates in the AC-10. These are higher than in Germany and the UK, especially in the case of the CEECs. However, inflation rates in the CEECs during the 1990s were much higher, reaching three-figure numbers in some countries. Therefore, data in column 5, despite being higher than those in the EU, suggest that most of the CEECs have been able to stabilise inflation.

The last column shows data on investment rates. According to the World Development Indicators Database's[17] definition, the indicator in column 6 includes land improvements (fences, ditches, drains and so on); plant, machinery and equipment purchases; the construction of roads, railways, schools, offices, hospitals, private and residential dwellings and commercial and industrial buildings; and acquisition of valuables. Investment is an important determinant of long-run economic growth. The higher the difference in investment rates between the AC-10 and, specifically, the CEECs and Germany and the UK, the higher the speed at which the catching-up process will take place. According to the data in column 6, investment rates seem to be generally higher than those in Germany and the UK, although the differences are not enormous.

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[17] Source: World Development Indicators Database. The World Bank (2002).

Table 3.3. Socio-economic indicators. Year 2000.

	Population[1]	PPP GDP per capita as a percentage of EU average [2,3]	Hourly Direct Labour Cost [4,5]	Unemployment Rate [6,1]	Consumer Price Index [7,3]	Investment-to-GDP Ratio [8,1]
Czech Republic	10,273,300	59.15	2.81	8.8	3.90	28.31
Estonia	1,369,000	42.55	2.21	14.8	4.03	25.58
Hungary	10,208,960	51.91	2.57	6.5	9.78	24.56
Latvia	2,372,000	29.86	1.87	8.4	2.65	24.54
Lithuania	3,506,200	30.77	1.95	11.1	1.01	18.65
Poland	38,650,000	38.27	3.41	16.7	10.13	25.36
Slovakia	5,401,790	47.53	2.21	18.9	12.04	29.97
Slovenia	1,988,000	73.28	7.31	7.5	10.85	27.15
Average CEECs		44.14	3.08	13.53	8.59	25.70
Cyprus	757,000	84.04	9.10	3.3[9]	4.14	18.24[10]
Malta	390,000	73.02	n.a.	5.3[10]	2.37	26.42
Germany	82,150,000	106.13	20.02	8.1	1.95	21.39
UK	59,738,900	99.38	16.82	5.3	2.93	17.77

Notes:

n.a. indicates that the corresponding information is not available.

[1] Source: World Development Indicators Database. The World Bank (2002).

[2] GDP per capita in PPP as a percentage of the EU average.

[3] Calculations made using data from the World Development Indicators Database. The World Bank (2002).

[4] Direct hourly labour cost in industry and services. Units: Euros.

[5] Source: Eurostat (2001b) and Eurostat (2002).

[6] Unemployment rate as a percentage of labour force.

Table 3.4 shows indicators for the agricultural sector and describes the sectoral composition of GDP in the AC-10, Germany and the UK. The agricultural share in GDP of the CEECs tends to be much higher that that of Germany and the UK, whereas the share corresponding to services is generally lower. On the other hand, the share of the labour force working in the agricultural sector is extremely high in the CEECs, reaching a value of 18.8 per cent in Poland, the most populous of the CEECs.

The most important point from Table 3.4 is the very low productivity of the agricultural sector in all the CEECs except Slovenia. Two measures of productivity are given: column 3 (yields) shows the value added per unit of input. Figures in this column correspond to the year 1994, so they are not very useful for evaluating the current situation. However, we can see that at that moment, excluding Slovenia, productivity per input was not higher than 30 per cent[18] of that of Germany in any of the CEECs, and for some countries it was as low as 14 (Lithuania), 15 (Latvia) or 16 (Estonia) per cent. Figures for the second measure of productivity (value added per worker, in column 2) correspond to the year 1999, and still reveal huge productivity differences between the CEECs and the UK and Germany. Productivity per worker in Poland is the lowest of all the CEECs: only 5 per cent of that of the UK, and 6 per cent of that of Germany.

One of the reasons behind the low productivity-per-worker figures may well be the existence of hidden unemployment in many of the agricultural regions of the CEECs. Also, the low productivity values imply that most of these regions will have to undergo an important re-structuring process. As has been indicated in one of the European Commission's Enlargement Papers[19], this is the case for many small-scale family farms characterised by the already mentioned hidden unemployment, low skills, difficult access to inputs and inefficient scales in imperfect market conditions. The restructuring process of these areas in countries like Poland, where the overall importance of the agricultural sector is still very high, could lead in the medium-run to a worsening of the relative position of the accession countries with respect to the EU member states, with a marked increase in unemployment rates, and an increase in migration potential.

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[18] 30 per cent figure corresponds to Hungary.
[19] European Commission (2001a).

Table 3.4. Agricultural sector indicators and GDP composition. Year 2000.

	Labour force in agriculture[1]	Value added per worker[2,3]	Yields[5,6]	GDP – composition by sector[7]		
				Agriculture	Industry	Services
Czech Republic	5.1	5,921	n.a.	4.07	41.38	54.55
Estonia	7.4	3,732	226.03	5.99	26.68	67.32
Hungary	6.4	5,127	421.50	4.8[8]	32.4[8]	62.8[8]
Latvia	13.5	2,458	215.29	4.48	25.27	70.25
Lithuania	18.0	2,992	190.83	7.62	32.94	59.44
Poland	18.8	1,886	366.01	3.82	36.22	59.96
Slovakia	6.7	3,491[4]	387.13	4.06	31.04	64.90
Slovenia	9.9	33,219	921.85	3.32	38.29	58.39
Cyprus	9.2	n.a.	n.a.	3.8	19.9	76.3
Malta	1.9	n.a.	n.a.	2.3	29.2	68.5
Germany	2.8[8]	30,608	1,410.85	1.22	31.18	67.60
UK	1.5[8]	35,469	n.a.	1.04	28.80	70.16

Sources: World Development Indicators Database. The World Bank (2002). European Commission (2002d).
Notes:
n.a. indicates that the corresponding information is not available.
[1] Definition: proportion of total employment working in the agricultural sector.
  Units: percentages.
[2] Definition: agriculture value added per worker.
  Units: constant 1995 US dollars.
[3] Except when otherwise indicated, figures correspond to year 1999.
[4] Figure corresponds to year 1997.
[5] Definition: agriculture value added per hectare of agricultural land.
  Units: constant 1995 US dollars.
[6] Figures correspond to year 1994.
[7] Definition: value added in each sector as a percentage of GDP.
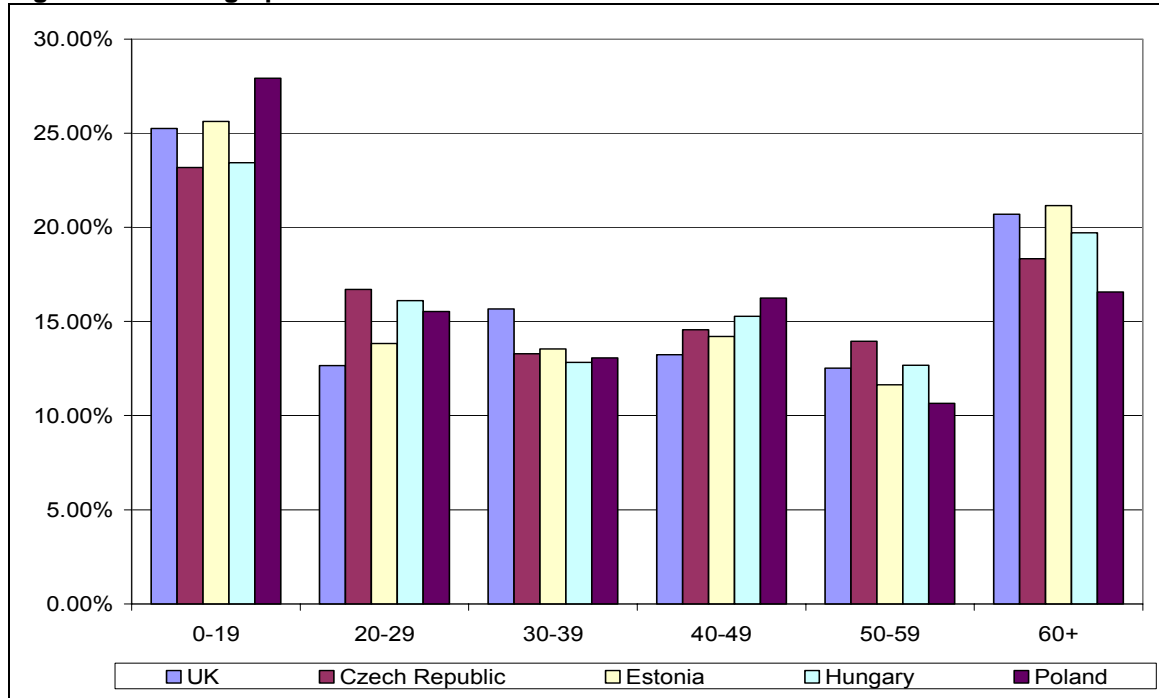 Units: percentages.
[8] Figure corresponds to year 1999.

Demographic structure and education

The AC-10 countries are quite heterogeneous in their demographic characteristics. They also exhibit differences in comparison to Germany and the UK. Most importantly, post-World War II (WWII) population dynamics as well as WWII itself have left their imprint on the population age structure of these countries (see e.g. Schmidt (1996) for the cases of some of the CEECs). Whereas Germany experienced a decade of high birth rates in the late 1950s and early 1960s, most of the AC-10 experienced such a baby-boom directly after the end of WWII.

For the year 2000, Figure 3.4 documents a relatively high proportion of people in the age group 20-29 in the AC-10 countries depicted relative to the UK. The proportion of people in the age group 0-19, on the other hand, is similar in the four AC-10 countries (except, perhaps, Poland) and the UK. This can be understood by taking into account that, whereas mortality rates remained relatively stable during the 1990s (see United Nations, 1996), there was a remarkable decline in birth rates at the beginning of the 1990s for almost all the AC-10.

Figure 3.4. Demographic structure in the UK and selected CEECs. Year 2000.

Source: United Nations (2002).
Definition: Each category represents percentage of total population in the corresponding age group.

Individuals from these two cohorts (0-19 and 20-29) will be the prime candidates to migrate to the current EU member states after enlargement. The decline in birth rates which has caused the percentage of people in the youngest cohort to decrease will thereby moderate future migration pressure.

An important indicator of migration potential is the ability of individuals from sending countries to speak the language of the targeted receiving country. It can be seen in Table 3.5 that a high fraction of the population in the accession countries speaks foreign languages. In Slovenia and Hungary, English is the foreign language spoken by the largest fraction of the population. Russian is widely spoken in the Baltic states and in the Czech Republic, Poland and Slovakia. German is

spoken by at least 10 per cent of the population in all the CEECs. In the Czech Republic, which has a common border with Germany, it is already more widely spoken than Russian.

Table 3.5. Languages spoken apart from mother tongue [1]. Percentages.

	English	German	Russian	French	Spanish	Italian
Czech Republic	24	27	21	3	1	1
Estonia	29	13	53	1	0	1
Hungary	14	13	2	2	0	1
Latvia	23	14	59	1	0	0
Lithuania	20	13	83	2	0	0
Poland	21	16	28	3	1	1
Slovakia	13	20	30	2	1	0
Slovenia	46	38	2	4	1	14
Cyprus	57	2	1	6	1	1
Malta	84	2	0	9	1	49

Source: European Commission (2002a).
[1] Responses to the question "Which languages can you speak well enough to take part in a conversation, apart from your mother tongue?"

The shift towards Western European languages is most evident when looking at the languages studied at secondary school (Table 3.6). Overall, English is studied by the highest percentage of students in the accession countries, followed by German. There are surprising patterns in the study of Russian as a foreign language: while Russian is important in countries that share large common borders with Russia (in particular the Baltic states), it is nearly insignificant as a foreign language in other countries like Hungary and the Czech Republic. The relatively low rank of French as a foreign language is also interesting.

Table 3.6. Percentage of pupils in general secondary education (ISCED 2+3) by foreign language studied. Year 1999/2000.

	English	**German**	**Russian**	**French**	**Spanish**
Czech Republic	63.7	49	0.5	3.7	0.7
Estonia	86.4	35.6	53.9	2.7	0.2
Hungary[2]	63.4	59.6	1.1	3.7	0.4
Latvia	87.7	32.8	39.2	1.8	0.2
Lithuania	73.1	34.1	58.6	7.1	0.0
Poland	80.4	52.9	18.1	10.9	0.3
Slovakia	56.0	51.2	6.8	3.5	0.4
Slovenia[4]	84.8	29.6	0.0	2.0	0.2
Cyprus[1]	100.0	-	-	100.0	-
Malta[3]	-	7.3	0.2	41.1	2.1

Source: European Commission (2002d).
Notes:
[1] Special and evening classes excluded.
[2] Includes ISCED 1 pupils and refers to full-time only.
[3] English is Malta's second official language. All students (ISCED 1 to 3) have to study the language.
[4] 1998/1999 data.

Fluency in the destination language, as is mentioned above, is perhaps the single most important component of human capital for immigrants, as it largely facilitates access to and success in the destination country's labour market. It is crucial for communication, gathering of information, development of productive skills and labour market assimilation. The large proportion of the CEECs' populations who have a knowledge of English and German, as well as the increasing trend in these numbers, contribute to making English and German speaking countries among the EU-15, but also the US, attractive destinations for potential emigrants.

If language choice of secondary school pupils can be understood as an investment in future productivity, then the ranking of languages is quite indicative of the importance attached to particular countries or economies. English, as the "world language", is considered very important in all these countries, indicating a high weight attached to being able to communicate with a large international community. Russian is still considered important in those countries that have long borders with Russia, but insignificant for countries that are strongly oriented towards Austria and Germany, in which German is most popular. While English is a world language, German is predominantly a regional language. The strong popularity of German, as opposed to, for example, the low ranking of French, indicates a strong weight attached to Germany as a future economic partner and a future (labour) market.

4 Assessing future migration potential

There is a whole body of literature that attempts to predict the size of possible labour migration from the AC-10 to the rest of the EU member states in the years following accession. In this chapter, some of this work is critically reviewed. Studies are separated into two categories: first, quantitative studies that use econometric models to make predictions on future migration potential, and second, studies based on surveys carried out at a household or individual level in which individuals are asked about their intentions regarding migration to an EU member state after enlargement.

Studies based on econometric predictions

Theoretical Basis

Models that forecast future migration flows from the accession countries to the EU are typically based on econometric models that use as an input historical data on migration flows from countries other than the CEECs (see Fertig (2001); Boeri and Brücker (2000); Bauer and Zimmermann (1999)). A variety of estimation specifications are used in this literature. The theoretical bases for the empirical specification are simple economic arguments that relate migration to differences in returns to human capital and costs of migration (see Sjaastad (1962) and Harris and Todaro (1970) for early theoretical work).

Some of the enlargement papers (e.g. Boeri and Brücker (2000); Fertig (2001)) refer to Hatton's (1995) more elaborate model as a motivation for their specification. Hatton develops his model assuming that the individual migration decision is determined by considerations about relative earnings, employment and non-pecuniary costs of migrating to another country. His estimation equation is a relationship between migration rates and differences in key economic indicators, like income and employment. In addition, the costs of migration enter the formulation proxied by the stock of immigrants from the individual's origin country who reside in the destination country. Although carefully derived, Hatton's model is based on a number of *ad hoc* assumptions (such as the particular process of expectation formation about future income streams or the determinants of the costs of migration). He clearly acknowledges this by saying that *"it is worth emphasising that the model developed here is only one among many different functional forms that could be developed".* [20]

Studies like Fertig (2001) adopt a very similar specification. Others (e.g. Bauer and Zimmermann (1999)) claim that their work follows the "empirical literature on migration" and estimate simpler equations. One may conclude that the economic motivation for the development of estimation equations in most of these studies is a suggested relationship between migration propensities and costs and benefits of migration. Estimated parameters in these studies have no clear structural interpretation.

Model estimation

Most of the studies estimate in a first step the association between past migration flows and variables that measure differences in economic conditions as well as approximations for non-monetary costs of migration. Studies vary in the range of variables they include. Usually, the difference in income per capita between sending and receiving countries is taken as a proxy for differences in real wages. Unemployment rates in sending and receiving countries are used as an indicator of the labour market situation and of the probability of employment. The stock of

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[20] Hatton (1995).

immigrants from the sending country in the receiving country is sometimes interpreted as a proxy for the cost of migration. As past migration movements were accompanied by a variety of regulations and institutional features, indicators of the existence of free movement or guest worker agreements between sending and receiving countries are generally introduced in the estimation specification.

Empirical analyses of international migration rest on aggregate data. In the particular case of (gross or net) emigration from a set of origin countries to a single destination these models take the generic form:

$$m_{s,t} = \mu_s + X_{s,t}\beta_s + \delta m_{s,t-1} + \varepsilon_{s,t} \qquad (1),$$

where $m_{s,t}$ typically denotes an appropriate measure of the aggregate migration rate (i.e. actual migration as a proportion of potential migrants at the origin) from sending country s in year t. The parameter μ_s captures all unobservable aspects of the process that are specific to country s but constant over time, while the k-dimensional matrix $X_{s,t}$ denotes the observable time-varying characteristics of country s at time t (relative to the destination). β_s are vectors of unknown parameters to be estimated. The lagged dependent variable introduces dynamics into expression (1)[21]. Finally, $\varepsilon_{s,t}$ is the error term reflecting all unsystematic influences on the process. In Hatton (1995), the dynamic structure is motivated by the way he models *individual* migrants' expectations about future utility streams.

Variations of this generic form are typically more restrictive, either by expressing country-specific intercepts as a linear combination of time-constant observable characteristics, by imposing equal slope coefficients across countries, ($\beta_s = \beta \ \forall s$), by omitting the lagged dependent variable or by a combination of these restrictions. Usually, this model specification and the concrete choice of explanatory factors included in X is more or less based on microeconomic considerations relating the individual decision to migrate or not to rational economic behaviour in the context of utility or income maximisation.

Predictions of migration flows

In the second step, and based on estimation results from the first step, the (potential) future migration flows are predicted.

This process has to deal with a number of very serious problems which, when not taken into account, put the resulting predictions into question. These should be kept in mind when evaluating the predictions of the models. The main problems that may affect the accuracy of predictions are the following:

- A: use of information of historical migrations to predict future migration flows.
- B: conceptual problems, and problems concerning methodology and empirical specification.
- C: problems directly related to the shortcomings of the available data material.

A: Use of information of historical migrations to predict future migration flows

Let us, for the moment, ignore problems B and C. In other words, let us assume that estimation is based on a true model of migration flows between different countries and the data are exact measures of the variables used in the specified model. Let us also assume that the specification

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[21] δ < 1 is a necessary condition for the stationarity of the process.

is general enough so that no invalid restrictions are imposed on the data. Then the estimated coefficients reflect those parameters that characterise the underlying structure of migration between a given destination country and the historical sending countries.

In the period after WWII, hardly any migration took place from the CEECs into Western Europe. This implies that studies which attempt to make predictions on the future migration from these countries have to use historical data on countries other than the CEECs in the estimation stage. As a consequence, the whole forecasting exercise relies on parameters that refer to a non-overlapping set of emigration countries. In order to use the coefficients obtained from these origin countries to predict future migration flows from the CEECs it is necessary to make assumptions about the way the estimated structure reflects the responsiveness of future accession countries to variables measuring costs and benefits of migration. In other words, one needs to assume that migration decisions will respond to the same factors in the same way as reflected by data on historical migration countries. Note that two assumptions are implicit here. First, an assumption of invariance across countries. Second, an assumption of invariance across time. The latter assumption means that future migrations react to changes in economic factors in the same way as past migrations. It is most unlikely that these assumptions hold.

Adding to this problem is the inability of economic and non-economic variables included in the estimation equation to explain much of the variation of migrations across emigration countries or through time. For example, only a small part of the differences in immigration to Germany from Greece and Turkey is explained by variables usually used as regressors in these models, like differences in GDP. The variation not explained by the model structure is that of the base migration flows net of those flows explained by time- or space-varying variables. In the estimation equation, it is reflected by differences in the estimated constant terms for the particular country (country-specific factors). However, as historical migration countries do not overlap with future accession countries, the analyst faces a serious dilemma: which country-specific term should be used when predicting future immigration from, e.g., Poland to Germany? The choice of these terms results in large differences in predicted migration rates.

Studies like Fertig (2001) and Boeri and Brücker (2000) address this problem by explicitly modelling differences in country specific effects by time constant factors like distance between capitals, indicators for common language or development indices. This in effect amounts to adding additional variables to the model that absorb additional variation in migration rates across countries. It may reduce the problem as long as additional variables are able to reflect part of the unexplained variation between emigration countries, but it does not eliminate it. Predictions will again be based on some *ad hoc* assumptions about the base migration flow.

Another important assumption in these studies is that immigration into other potential destination countries varied proportionally to observed migration flows over the considered time horizon. For instance, if a substantial increase in immigration figures to Germany from, say, Turkey is accompanied by a moderate increase in the income differential between Turkey and Germany, one would conclude that this moderate increase has led to the greater inflow. But if, at the same time, economic prospects in other potential destination countries deteriorated considerably, the large increase in immigration to Germany might simply stem from a redirection of flows. This argument naturally extends to the implied stability of the political and institutional environment.

B: Conceptual problems and problems concerning methodology and empirical specification.

Specification and methodology are in themselves highly critical. First of all, the conceptual framework within which most of the analyses are embedded is basically a static model of migration where the migration decision at any point in time is related to considerations about earnings differences and considerations about non-monetary benefits. An implicit assumption is that any migration decision is permanent. This is, however, far from being realistic. There is a lot

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of evidence showing that in fact many modern migrations are actually temporary (see Dustmann (1996) for evidence in Europe). It is highly probable that many of the expected future migrations from EU enlargement countries will likewise be temporary. Neglecting this issue may lead to seriously biased estimates of the future migration potential, especially when aggregating up migration flows to obtain stock data at any one point in time.

An additional problem for predictions is that the explanatory variables (like per capita incomes, unemployment rates etc. both in the receiving and sending countries) have to be forecasted for the entire prediction period. This of course is a difficult problem in itself, and adds substantial error to migration predictions.

Also, the underlying conceptual framework assumes that migrations respond solely to economic considerations of the individual immigrant. However, European countries are not classical immigration countries. They do not have well defined immigration laws, like the US and Australia, for instance. Migration to Europe in the post-war period has been heavily influenced by short term demands of national labour markets, colonial history, family re-unification and the amount of accepted asylum and refugee seekers. In other words, migrations have been heavily regulated, in contrast with the theoretical framework, and are therefore different from the migrations we may observe within a European labour market under free movement of labour. This clearly affects the ability of these models to predict future migrations.

Problems with the *ad hoc* way of specifying the estimation equations have already been discussed. At the stage of empirical implementation, there are additional assumptions imposed that may be hard to justify. For instance, the assumption made in some studies that the slope (response) parameters are the same for all countries is very strong. In Fertig (2001) and Boeri and Brücker (2000), for instance, it implies that immigration from countries such as Austria, Norway, UK or the US responds to a change in relative GDP in the same way as immigration from Greece, Turkey or Yugoslavia.

In the case of pooled data sets, parameter estimation by pooled OLS invokes a set of severe covariance restrictions. Specifically, this estimation procedure requires the assumptions of homoscedasticity across regions and time, no correlation across regions and no autocorrelation across time. For a sufficiently heterogeneous sample of sending countries this seems to be quite unlikely. For example, if there are unobserved shocks which affect migration streams from different countries in a similar manner, observed migration figures may be correlated across groups. Also, it is quite likely that shocks will exist which will lead to a correlation across time. Finally, the sheer difference in magnitude of inflows from different countries of origin may lead to a non-constant variance across countries.

C: Problems directly related to the shortcomings of the available data material

The available data material for migration often has serious shortcomings. For instance, the definition of immigrant status for German data is based only on nationality, and not country of birth. This excludes immigrants who have obtained German citizenship, but includes immigrants of second and higher generations who have retained the nationality of their parents' home country – the majority in the case of Germany. For the UK, no administrative records on net migration are available, so that analysis has to rely on survey data.

Some studies predicting EU enlargement migration potential

This literature is now illustrated by comparing in Table 4.1 three studies that make migration forecasts using the parameters estimated in the first stage of the process. The different studies make predictions of migration flows to different countries or regions. Boeri and Brücker (2000) use their model to predict migration flows from the CEECs, Bulgaria and Romania to Germany.

Then they take the distribution of immigrants from the CEEC-10 to the European Union in 1998 and use it to extrapolate their predictions. Supposing that the relative number of migrants going to each European country is going to remain constant at the same level as in 1998, they forecast future migration flows to the whole EU-15 from the CEEC-10.

Fertig (2001) only predicts the number of future migrants from the CEEC-10 to Germany. However, for the sake of comparison, a column is included in Table 4.1 in which the same extrapolation as Boeri and Brücker do is calculated, so as to have comparable figures of migrants to the entire EU.

Bauer and Zimmermann (1999) use the coefficients estimated in the first part of their model to predict the percentage of the population in certain CEECs which will migrate to the EU. Once again for the sake of comparison with the figures from other studies, in the last column an estimate of the total number of migrants to the EU is included, which is obtained by applying the estimated percentage figure to the total population of each corresponding country in 2000.

The figures reported in the last column result, therefore, from different approximations and extrapolations. Bearing this in mind, they nevertheless allow a comparison of the forecasts of different studies. The conclusions of the three studies seem to be similar, since all of them make quite low predictions of migration potential from the CEECs. According to the figures reported in the last column, between 70,000 and 260,000 immigrants per year would migrate to the EU-15 countries after the current enlargement.

Note that these studies suffer from the problems and shortcomings discussed above, and the predicted figures therefore need to be evaluated with some caution.

Table 4.1. Selected studies predicting migration potential

1st stage: Parameter estimation		2nd stage: forecast for CEEC-10[1]		
Destination country / Sending countries	Period	Flow per year (persons)	Total (Germany) 2005-15[2]	Total (EU-15) 2005-15[2,3,4]
Fertig (2001)				
Germany / Austria, Belgium, Denmark, Finland, France, Greece, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, UK, US and (former) Yugoslavia,	1960-1994	Medium convergence[5,6] — Starting with 76,770 in 1996, declining to 64,768 in 2015	673,502	1,036,000
		No convergence[5,7] — Starting with 78,430 in 1996, declining to 69,306 in 2015	712,844	1,096,000
Boeri and Brücker (2000)				
Germany / Austria, Belgium, Denmark, Finland, France, Greece, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, UK, US and (former) Yugoslavia.	1967-1998	Baseline[8,9] — Starting with 218,429 in 2002, declining to 53,720 in 2015	942,700	1,449,000
		High convergence[8,10] — 175,189 in 2002, declining to 33,444 in 2015	678,862	1,044,000
		Low convergence[8,11] — 241,443 in 2002, declining to 69,565 in 2015	1,126,185	1,732,000
Bauer and Zimmermann (1999)				

			Poland	Czech Republic	Slovakia	Hungary	Slovenia	
EU / Greece, Spain and Portugal	1985-1997	Total sample[12]	1.83	0.46	0.41	1.05	0.15	883,505
		Restricted mobility[13]	1.29	0.74	0.36	0.94	0.22	691,527
		Free mobility[14]	6.11	0.33	0.95	2.20	0.13	2,614,544

[1] CEEC-10 are the eight CEECs, Romania and Bulgaria. Note that Bauer and Zimmermann report percentage emigration rates only for selected countries.

[2] Figures in this column are not strictly comparable across different studies, since they refer to different receiving and sending countries and time periods.

[3] The figures reported in this column for Fertig (2001) and Boeri and Brücker (2000) are extrapolations based on the 1998 distribution of migrants from the CEEC-10 across member states. According to this distribution, 65% of migrants from these countries chose Germany as a destination country.

[4] The figures reported in this column for Bauer and Zimmermann (1999) are obtained after applying their estimated emigration rate for each sending country to this country's population in the year 2000, according to the UN Population Database. Note that they only include potential migrants from five countries, whose population in 2000 amounted to 64% of the total CEEC-10 population.

[5] Assumptions in Fertig, all scenarios: per-capita income in Germany grows at a constant real rate of 2% per annum. Unemployment rates in CEEC-10 stay constant at 1995 level. Partial recovery of birth rates in CEEC-10 (based on World Bank projections). Human Development Index stays constant at 1996 level. Complete freedom of movement.

[6] Assumptions in Fertig, scenario of medium convergence: 2% annual convergence of per capita income between Germany and the CEEC-10. Unemployment rate in Germany stays constant at 8.6% per annum (based on 8-year average).

[7] Assumptions in Fertig, scenario of no convergence: 0% annual convergence of per capita income between Germany and the CEEC-10. Unemployment rate in Germany constant at 5%.

[8] Assumptions in Boeri and Brücker, all scenarios: Population change based on Word Bank projections. Complete freedom to move from 2002 onwards.

[9] Assumptions in Boeri and Brücker, baseline scenario: convergence of per capita incomes to the average per capita PPP-GDP in the EU at a 2% rate per annum. 1997 unemployment rates of both Germany and CEECs remain constant.

[10] Assumptions in Boeri and Brücker, high convergence scenario: convergence of per capita incomes to the average per capita PPP-GDP in the EU at a 3% rate per annum. Unemployment rate of Germany constant at 10%, CEECs' unemployment rates constant at 5%.

[11] Assumptions in Boeri and Brücker, low convergence scenario: convergence of per capita incomes to the average per capita PPP-GDP in the EU at a 1% rate per annum. Unemployment rate of Germany constant at 5%, CEECs' unemployment rates constant at 10%.

[12] Bauer and Zimmermann, total sample: predictions obtained using coefficients estimated using sample with all sending countries during entire period 1985-97.

[13] Bauer and Zimmermann, restricted mobility: predictions obtained using coefficients estimated using sub-sample of the period during which labour mobility between Greece, Spain and Portugal to the other EU members was restricted (Greece: 1985-1987, Spain and Portugal: 1985-1991).

[14] Bauer and Zimmermann, free mobility: predictions obtained using coefficients estimated using sub-sample of the period during which free mobility between all countries was allowed (Greece: 1987-1997, Spain and Portugal: 1992-1997).

Studies based on surveys

The second type of study aimed at predicting migration potential is that based on surveys. In these surveys, individuals are directly asked how likely it is that they will migrate. The main drawback associated with this methodology is that they are based on migration intentions, which are seldom realised. Specific estimates of the size of potential migration flows require a prediction of the percentage of people who will actually migrate, out of all those who have expressed a willingness to do so. Depending on the figure chosen, predictions can vary considerably.

An advantage of the surveys is that they allow distinguishing micro-level characteristics of potential emigrants (such as sex, age, education, etc.) that are usually obscured when using macro-level data. Information about the intended duration of migration or the targeted countries can also be drawn from individual-level studies. Moreover, if the same questions are asked in different countries, a comparative analysis of responses can be made.

One of the most important studies of this type for Central and Eastern European countries is a survey carried out by the International Organisation for Migration (IOM) in 1998[22]. Eleven Central and Eastern European countries were included in the survey, and the same questions were asked to representative samples of at least 1,000 people in each of them, allowing for a comparative analysis of migration potential in those countries. In what follows results are only reported for those countries in the survey that are currently candidates to join the EU in 2004, that is, the Czech Republic, Hungary, Poland, Slovakia and Slovenia. The rest of the candidate CEECs, that is, the Baltic states, were not included in the study. However, 90 per cent of the population of the current accession countries[23] lives in one of the five countries that are included.

An important feature of this study is that it distinguishes among three different types of migration:
- *Permanent migration.*
- *Long-term temporary labour migration,* which would last for several years, such as migration of "guest workers" to Germany, Austria and Switzerland in the 1960s and 1970s.
- *Short-term temporary labour migration*, which would include cross-border commuting, seasonal and casual work. This type of migration would generally allow migrants to keep their homes and families in their origin countries.

Figure 4.1 illustrates the migration intentions of individuals separated by type of migration intended. Figures represent the percentage of individuals who reported being "likely" or "very likely" to migrate for the stated period of time. Answers are not exclusive. It can be seen that in all countries the most preferred option is working abroad for a short period (several weeks or months). Slovakia is the country with the highest short-run temporary migration potential (56% of people would like to work abroad for a few weeks, 47% for a few months), followed by the Czech Republic (49% and 44%) and Poland (46% and 37%, respectively).

Percentages decrease considerably when long-term labour migration is considered. The country with the highest long-run temporary migration potential is again Slovakia (27%), followed by the Czech Republic (24%) and Hungary (20%).
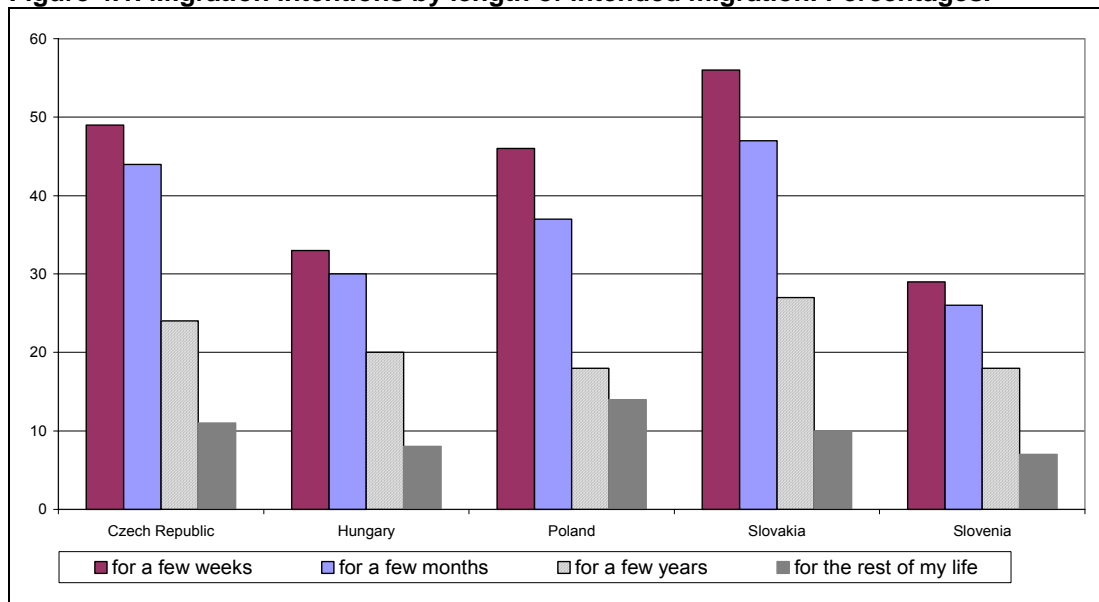
The percentage of people who want to migrate permanently is quite low, never reaching 15 per cent of the population. Poland is the country with the highest potential for permanent migration (14%), followed by the Czech Republic (11%) and Slovakia (10%).

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[22] IOM (1998).
[23] According to figures computed using the World Development Indicators Database (The World Bank, (2002)), the Czech Republic, Hungary, Poland, Slovakia and Slovenia account for 90.18 per cent of the population in the CEECs and 88.80 per cent of the population in the AC-10.

The fact that the likelihood of migration decreases with the length of migration is interpreted in the IOM study as a suggestion that the people in the CEECs do not want to permanently leave their homes, but rather to supplement their incomes by spending some time working in countries with much higher average wage rates. This would imply that bordering countries like Germany and Austria are much more likely recipients of these emigrants. It also suggests that a temporary restriction of immigrant inflows on the side of Germany and Austria would not lead to a substantially higher migration flow to the UK.

Figure 4.1. Migration intentions by length of intended migration. Percentages.

Source: IOM (1998).
Definition: each category represents the percentage of people in that country who are "likely" or "very likely" to migrate for the stated duration.
Notes:
Categories are not exclusive.
Percentages computed over total sample.

Table 4.2 displays the countries to which most of the interviewed individuals would like to emigrate. Figures without brackets refer to the percentage of people who wish to work in the corresponding country for a restricted period, or commute to these countries, while figures in brackets refer to those who wish to migrate permanently. Since figures are obtained from the answers to a multiple-response question, it is not possible to add them up in order to determine each country's overall propensity to work abroad or to emigrate. The figures do indicate, however, which countries are more popular for potential migrants.

Germany is most popular for labour migration among individuals from the Czech Republic, Hungary, Poland and Slovakia. It is followed by Austria, the US and the UK.

The situation changes when people are asked about the country where they would like to migrate permanently. First, in all countries the propensity to migrate permanently is lower than to migrate temporarily or to commute. Second, the ranking of countries changes: the US is chosen in first place by individuals in the Czech Republic, Poland and Slovakia, while Germany is the preferred location only for Hungarians.

The willingness to migrate to one of the other accession countries is quite low in all cases. The only exception is Slovakians willing to migrate temporarily to the neighbouring Czech Republic.

The figures for Slovenia are considered separately because there is no separate information in this case for the two types of migration. In any case, the figures are quite low for all of the targeted countries.

Table 4.2. Target countries for migration to work[1] and to emigrate[2]. Percentages.

Target countries	Origin countries									
	Czech Rep.		Hungary		Poland		Slovakia		Slovenia[3]	
Germany	38	(5)	25	(10)	36	(15)	17	(0)	1	(0)
Austria	26	(6)	13	(6)	4	(3)	8	(1)	4	(0)
UK	24	(5)	3	(2)	6	(7)	4	(0)	2	(0)
France	17	(6)	2	(2)	5	(5)	2	(1)	1	(0)
Scandinavia	17	(10)	2	(2)	5	(5)	1	(1)	1	(0)
Other EU	4	(5)	1	(1)	4	(5)	3	(1)	1	(0)
US	30	(14)	5	(7)	10	(20)	6	(10)	2	(0)
Czech Rep.	-	-	-	-	1	(0)	5	(2)	-	-
Hungary	2	(1)	-	-	-	-	1	(1)	-	-
Poland	2	(0)	-	-	-	-	1	(0)	-	-
Slovakia	1	(1)	-	-	-	-	-	-	-	-
Slovenia	-	-	1	(0)	-	-	-	-	-	-

Source: IOM (1998).
Notes:
Percentages computed over total sample.
Categories are possible answers to multiple-answer questions "To which country are you most likely to go to look forwork?" and "To which country are you most likely to emigrate?"
[1] Figures without brackets indicate the percentage of people who want to work abroad temporarily.
[2] Figures with brackets indicate the percentage of people who want to migrate permanently.
[3] There is no accurate information for Slovenia because only one question ("To which country are you most likely to go to work or to emigrate in?") was asked in this country.

As mentioned above, the main problem associated with the use of surveys for estimating migration potentials is the uncertainty about the number of people who will eventually behave as reported. The fact that one individual considers herself "likely" to move abroad does not necessarily imply that she will do so.

An approximate idea can be obtained by asking people about the actual steps they have undertaken to prepare for migration. Table 4.3 shows that in fact very few people have undergone any kind of preparation, except in the case of Poland. This fact may indicate that emigration potential is higher in Poland than in the other four countries.

It is interesting to note, as is observed in the study, that the kind of preparations most people seem to have made are consistent with temporary migration or cross-border commuting, rather than permanent emigration. This further supports the idea that the potential for permanent emigration in the CEECs is very low.

Table 4.3. Preparations for going abroad. Percentages.

	Czech Rep.	Hungary	Poland	Slovakia	Slovenia
Learned a foreign language	24	13	39	21	14
Obtained information	13	8	38	15	9
Obtained qualifications	17	10	21	9	13
Applied for jobs	5	4	28	4	2
Looked for somewhere to live abroad	5	2	23	4	2
Applied for permit	3	3	24	3	2
Contacted people	3	6	16	2	2
Sold property	1	0	11	2	2
Other preparations	4	2	12	2	3

Source: IOM (1998).
Notes:
Percentages computed over total sample.
Categories are possible answers to multiple-answer question "Have you taken any of the following steps to prepare for migration over the last years?"

Individuals participating in the survey were asked about the importance they assigned to several reasons for migrating. Table 4.4 gives the percentages of people who considered that the stated reason would make them "more likely" or "somewhat more likely" to go abroad. A distinction is made between *push* factors (those circumstances in the origin country that may encourage people to leave) and *pull* factors (circumstances in the destination country).

Economic conditions in the home country are the most important push factor. More than 45 per cent of the people in the Czech Republic, Hungary, Poland and Slovakia believe that they are not going to improve. In the case of Slovenia, where economic conditions are better nowadays than in any of the other CEECs[24], the results are more optimistic, and only 32 per cent of the population believe that economic conditions will stay as they are or deteriorate. Remember that the survey dates back to 1998. Therefore, improvements in living conditions over the last four years may have considerably reduced the migration potential from these countries.

The existence of ethnic problems in the home country is a further push factor. This is perceived as particularly serious in Slovakia, where 51 per cent of the interviewees indicate that they consider it as a reason for leaving the country.

In terms of pull factors, most people mention the existence of better living conditions and higher wages abroad. Experiences of people who had previously migrated, favourable employment opportunities as well as greater freedom abroad are other important reasons. Slovenia is the country in which least importance is assigned to every proposed pull factor, in accordance with the low migration potential associated with this country.

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[24] As can be seen in Table 3.3, Slovenia has the highest PPP GDP per capita and the second lowest unemployment rate of the CEECs.

Table 4.4. Reasons for migrating. Percentages.

	Czech Rep.	Hungary	Poland	Slovakia	Slovenia
Push factors					
Economic conditions will continue as they are or deteriorate	48	45	61	58	32
Ethnic problems in home country	25	34	29	51	14
Pull factors					
Better living conditions abroad	73	66	83	77	51
Higher wages abroad	67	58	75	73	45
Other people's experience was good	55	45	71	65	33
Good employment opportunities for people with respondent's characteristics abroad	42	45	73	49	41
Greater freedom abroad	36	36	42	56	21

Source: IOM (1998).
Notes:
Percentages computed over total sample.
Figures represent the percentage of people who said that the proposed reason would make them "more likely" or "somewhat more likely" to go abroad.

As is shown in Table 4.5, the main reason encouraging people to stay in their home country is the importance of their family and friends. This indicates that many potential migrants trying to improve their financial condition would favour a situation which did not require leaving their home on a permanent basis.

Table 4.5. Reasons for staying. Percentages.

	Czech Rep.	Hungary	Poland	Slovakia	Slovenia
Ties to home					
Ties to family, friends	89	91	86	87	88
Respondent has a job in origin country	51	53	72	54	72
Living conditions will improve in home country	42	65	62	54	69
Barriers to leaving					
Uncertainty associated with migration	71	71	73	70	79
Difficult to go to Western countries legally	31	58	60	53	68
Guest workers badly treated abroad	37	55	64	52	58
People from respondent's country not respected abroad	42	52	63	51	45
Other people's experience was bad	16	34	46	23	43

Source: IOM (1998). Notes:
Percentages computed over total sample.
Figures represent the percentage of people who said that the proposed reason would make them "more likely" or "somewhat more likely" to stay in home country.

Two surveys undertaken in Hungary[25] and Bulgaria[26] further support the prediction that the migration potential after enlargement is rather limited. According to the Hungarian survey, 11 per cent of people are likely or very likely to emigrate. According to the Bulgarian survey (note that Bulgaria is not one of the AC-10 countries), 8 per cent of people consider it probable or very probable that they will migrate permanently, 7 per cent that they will undergo short-term migration in order to find a job in the EU, and 5 per cent that they will migrate for a period shorter than a year. Those Hungarians with the highest propensity to migrate are young, single, well educated and either still studying or unemployed. Thirty-two per cent would want to migrate to Germany, 19 per cent to Austria and 7 per cent to the UK. Twenty-three per cent of Bulgarians planning to migrate would want to go to Germany and 6 per cent to the UK.

So how large, according to these studies, is the migration potential to the EU-15? Some 'back-of the-envelope' calculations are useful to illustrate its magnitude. No direct evidence is available about the percentage of individuals who realise their intentions. Some evidence can be gathered from other sources, though. For *immigrants* in Germany who reported in 1984 intentions to *go back* to their home countries, about 25 per cent did in fact return over the next 14 years[27]. Given the fact that these numbers refer to re-migration of immigrants who have been in Germany for quite a long period already, this is likely to be an overestimate of the number of individuals from the CEECs who will eventually realise their reported intentions. For instance, in the survey for Bulgaria mentioned above, the number of individuals who would end up migrating to another country was estimated to be around 10 per cent of those who indicated that they would be "very likely" to emigrate.

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[25] Survey undertaken by the Hungarian Academy of Science in November 2001, yet to be published. Sample covers 1,500 people who are considered to be demographically representative.
[26] Survey recently presented to an EU Working Group on enlargement. Research undergone at the time of the census on the basis of an excerpt of 25,542 people aged 15 to 60.
[27] See Dustmann (2001).

In order to assess the migration potential based on these surveys, it will be assumed that 15 per cent of all the individuals who considered themselves to be "likely" or "very likely" to emigrate will eventually realise their intentions.

According to the IOM survey, roughly 10 per cent of the population of Eastern enlargement countries has the intention to migrate permanently. Assuming therefore that approximately one out of six individuals realises this intention, the total number of permanent emigrants would be expected to be around 1.11 million (taking the entire CEECs' population as a base)[28]. This number is in the range of predictions of the econometric studies mentioned above, although the intention surveys do not refer to a particular time period.

As regards temporary migrations, about 20 per cent of the populations of the five CEECs interviewed are willing to migrate for several years. Note, however, that answers to these survey questions are not exclusive. Many of those who indicated that they would be willing to emigrate on a permanent basis are therefore also likely to have indicated temporary migration. Therefore, any predictions based on these numbers can not be simply added up. Performing a similar calculation on temporary migration potential leads to an estimate that is about double the estimate for permanent migration – about 2.22 million. This number is at the upper bound of migration forecasts based on econometric models.

How many of those would choose the UK as a destination? According to the figures in Table 4.2, the UK is far less attractive as a European destination than Germany and Austria, so only a small fraction of potential immigrants are likely to target the UK.

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[28] According to The World Bank (2002), the CEECs' population in 2000 amounted to 73,769,250 individuals.

5   Past enlargement experiences

The accessions of Greece, Spain and Portugal are often seen as relevant models for comparison with the present enlargement. The last enlargement in 1995 to include Austria, Sweden and Finland is not an appropriate benchmark for studying the current one, as there was no significant gap between the accession countries and the EU member states in terms of income. Furthermore, free movement of workers was already applicable prior to accession, because Austria, Sweden and Finland were members of the European Economic Area (EEA). Therefore, no particular transition measures were contemplated in the accession treaty.

However, at the time of the accessions of Greece, Spain and Portugal, significant concerns existed in relation to expected labour migration. Factors such as the high income differentials and the high unemployment and propensity to migrate in these Southern European countries, together with the geographical proximity and the long tradition of emigration towards Western Europe raised expectations of cheap labour flooding the "old" member states as soon as the new countries were conferred member status.

Fears of large migration flows have also been expressed with regard to the future Central and Eastern European entrants. In this context, the imposition of a transition period has been agreed by the member states. Transitional arrangements were also applied at the accession of Greece in 1981 and Spain and Portugal in 1986. The transition period agreed in the case of the accession of Greece was six years. In the case of Spain and Portugal, it was seven years, although it was eventually reduced to six years, as fears of major migration flows did not materialise.

The accessions of Greece, Portugal and Spain are often referred to as the "Southern enlargement", and the three countries together can be compared with the then nine member states of the EC. To illustrate the similarities and differences between the Southern enlargement and the current one, in Table 5.1 the situation of these countries in 1981 (the year of the Greek accession) and 1986 (the year of the accessions of Portugal and Spain) is compared with that of the current accession countries in the year 2000.

Table 5.1.   Comparison between Southern and Eastern enlargement. Population, GDP and PPP GDP per capita.

Southern accession countries				Eastern accession countries
	1981	**1986**	**2000**	
Population as a percentage of EC-9	20.57	20.87	19.90	Population as a percentage of EU-15
Total GDP as a percentage of EC-9	10.19	9.69	4.17	Total GDP as percentage of EU-15
PPP GDP per capita as a percentage of EC-9 average	64.89	61.45	45.43	PPP GDP per capita as a percentage of EU-15 average

Source: Calculations made using data from the World Development Indicators Database. The World Bank (2002).

As shown in the first row of Table 5.1, the population of the Southern accession countries relative to that of the EC-9 was very similar to the population of the Eastern accession countries relative to the EU-15. However, GDP in Greece, Spain and Portugal was relatively larger than that of the current AC-10. The percentage of total GDP relative to that of the existing EC-9 countries was about twice the size of that of the Eastern accession countries relative to the EU-15 countries. Differences in PPP GDP per capita were much smaller, however.

There are a number of major differences between the historical Southern enlargement, and the upcoming Eastern enlargement[29]. First, the status of the market economy is different in the two groups of accession countries. Greece, Spain and Portugal had always been market economies before their accession. In contrast, the CEECs only started their conversion into market economies at the beginning of the 1990s. Even though the transformation has been enormous (the Commission recommended the conclusion of the accession negotiations with Malta, Cyprus and the CEECs based on its judgement that they fulfil the criteria for accession, including the "existence of a functioning market economy"[30]), the lower degree of maturity of these market economies implies that they are not as fully developed today as those of the Southern enlargement countries were before their accession.

The second important difference is the income gap. At the time of Greece's accession, the average PPP per capita GDP for the three Southern enlargement countries was 64.89 per cent of that of the nine EC member states. Five years later, it was 61.45 per cent, still much higher than 45.43 per cent for the CEECs relative to the EU-15[31]. The implications of this disparity for potential migration are that if differences in relative income are an important determinant of migration flows, these could be expected to lead to a higher potential migration pressure from the CEECs into the EU-15 than those that took place at the time of the Southern enlargement.

Geographical distance is mentioned as a third difference in the Commission's Enlargement Paper: "Greece and Portugal have no common border with the EC-9 countries, and the Spanish regions bordering France had an income much above the already high national average. By contrast, half of the CEECs have a common border with Austria, Germany or Italy, which makes commuting feasible, especially since border regions are relatively densely populated".

Finally, there are major differences concerning the agricultural sector. A comparison of the situation of this sector in the Southern accession countries at the time of that enlargement, and in the current accession countries in 1999 is presented in Table 5.2. The scarcity of data implies that some of the figures should only be seen as approximations. As is indicated in the footnotes, there are missing data for certain countries in certain years, and for other countries there are no data available. However, the Table gives a clear picture of the similarities and differences between the agricultural sector in the two groups of accession countries.

The first two rows of Table 5.2 show that the relative importance of this sector (in terms of percentage of total GDP and total employment) is lower in the current accession countries than it was in Greece, Portugal and Spain. However, the important point is that both output per unit of land and productivity (output per worker) are much lower in the Eastern enlargement countries. In 1986, output per unit of land in the Southern accession countries was 53 per cent of the EC-9 average. For the Eastern enlargement countries, it was just 23 per cent of the EU-15 average in 1999. Output per worker was 34 per cent of the EU-9 average in the Southern accession countries in 1986. For the Eastern accession countries, it was only 11 per cent of the EU-15 average in 1999.

The productivity of the agricultural sectors varies widely among the current accession countries, but the low average value indicates that there are regions in these countries that still have to undergo important transition processes. The Commission enlargement paper[32] suggests that this is the case for small-scale family farms which are characterised by hidden unemployment, low skills, difficult access to inputs and inefficient scales in imperfect market conditions. The re-

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[29] From European Commission (2001a).
[30] See European Commission's Regular Reports on each EU candidate country, 9 October 2002, which can be accessed through the European Commission's Enlargement Website: http://europa.eu.int/comm/ enlargement/candidate.htm

[31] PPP GDP per capita in Spain, Portugal and Greece in 1986 was higher than in 1981. The relative deterioration relative to the EU-9 is due to the fact that average EU-9 PPP GDP pc grew at higher rates during this period.
[32] European Commission (2001a).

structuring process of these areas in countries like Poland, where the overall importance of the agricultural sector is still very high, could lead in the medium-run to a worsening of the relative position of the accession countries with respect to the EU member states, with a marked increase in unemployment rates, and an increase in migration potential.

Table 5.2. Agricultural sector in accession and member state countries at the time of enlargement.

	Southern enlargement				Eastern enlargement [1]	
	1981		1986		1999	
	Acc. Countries	EC-9	Acc. Countries	EC-9	Acc. Countries	EU-15
Value added as % of GDP	11.68	3.72	9.89	3.23	4.47 [2]	2.53 [3]
Employment as % of labour force	25.63	6.08 [4]	22.03	5.05 [4]	14.57 [5]	4.44 [5]
Output per unit of land	n.a.	n.a.	942	1,773 [6]	375 [7,8]	1,633 [9,8]
Output per worker	5,418	16,020 [10]	7,041	20,625 [10]	3,962 [11]	35,023 [10]

Source: all calculations made using data from the World Development Indicators Database. The World Bank (2002)
Definitions:
Output per unit of land is agricultural value added per hectare of agricultural land. It is measured in constant 1995 US$.
Output per worker is agriculture value added per worker. It is measured in constant 1995 US$.
Notes:
[1] Average data on Eastern enlargement accession countries do not include Cyprus and Malta.
[2] For Hungary, last data available correspond to year 1998.
[3] For Sweden, last data available correspond to year 1998.
[4] Data unavailable for Gemany. For rest of countries, data for last available year are used.
[5] Data corresponding to year 1998.
[6] Data unavailable for Germany, Ireland, Luxembourg and the UK.
[7] Data unavailable for the Czech Republic.
[8] Data corresponding to year 1994.
[9] Data unavailable for Ireland, Luxembourg, Sweden and the UK.
[10] Data unavailable for Ireland and Luxembourg.
[11] Data for Slovakia corresponds to year 1998.

Migration flows

The data used to measure the changes in stocks of migrants from Greece, Spain and Portugal, which come from the European Commission and Eurostat[33], have some problems. First, there are only figures for the period 1985-97, which means that nothing can be said about Greek emigration to the EC-9 during its transition period. Moreover, for a number of countries there are missing observations for some years, so data for the last available year is taken into account whenever a figure is missing. Therefore, it should be understood that the results presented below are approximations. Nevertheless, they are very useful at assessing the overall magnitude of the migration flows from these countries.

In 1997 there were over 447,000 Greek citizens living in the other 11 countries of the EC-12. In 1987, the total number was 345,000. This implies an increase of 102,000 in the stock of Greek citizens in the rest of the EC-12 in 10 years, that is, an increase of around 10,000 people per year[34]. In 1991, the last year of its transition period, the number of Spanish citizens living in the rest of the EC-12 was around 474,000. At the time of the Spanish accession to the EC, in 1986, it was around 495,000, so the stock of Spanish immigrants diminished during the transition period. In 1997, the last year for which figures are available, the stock had decreased again to around 470,000. The stock of Portuguese citizens in the rest of the EC-12 at the time of its accession was around 825,000. In 1991, the last year of the transition period, it was around 855,000, and in 1997 it was around 910,000. This is equivalent to an annual average of around 7,700 immigrants to the rest of the EC-12 over a period of 11 years. These numbers therefore suggest that the magnitude of the emigration from the Southern accession countries was negligible, even after the end of their transition periods.

Figure 5.1 shows the evolution of the stock of Spanish citizens in Germany and the UK during the period 1985-97. The country with the largest stock of Spanish people during this period was actually France. It is not included in the graph due to the scarcity of data, but it must be borne in mind that the stock figures in the graph are not intended to represent the EC-12 total. The two other series in the graph represent relative GDP per capita of Spain as a percentage of the German/British average and the employment rate in Spain relative to the German/British average.

The figure shows that the stock of Spanish citizens in Germany and the UK decreased both during the transition period (186,000 people in 1986, 173,000 in 1992) and in the following years (167,000 people in 1997). The yearly movements in the stock of immigrants are very small, and do not seem to be related to changes in relative income or the employment rate. By simply looking at the graph, it seems like the stock series is moving inversely to the relative employment rate series in the years following the introduction of free movement of workers, as would be expected. However, the low variation in the data (both on stocks of immigrants and employment) is not enough to produce any statistically significant evidence that this is the case.

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[33] Data are drawn from the statistical annex of Europäische Kommission (various issues): *Europäische Wirtschaft* and from EUROSTAT (various issues): *Wanderungsstatistik.*
[34] Figures taken from Salt, Clarke and Schmidt (2000).

Figure 5.1. Stock of immigrants from Spain in the UK and Germany, relative GDP pc and relative employment rate.
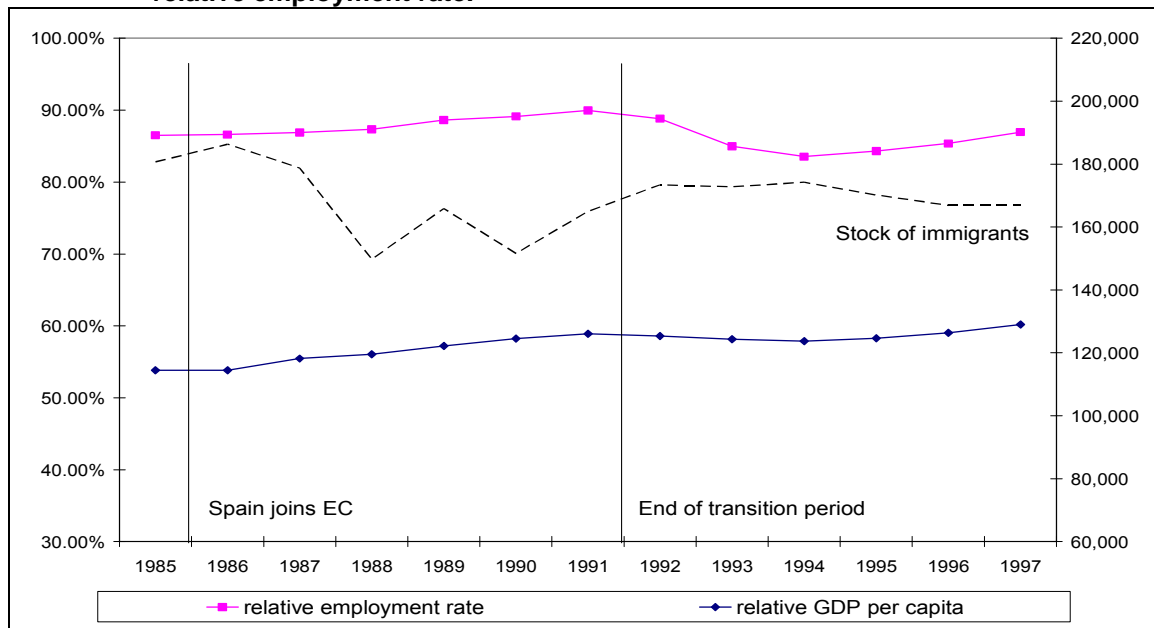
Source: Statistical annex of Europäische Kommission (various issues): *Europäische Wirtschaft* and EUROSTAT (various issues): *Wanderungsstatistik.*
Definition: Stock of immigrants measures the number of Spanish citizens in Germany and the UK.
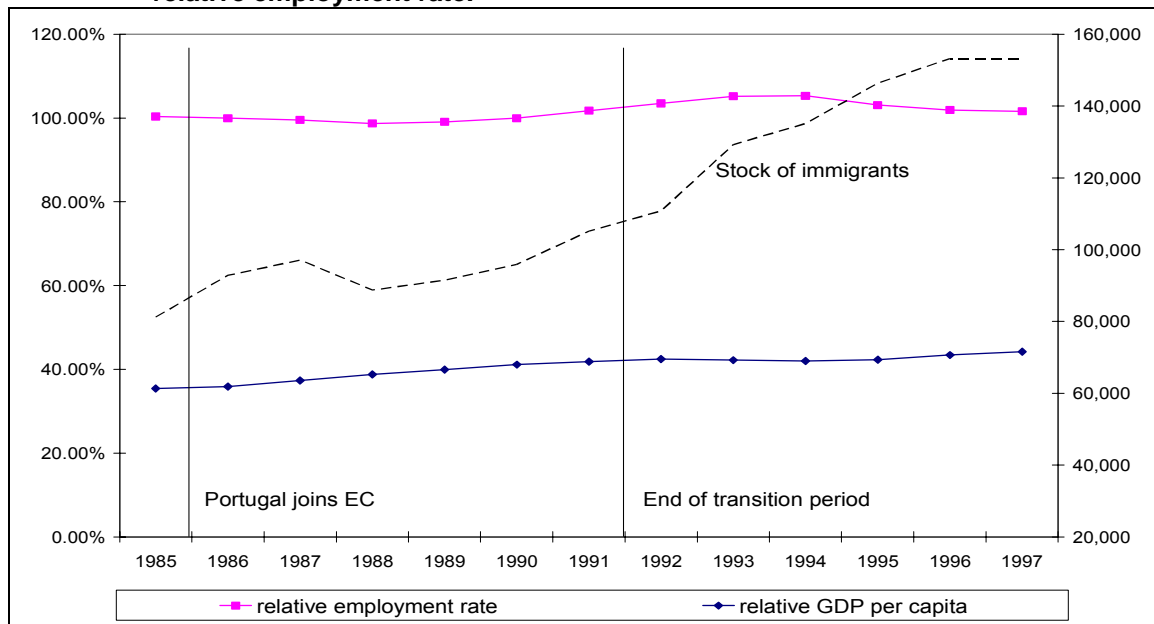Relative employment rate is the Spanish employment rate as a percentage of the German/British average.
Relative GDP per capita is Spanish GDP per capita as a percentage of German/British average GDP per capita, both measured in constant 1995 US dollars.

Figure 5.2 includes the series of yearly stocks of Portuguese citizens in Germany and the UK together with the relative GDP per capita and employment series. The stock of Portuguese migrants in the two countries increased both during the transition period[35] (92,000 people in 1986, 111,000 in 1992) and during the years of free movement of labour (153,000 people in 1997). However, the magnitude of the increase was quite low, at around 5,500 people per year during the whole 11-year period. Again, the evolution of the stocks seems to be unrelated to relative income or employment rates, and it does not seem to be influenced by the situation regarding the free movement of labour.

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[35] Note that during the transition periods only the free movement of workers is restricted. Emigrants who do not intend to work in the destination country are free to move across the EU. Moreover, it was still possible for Spanish and Portuguese citizens to work abroad with the relevant permit, as had been the case before the introduction of the transitional arrangements.

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Figure 5.2. Stock of immigrants from Portugal in the UK and Germany, relative GDP pc and relative employment rate.

Despite the lack of good data mentioned before (most notably on stocks of migrants in France), it is clear that the fears of "floods of migrants" from Greece, Portugal, and Spain did not materialise after the Southern enlargement. It can be concluded from the analysis above that there was not a clear relationship between the relative evolution of economic variables in the sending and receiving countries and the number of migrants. It does not seem likely that the migration flows would have been much higher had the corresponding transition periods not been introduced. It is not possible to know what would have happened in that case, but the absence of a dramatic increase in migration in 1992 suggests that there was not a large migration potential to the EU waiting for free movement of labour to be established. Indeed, the European Commission recommended shortening the transition periods for Portugal and Spain, initially scheduled until 1993, recognising that there was no threat of big migration flows from those countries.

These conclusions suggest that one should be careful when making predictions about future migration flows based on relative differences in economic variables. On the basis of unemployment figures, for instance, it was predicted that between 1.5 and 1.6 million migrants from Spain and Portugal would emigrate to the rest of the European Union after the transition period[36].

An important consideration for migration decisions is not only the economic conditions at a particular point in time, but also future economic prospects. Given its large costs, migration is unlikely to take place if individuals perceive that the economic situation in their country will improve. These considerations need to be taken into account when predicting the migration potential from the CEECs after the current enlargement, based on relative differences in terms of income or employment rates with respect to the EU-15.

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[36] See Straubhaar (1984)

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6 Prediction of future migration flows to the UK and Germany

Data

Before the empirical application is explained, the data used for the analysis is briefly discussed. For the two destination countries, the UK and Germany, the dependent variables are yearly net migration rates to the respective destination, which measure the difference between yearly inflows and yearly outflows relative to the population at the origin for the respective year.

The German migration data were obtained from the German Federal Statistical Office (*Statistisches Bundesamt*). Since the data only comprise "foreigners", for the years after 1990 the substantial inflow of ethnic Germans (*Aussiedler*) into Germany is not taken into account. Net migration figures for the UK were obtained from the International Passenger Survey (IPS). The data were gathered from the annual reference volumes on migration published by the Office of Population Censuses and Surveys (until 1993) and by the Office for National Statistics (since 1994), and from the Migration Statistics Unit in the Office for National Statistics.

The two main sources of data on net immigration into the UK are the Labour Force Survey (LFS) and the IPS[37]. In principle, it is possible to derive the figures on net migration rates used in the empirical analysis from the LFS. This can be done by calculating the differences in stocks of migrants from each sending country for every two consecutive years. It was decided not to use the LFS data because the samples of immigrants from each origin country were extremely small, which could potentially lead to large errors in the estimated migration rates. Data from the IPS are used instead; these measure actual flows. However, these data are also subject to several caveats. As they are based on survey information, the standard errors corresponding to the estimated migration rates are high for some of the origin regions. More importantly, the data do not contain information on migration rates from the AC-10 countries, or even groups of countries closer to the AC-10 in social, cultural and economic terms than the historical origin countries of immigrants to the UK.

The fact that migration rates for the AC-10 were not available implies that the forecasting exercise, which uses parameters estimated for the available sample of countries, will rely on the assumptions of invariance not only across time but also across countries. This is a very strong assumption, meaning that migration decisions of individuals from the AC-10 during the years 2000 to 2010[38] will respond to the same factors and in the same way as the decisions of individuals from the origin regions during the years 1975-2000[39].

The set of origin countries used for the UK includes Canada, South Africa, Australia/New Zealand, other African Commonwealth countries (Botswana, Gambia, Ghana, Kenya, Nigeria, Sierra Leone, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe), Caribbean Commonwealth countries, the US, Rest of America, Middle East (Bahrain, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Omar, Qatar, Saudi Arabia, Syria, United Arab Emirates and Yemen) and India/Sri Lanka/Bangladesh/Pakistan for the 26-year time period from 1975 to 2000. Consequently, there are 234 observations in the dataset for the UK.

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[37] Home Office administrative data as published in the 'Control of Immigration: Statistics' series only covers gross inflows.
[38] The data reaches until 2000, and extrapolation begins from then onwards. We do not have any data between 2000 and 2004. However, significant changes to the forecasts would not be expected if the extrapolation was done from 2004 onwards.
[39] See discussion of invariance assumptions in Chapter 4.

For Germany, the origin countries are Austria, Belgium, Switzerland, Denmark, Spain, Finland, France, Greece, Italy, Yugoslavia, the Netherlands, Norway, Portugal, Sweden, Turkey, the UK and the US for a time period of 40 years between 1960 and 1999. The number of observations available for Germany is 680.

In Figure 6.1, the net immigration rates into the UK for the period 1975-1998 are displayed, distinguishing between Canada, Australia/New Zealand and the US and all other origin areas (South Africa, other African Commonwealth countries, Caribbean Commonwealth countries, Rest of America, Middle East and India/Sri Lanka/Bangladesh/Pakistan). The yearly net inflow rates from Canada, Australia and New Zealand and the US to the UK fluctuate over this period between -0.0002 per cent and 0.0015 per cent. There seems to be a slightly increasing trend. For the other origin regions, there is no visible trend. For these countries, the average net migration rate over this period is about 0.0002 per cent.

Figure 6.1. Net immigration rates to the UK. 1975-1998. Percentages. (see definition below)
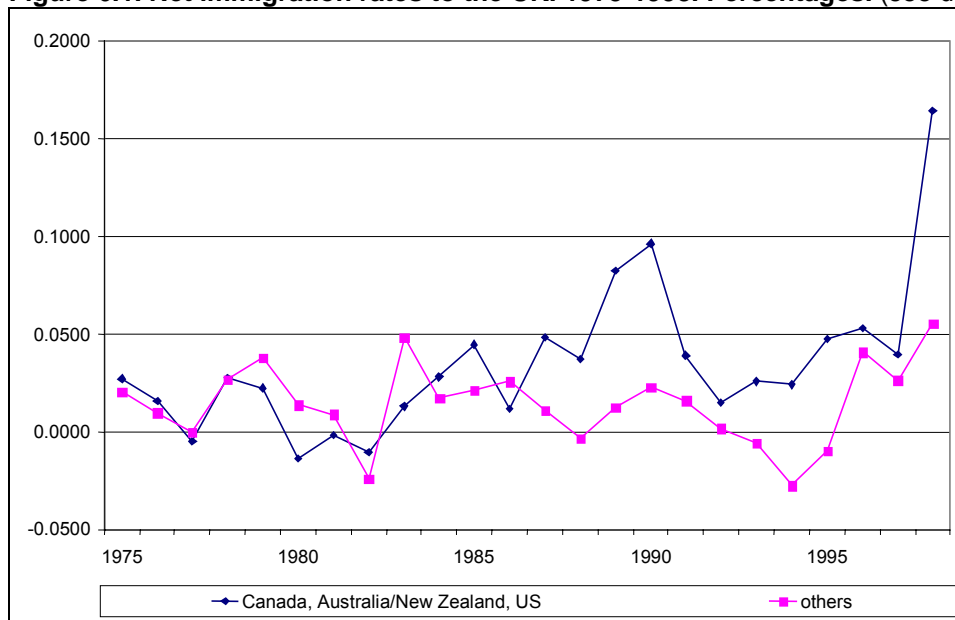

Source: International Passenger Survey.
Definition: Figures represent net emigration rate from origin country/region to the UK (inflow minus outflow) divided by total population in the origin country/region. Figures displayed in the graph are actual percentages multiplied by 100.

Figures 6.2 and 6.3 display average per capita GDP of the UK relative to the corresponding origin regions. It is clearly visible that in both cases relative per capita GDP deteriorates over the considered period, indicating that per capita GDP growth was higher in each of the two sets of origin countries than in the UK.

Figure 6.2. Relative pc GDP, UK / Canada, Australia and New Zealand, US. 1975-1998.
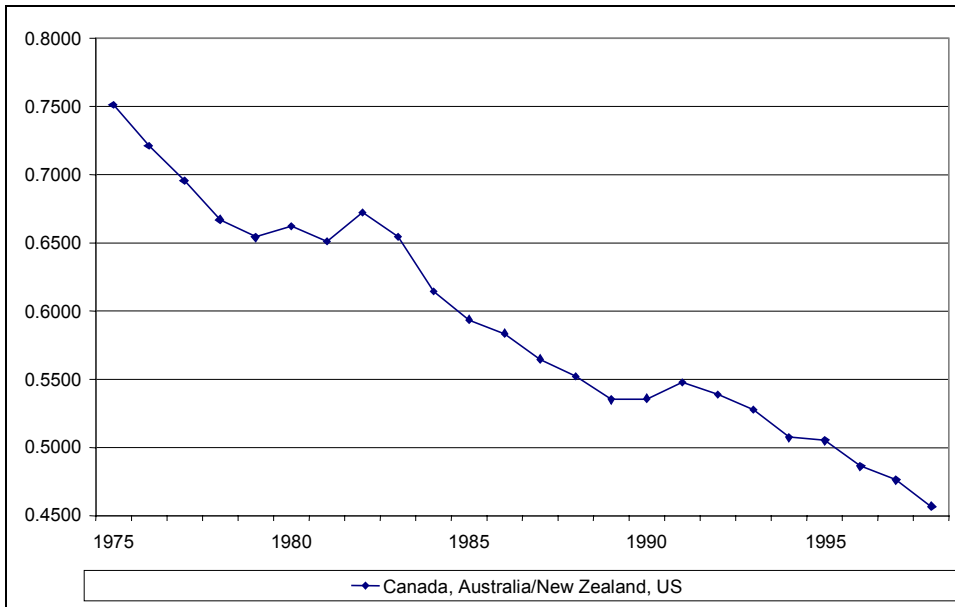
48

Source: Maddison (2001).
Definition: Relative per capita GDP is obtained by dividing per capita GDP in the UK by per capita GDP in the origin regions.

Figure 6.3. Relative pc GDP, UK / Others. 1975-1998
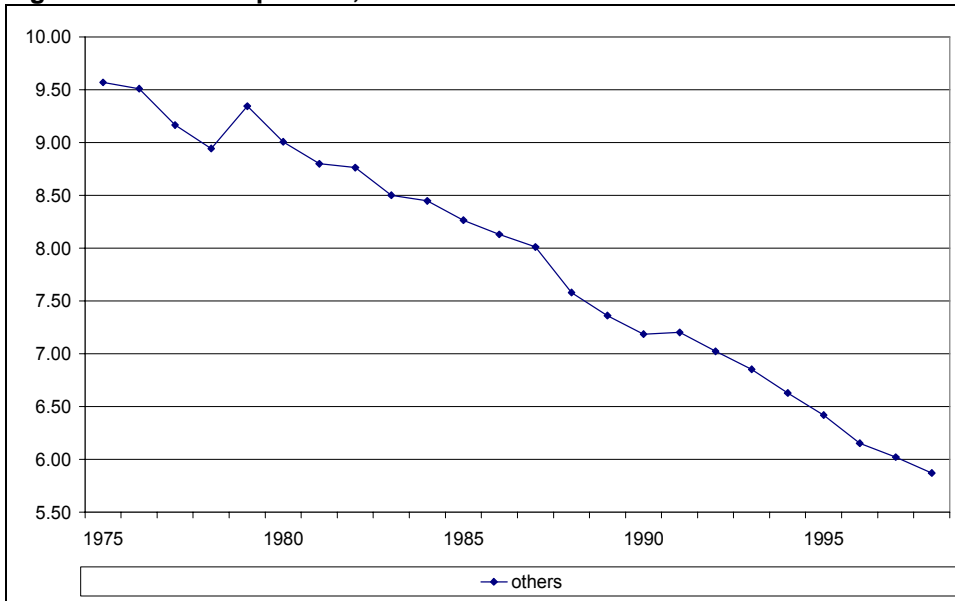
Source: Maddison (2001).
Definition: Relative per capita GDP is obtained by dividing per capita GDP in the UK by per capita GDP in the origin regions.

Theoretical model and alternative identification assumptions

The empirical application is now presented. A generic model of aggregate migration flows to two destination countries is formulated. Within this framework, it is possible to discuss a variety of identification assumptions and corresponding specifications of the model.

The simplest conceivable model of aggregate migration rates is formulated in terms of orthogonal country- and time-specific components, drawn from a common distribution of effects. In such a variance-components model (in a different context, a similar model is employed by Ashenfelter and Card, 1985), the net migration rate $m_{d,s,t}$ for origin country $s = 1,\ldots,S$, period $t = 1,\ldots,T$ and destination country $d = 1,2$ is specified as a linear function of an intercept term μ_d, a random component specific to country s and persistent over time $\varepsilon_{d,s}$, a component specific to time periods and relevant for all origin countries at each point in time $\varepsilon_{d,t}$, and an unpredictable white noise error term $\varepsilon_{d,s,t}$. The model absorbs the – slowly changing over time and difficult to predict – economic differences between origin and destination regions into region-specific factors and an autocorrelated error-component common to all origins.

In effect, we have:

$$m_{d,s,t} = \mu_d + \varepsilon_{d,s} + \varepsilon_{d,t} + \varepsilon_{d,s,t}. \quad (2)$$

The origin country-specific component $\varepsilon_{d,s}$ captures all aspects of the process determining migration from s to the respective destination country which tend to persist over time, such as a common (colonial) history, distance, a common language or border and also persistent economic differences. From this formulation it is possible to characterise the distribution from which the country-specific intercept terms are drawn. Knowledge of this distribution facilitates the necessary extrapolation from historical data to the desired forecasts. Given the maintained assumption of model stability (both across time and across countries), the intercept terms of those future migration countries for which no previous immigration record is available must be drawn from the same distribution. In order to obtain forecasts of net migration rates from the AC-10, it will be necessary to determine the location of these countries in the estimated distribution.

The period-specific component $\varepsilon_{d,t}$ reflects all determinants of migration activity which vary over time but operate in all origin countries identically during the same period. This would be the case for any fluctuation in economic activity in the respective destination country, for instance in aggregate labour demand. Even in this basic model, it would be unwise to exclude correlation of this factor across periods. Modelling the autocorrelation of this factor is therefore central to the application. This is the aspect of the model which deviates most visibly from a simple formation of historical averages. Specifically, this process is modelled as an autoregressive process of first order with parameter ρ.

Thus, the stochastic structure of the process described in (2) (remember that there is naturally no correlation across the variance components) is:

$$\varepsilon_{d,s} \sim (0, \sigma_{d,s}^2), \varepsilon_{d,t} \sim (0, \sigma_{d,t}^2, \rho) \text{ and } \varepsilon_{d,s,t} \sim (0, \sigma_{d,s,t}^2).$$

Starting from this basic model of variance components explanatory factors can easily be introduced. In effect, these explanatory variables parameterise the country-specific means to entail two principal components. One component is still capturing idiosyncratic but persistent forces generating country-specific migration intensities, while the other is derived as a linear combination of a country's factor means, with the regression coefficients as the respective weights. Furthermore, the time-varying components of the explanatory variables absorb some of the temporal fluctuation in migration rates and, thus, parameterise the temporal component of the error structure.

In principle, there is no limitation (other than data restrictions) to the number of explanatory factors which can be added to the basic model structure. Parsimonious models are favoured though, in order to avoid having to condition ultimate forecasts on a multitude of variables which

will have to be predicted in a preparatory stage. Experiments have been carried out with some specifications that use regressors like demographic structure and relative GDP, and these are discussed below.

In the empirical work, the baseline specification and its extensions using *Method of Moments* techniques are estimated. Intuitively, the idea behind the *Method of Moments* is estimating the unknown parameters by matching the theoretical population moments, which are functions of the unknown parameters, with the appropriate sample moments (Harris and Matyas, 1999). For a formal exposition see Appendix 2: Technical Appendix.

Model specifications

In a first set of estimations, the focus is on the variance-components structure described above. In the first specification, the overall net migration rate (the yearly net immigrant flow relative to the population at the origin) is modelled using the most parsimonious variance-components formulation, which comprises only orthogonal error components. In a second specification, the per capita incomes (in PPP) of the destination countries relative to those of the origin countries are used as regressors, parameterising the mean migration rate μ_d. The variance-components models for Germany and the UK are estimated independently from one another.

Specifications using the time-varying age structure in the various origin countries as an additional regressor have also been estimated, since this may be playing an important role for determining the origin countries' migration potential. Models have been estimated where the percentage of individuals in the age range 20 to 39 (the most likely cohort to emigrate) is included among the explanatory variables. For both Germany and the UK, this variable was insignificant in explaining historical migrations. Furthermore, results of these regressions were very volatile, due to the small variation in the age structure. This does not imply that demographic structure is not important for the migration potential of origin regions – it only indicates that for the historical migrations this variable was considered to have had no significant influence. The demographic age structure was therefore not used in the main analysis, nor was this specification used for forecasting purposes.

The shortcomings of the quantitative approach followed here in forecasting future migration potential should be emphasised again. Even the most parsimonious specification may result in misleading estimates. The dependent variable used for analysis is the net immigration flow to Germany or the UK relative to the population size of the respective origin country. These figures differ substantially for Germany and the UK. The reason is that the origin countries for immigration to the UK (like India, Pakistan, and the US) have very large populations, and migrants comprise only a small fraction of those populations. This results in small net migration rates. In contrast, Germany's origin countries have lower populations, and migration as a percentage of the origin countries' populations is in fact larger, resulting in higher migration rates. As a consequence, historical relative net immigration to Germany has been larger than to the UK. Any simple extrapolation (and the approach followed here and by others in this literature is not much more than that) would therefore lead to higher future migration rates to Germany than to the UK. This point will be mentioned again when the results of the analysis are discussed.

The following two specifications are estimated:

Specification 1: Variance-components model without any additional regressor (benchmark).
Specification 2: Variance-components model with GDP per capita in the destination country relative to that of the origin country as an additional regressor

Estimation results and forecasting scenarios

The aggregate-level determinants of historical net migration to Germany and to the UK are now estimated. Since neither Germany nor the UK share a common history of migration with the AC-10, these countries are ignored for the estimations. These estimates are then used to generate predictions of the immigration flows from the AC-10 following EU enlargement. In order to explore the robustness of the predictions two different specifications of the model are contrasted.

Parameter estimates

GMM estimation results for specifications are reported in Table 6.1 for the case of Germany and in Table 6.2 for the UK.

Table 6.1. Estimation results of variance components model for Germany.

Variable	Specification 1		Specification 2	
	Coeff.	t-value	Coeff.	t-value
Common intercept	0.0269	6.12	-0.0179	-2.04
Relative per capita income	-	-	0.0290	5.87
Variance of:				
Country-specific comp.	0.0049	4.42	0.00399	3.48
Time-specific component	0.0023	3.83	0.0024	4.01
Unsystematic component	0.0057	2.28	0.00569	2.24
Persistence parameter	0.6536	3.63	0.66020	3.75

The average net migration rate to Germany for the typical origin country during the sample period was approximately 0.027 per cent of its population per year. Around this average value, a substantial fluctuation across space and time with all variance components being estimated quite precisely was observed. The country-specific variance component is estimated to account for more than a third of the overall variation (recall that the overall variance is the sum of the individual variance components), despite allowing for persistence in the temporal error component. By contrast, the component of the variance which is common to all countries is estimated to be relatively small in magnitude. Yet, the large value of the autoregressive parameter indicates that any shock to aggregate migration activity typically has a long-lasting impact. Close inspection of the predicted values of the time-specific component over the sample period (not in the table) indicates that net migration activity to Germany was relatively low at the end of the 1990s.

Evaluated at the average relative GDP per capita of 1.55, Specification 2 also predicts an average net migration rate over all periods and all source countries of 0.027 percent. The estimation results indicate that net migration rates are higher the higher the difference in per capita GDP between Germany and the origin countries. The results indicate that a rise in relative per capita income of 0.1 (i.e. a ten per cent difference in terms of German per capita incomes) will typically lead to an increase in the net migration rate of approximately 0.003 percent.

Table 6.2. Estimation results of variance components model for the UK.

Variable	Specification 1		Specification 2	
	Coeff.	t-value	Coeff.	t-value
Common intercept	0.00641	5.93	0.0089	6.79
Relative per capita income	-	-	-0.0005	-3.36
Variance of:				
Country-specific comp.	0.00010	3.93	0.00012	2.95
Time-specific component	0.00002	0.91	0.00002	0.78
Unsystematic component	0.00015	1.57	0.00012	1.21
Persistence parameter	0.49852	0.58	0.43010	0.33

Table 6.2 shows that the average net migration rate to the UK is only 0.006 per cent of the population of the typical origin country. The reasons for this low rate have been discussed above – one of them is that some of the source countries considered, such as India and Pakistan, are enormously populous, with only very small fractions of the population emigrating to the UK. Furthermore, there is a relatively small variation of emigration activity across countries and especially over time. In particular, the estimate of the temporal persistence parameter of aggregate migration flows to the UK is not statistically significant. Finally, according to these estimates relative per capita incomes exhibit a statistically significant *negative* impact on observed migration flows. That is, the higher the per capita income of the UK relative to that of the origin country the *smaller* are observed migration rates. This is driven by a decrease in relative GDP between the UK and the origin countries (see Figures 6.2 and 6.3) that took place at the same time as an increase in relative immigration rates from these countries (see Figure 6.1).

Models with different GDP coefficients have been estimated for Canada, Australia/New Zealand and the US and the remaining countries. In these specifications, the GDP coefficient becomes strongly negative for the former set of countries albeit insignificant for the latter one. This specification is therefore not used for the predictions below.

Other specifications

Models with country-specific fixed effects included as regressors have also been estimated. This specification relaxes the assumption of orthogonality between country effects and regressors which was implicit in the variance-components models. Results of this estimation for Germany are reported in Table 6.3.

The same exercise was carried out for the UK (results not reported), but it resulted in very volatile estimates. This is not a surprise in the light of the available data, nor is it critical to our analysis. The forecasts for immigration to the UK will rest on the random effects analysis, as far as any free-mobility scenario is concerned.

Results for Specification 1 in Table 6.3 basically agree with the variance-components results in Table 6.1, displaying an average emigration rate to Germany of around 0.027 per cent of the population of a typical origin country. In Specification 2, relative per capita income is added as a regressor, and estimates of the corresponding coefficient indicate that it is a significant explanatory factor. It is important to note that the parameter estimate of per capita income has increased substantially, compared to that reported in Table 6.1. The reason is that, as mentioned above, specifications where country-specific effects are considered to be random assume

orthogonality between these effects and other regressors such as relative per capita GDP. If this assumption is invalid, then the coefficients on relative per capita GDP are likely to be biased in a random effects specification. The estimates indicate that this is the case. The fact that the GDP coefficient increases in the fixed-effects specification suggests that those countries which have a high emigration tendency (large country effect) are at the same time characterised by relatively small per capita differences with the destination country.

Table 6.3. Estimated results for model with country dummies – Germany.

Variable	Specification 1		Specification 2	
	Coeff.	t-value	Coeff.	t-value
Relative per capita income	-	-	0.17	6.58
Austria	0.073	1.98	-0.13	-2.64
Belgium	0.011	0.31	-0.19	-4.08
Switzerland	0.023	0.64	-0.12	-2.84
Denmark	0.002	0.07	-0.15	-3.56
Spain	0.016	0.45	-0.28	-4.89
Finland	0.008	0.22	-0.22	-4.42
France	-0.021	-0.60	-0.19	-4.39
Greece	0.057	1.60	-0.28	-4.51
Italy	0.054	1.53	-0.16	-3.38
Yugoslavia	0.091	2.55	-0.54	-5.29
Netherlands	0.025	0.70	-0.13	-2.99
Norway	0.010	0.27	-0.17	-3.78
Portugal	0.023	0.64	-0.33	-5.15
Sweden	0.017	0.47	-0.17	-3.73
Turkey	0.063	1.78	-0.73	-5.82
UK	0.011	0.31	-0.19	-4.02
US	0.002	0.07	-0.14	-3.22
Persistence Parameter	0.678	24.01	0.69	24.74

Forecasting Scenarios

The approach used identifies the overall population size in the AC-10 and the relative per capita income of these countries as the principal driving forces of future migration to Germany and the UK. To predict future net migration flows, the projected population size for each country for all years in the forecasting period is therefore needed. The projection is obtained using detailed population accounting imputation. Unfortunately - although without any significant consequences to be expected from this caveat - data on the detailed age structure of all AC-10 countries are not available. Therefore, it is necessary to proceed in two steps.

In a first step the current age structure of the Czech Republic, Estonia, Hungary and Poland (henceforth CEEC-4), those accession countries for which the most detailed population information is available, are considered. Detailed population projections for these countries are constructed, year by year. This is done imputing, for each year, appropriate age-specific mortality and fertility rates. Specifically, these demographic projections are constructed using the German life-table of 1970/72, ignoring any loss of population due to emigration. It is assumed that reproduction rates in the CEEC-4 do not differ substantially from that observed for a typical cohort of post-WWII German women, the cohort born in 1936, which started its reproduction around 1950 and continued up to approximately 1984. These rates have been chosen deliberately as the benchmark rates for the accounting because they stem from a now developed economy in Western Europe at an earlier stage of its economic maturation, a stage which is in many aspects comparable to that the accession countries economies are in today.

In a second step, the demographic projections for the CEEC-4 are used to construct the appropriate demographic forecasts for all the AC-10. In particular, the *highest* average yearly growth rate of the overall population is chosen below as the benchmark for *all* AC-10. Resulting population figures, together with the predicted relative per capita GDP figure are reported in Tables A1 – A4 of Appendix 1.

In order to obtain migration forecasts using the variance-components framework, it is necessary to choose the likely location of each country-specific intercept in the distribution estimated earlier. Note that, since the AC-10 have no previous record of migration to Germany and the UK, the mean and variance of this distribution have been estimated using data corresponding to countries other than the AC-10. Therefore, the assumption that the distribution is invariant must be made, not only across time, but also across the countries for which migration data are available and the AC-10. To explore the impact of different invariance assumptions, we compare scenarios for the "typical" sending country with $\varepsilon_s = 0$ with a "high-emigration" sending country whose value of ε_s is one standard deviation above that of the typical country. This way of addressing the potential location of any future source country in the distribution of country intercepts specifically uses the random-effects specification for providing a quantitative assessment of the exact meaning of "high emigration". If the distribution of country effects were normal (a characteristic *not* imposed here), then less than 16 per cent of all countries in the universe of potential sending countries would exhibit more emigration activity than a "high emigration" country. Note that the comparison with the normal distribution is only for illustrative purposes. It has in no way been imposed on the data.

For the purpose of forecasting future net migration to Germany and the UK from the AC-10 after the EU enlargement, several scenarios are considered in order to provide a careful assessment of different potential developments. Two different regimes for the development of relative per-capita incomes are explored. In the first regime it is assumed that the AC-10 grow at an average annual rate of four per cent, whereas Germany and the UK display an average annual growth rate of per-capita income of two per cent only. This regime is called the *medium convergence* regime. In a second regime it is assumed that all countries, i.e. the AC-10 as well as Germany and the UK, display an average annual growth rate of per-capita incomes of two per cent. Clearly,

since there is *no convergence* in this second regime, higher immigration figures would be expected. Furthermore, for all scenarios which are described in detail below, the time-specific effect as well as the idiosyncratic effect are set to zero.

Thus, the following seven free-mobility scenarios are evaluated. Their illustration and interpretation concentrates on Germany, as the figures for the UK are quite moderate throughout.

1. **Baseline 01 ("typical sending countries")**: estimated parameters of Specification 1, Tables 6.1 and 6.2 with the country-specific random effects set to zero.

2. **Baseline 02 ("high emigration sending countries")**: estimated parameters of Specification 1, Tables 6.1 and 6.2 with the country-specific random effects set to one estimated standard error of the distribution of the country-specific random effects – here considerably higher forecasts are expected, as the country-specific intercepts are higher by 0.07 per cent of the source country population.

3. **Economic 01 ("typical sending country – medium convergence")**: estimated parameters of Specification 2, Table 6.1 with the country-specific random effect set to zero (conditioning information: *medium* convergence of relative per capita incomes of AC-10).

4. **Economic 02 ("typical sending country – no convergence")**: estimated parameters of Specification 2, Table 6.1 with the country-specific random effect set to zero (conditioning information: *no* convergence of relative per capita incomes of AC-10).

5. **Economic 03 ("high-emigration sending country – medium convergence")**: estimated parameters of Specification 2, Table 6.1 with the country-specific random effect set to one estimated standard error of the distribution of the country-specific random effects (conditioning information: *medium* convergence of relative per-capita incomes of AC-10).

6. **Economic 04 ("high-emigration sending country – no convergence")**: estimated parameters of Specification 2, Table 6.1 with the country-specific random effect set to one estimated standard error of the distribution of the country-specific random effects (conditioning information: *no* convergence of relative per capita incomes of AC-10).

7. **Economic 05 ("fixed effects – medium convergence")**: estimated parameters of Specification 2, Table 6.3 with country-specific fixed effects (conditioning information: *medium* convergence of relative per capita incomes of AC-10).

Relative per capita income is included as a regressor in five scenarios. However, since estimates for the UK resulted in negative GDP coefficients (for reasons discussed above) it is not considered appropriate to include these specifications in the simulations (when they are, forecasts for the UK change only slightly compared to the baseline specifications reported). It should also be noted that it is not at all clear whether the estimated coefficient derived from the historical data – at time periods when sending countries displayed substantial but not dramatic income gaps with respect to the receiving countries – is indeed transferable to the new situation. As explained, income gaps between the Western economies and the AC-10 are large, and in some cases greater than those between the Western economies and those of the countries included in the sample.

Table 6.4. Summary of forecasting scenarios, 2000-2010.

Scenario	Average annual net immigration from AC-10	
	Germany	UK
Baseline 01	20,459	4,872
Baseline 02	73,446	12,568
Economic 01	48,849	--
Economic 02	55,118	--
Economic 03	96,859	--
Economic 04	103,128	--
Economic 05	209,651	-

Since all of these scenarios are based on a rather high growth rate of the overall population in the AC-10, it seems safe to argue that these figures are predictions at the upper bound of potential immigration to Germany. The same argument applies to the scenarios for the UK, which predict an annual net inflow from around 5,000 to 13,000 individuals from all the AC-10 countries depending on the assumption regarding the country-specific error terms.

The predicted numbers are relatively small. Numbers for Germany increase for specification *Economic 05.* The reason is the larger estimate of per capita GDP in the fixed effects specifications, which leads to far larger predictions for the AC-10, as the difference between their per capita GDP and that of Germany is larger than the average in historical migrations to Germany.

The coefficients obtained for Germany are at the lower bound of the estimates reported in the literature reviewed in Chapter 4. Numbers for the UK are of a much smaller magnitude. As discussed above, this is due to the relatively small historical net immigration into the UK from origin countries relative to their population size which, when projected into the future, leads to small forecasts. The results for the UK reflect the problems raised by some of the assumptions underlying the approach used to predict migration flows, in particular the invariance assumptions discussed in Chapter 4. For example, if migration rates from the AC-10 differ substantially from the historical migration countries (and there are no data to check this), this would affect our projections. It is impossible to predict which way any such difference would lean. For instance, the historical migration countries to the UK are geographically more distant, but culturally (particularly linguistically) as well as historically much closer. The results, therefore, cannot be interpreted as either a lower or upper bound.

From Table 6.4, it is obvious that predictions of future migration flows from the AC-10 to both Germany and the UK are small. If Germany imposes a transition period for the free movement of workers, it is likely that only a small fraction of those who originally intended to migrate to Germany to work will decide to move to the UK instead. The data on migration intentions reviewed in Chapter 4 suggest that the UK is not a very popular migration destination, and that it ranks equally with some other European nations. Any figure chosen would be an *ad hoc* suggestion, but we would not think that more than one in three immigrants who had intended to migrate to work in Germany would instead migrate to the UK if Germany had a transition period for a limited period. This is based on differences in the historical links to the AC-10, language, distance, and suggestions from the intention analysis in Chapter 4. Given the fact that any restriction on the movement of labour within an enlarged EU would be temporary (as discussed above), potential immigrants also have the option of waiting for a relaxation of the restrictions instead of migrating to a less preferred country.

Specifications for alternative scenarios

Other specifications have been estimated. For the purpose of assessing the consequences of a border closure in Germany on immigration flows to the UK, an attempt was made to explain the variation in country-specific intercept terms for Germany in terms of time constant characteristics of the origin countries, like common language, common borders and distance. The idea is to explain variation in country specific effects by variation in these fixed components, and then use for predictions the corresponding values for the UK. However, none of these regressors could significantly explain variation in country-specific fixed effects, and the total variation they did explain was extremely low.

Conclusion

The forecasts indicate that net immigration from the AC-10 to the UK after the current enlargement of the EU will be relatively small, at between 5,000 and 13,000 immigrants per year up to 2010. However, these figures need to be interpreted with great caution due to the methodological problems pointed out at various stages in the report. The main problems are summarised again below.

A major shortcoming of the UK analysis is the lack of good data. The fact that no administrative figures on net migration to the UK are available means that survey data has to be used, which introduces a large potential error in the analysis.

The approach used does not explicitly model return migration and predictions are based on the assumption that the proportion of immigrants deciding to go back to their origin countries, as well as the return patterns, will be the same for the AC-10 countries as for the historical sending countries to the UK. However, this is a strong assumption, in particular given the strong indications that many East-West migrations will be temporary.

A further assumption implicit in the empirical analysis is that past migration flows have not been affected by particular regulations or institutional arrangements, and that migrations from the considered origin countries to potential destinations other than the UK remained stable during the years 1975-2000.

To minimise the standard errors associated with the estimates, the IPS only reports migration figures for a set of origin regions (approximately corresponding to the ones used as inputs in this analysis). Figures for the AC-10 are not available. This implies that the forecasts for future migration flows to the UK from the AC-10 (i.e. the second step of the empirical exercise) are based on estimation of the distribution of the parameters in model (2) using an entirely different set of sending countries. The predictions rely on the strong assumptions that the parameters describing the model are stable not only across time, but also across countries.

To sum up, even though the results do not seem implausible in the light of past studies, they should be evaluated with caution, and with due consideration of the limitations of the poor available data. It should be noted that the main problem, which is the absence of sufficient information about historical migrations from AC-10 countries to the UK (or to Germany for that matter), cannot be cured, even with a more complex econometric approach. There are no migrations from these countries to the UK or to Germany over a sufficiently long period to be used as a basis for estimation. Furthermore, any migrations there have been were generated under a different scenario than the one of free movement of labour that this report seeks to predict. Any study, no matter what approach it chooses, and on what data it is based, suffers from this serious caveat.

Finally, it should be noted that revised migration figures, resulting from the recent corrections of the IPS data (which have not been taken into account in the estimates), would hardly change the results for the UK, and if they did, they would reduce predicted net migration inflows (as migration outflows have been revised upwards, this results in even lower net historical migration inflows to the UK).

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Appendix 1

Table A1: Convergence of relative per capita incomes between Germany and the AC-10

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Cyprus	1.96	1.92	1.89	1.85	1.82	1.78	1.75	1.71	1.68	1.65	1.62
Czech Republic	2.54	2.49	2.44	2.39	2.35	2.30	2.26	2.21	2.17	2.13	2.09
Estonia	2.17	2.12	2.08	2.04	2.00	1.97	1.93	1.89	1.85	1.82	1.78
Hungary	3.39	3.32	3.26	3.19	3.13	3.07	3.01	2.96	2.90	2.84	2.79
Latvia	3.53	3.46	3.39	3.33	3.26	3.20	3.14	3.08	3.02	2.96	2.90
Lithuania	3.70	3.63	3.56	3.49	3.43	3.36	3.30	3.23	3.17	3.11	3.05
Malta	1.88	1.85	1.81	1.78	1.74	1.71	1.68	1.64	1.61	1.58	1.55
Poland	3.28	3.21	3.15	3.09	3.03	2.97	2.92	2.86	2.81	2.75	2.70
Slovakia	2.83	2.77	2.72	2.67	2.62	2.57	2.52	2.47	2.42	2.37	2.33
Slovenia	2.41	2.36	2.32	2.27	2.23	2.18	2.14	2.10	2.06	2.02	1.98

Assumption: Average yearly growth rate of 2% for Germany and 4% for all other countries.

Table A2: Convergence of relative per capita incomes between the UK and the AC-10

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Cyprus	1.74	1.71	1.67	1.64	1.61	1.58	1.55	1.52	1.49	1.46	1.43
Czech Republic	2.25	2.21	2.16	2.12	2.08	2.04	2.00	1.96	1.93	1.89	1.85
Estonia	1.92	1.88	1.85	1.81	1.78	1.74	1.71	1.68	1.64	1.61	1.58
Hungary	3.00	2.94	2.89	2.83	2.78	2.72	2.67	2.62	2.57	2.52	2.47
Latvia	3.13	3.07	3.01	2.95	2.89	2.84	2.78	2.73	2.68	2.63	2.57
Lithuania	3.28	3.22	3.16	3.10	3.04	2.98	2.92	2.87	2.81	2.76	2.70
Malta	1.67	1.64	1.61	1.57	1.54	1.51	1.49	1.46	1.43	1.40	1.37
Poland	2.91	2.85	2.80	2.74	2.69	2.64	2.59	2.54	2.49	2.44	2.39
Slovakia	2.51	2.46	2.41	2.36	2.32	2.27	2.23	2.19	2.15	2.10	2.06
Slovenia	2.13	2.09	2.05	2.01	1.97	1.94	1.90	1.86	1.83	1.79	1.76

Assumption: Average yearly growth rate of 2% for the UK and 4% for all other countries.

Table A3: Population growth of AC-10

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Cyprus	754,967	756,707	758,450	760,198	761,949	763,705	765,464	767,228	768,996	770,768	772,544
Czech Republic	10,337,092	10,360,909	10,384,782	10,408,709	10,432,692	10,456,729	10,480,822	10,504,971	10,529,175	10,553,435	10,577,751
Estonia	1,572,885	1,576,509	1,580,142	1,583,782	1,587,432	1,591,089	1,594,755	1,598,430	1,602,112	1,605,804	1,609,504
Hungary	10,422,687	10,446,702	10,470,772	10,494,897	10,519,078	10,543,315	10,567,608	10,591,956	10,616,361	10,640,822	10,665,339
Latvia	2,678,869	2,685,041	2,691,228	2,697,429	2,703,644	2,709,873	2,716,117	2,722,375	2,728,648	2,734,935	2,741,236
Lithuania	3,503,085	3,511,157	3,519,247	3,527,355	3,535,482	3,543,628	3,551,793	3,559,977	3,568,179	3,576,401	3,584,641
Malta	393,477	394,384	395,292	396,203	397,116	398,031	398,948	399,867	400,789	401,712	402,638
Poland	38,053,393	38,141,071	38,228,951	38,317,034	38,405,319	38,493,808	38,582,501	38,671,398	38,760,500	38,849,807	38,939,320
Slovakia	5,418,264	5,430,748	5,443,261	5,455,803	5,468,373	5,480,973	5,493,602	5,506,259	5,518,946	5,531,662	5,544,408
Slovenia	1,999,454	2,004,061	2,008,678	2,013,307	2,017,945	2,022,595	2,027,255	2,031,926	2,036,608	2,041,300	2,046,004

Assumption: Average yearly growth rate of 0.23% for all countries.

Table A4: Growth of core-age population share in AC-10

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Cyprus	32.53	32.55	32.57	32.59	32.60	32.62	32.64	32.66	32.67	32.69	32.71
Czech Republic	29.43	29.45	29.46	29.48	29.49	29.51	29.52	29.54	29.56	29.57	29.59
Estonia	29.33	29.35	29.36	29.38	29.39	29.41	29.42	29.44	29.46	29.47	29.49
Hungary	28.23	28.24	28.26	28.27	28.29	28.30	28.32	28.33	28.35	28.36	28.38
Latvia	29.23	29.25	29.26	29.28	29.29	29.31	29.32	29.34	29.36	29.37	29.39
Lithuania	28.73	28.75	28.76	28.78	28.79	28.81	28.82	28.84	28.85	28.87	28.88
Malta	26.83	26.84	26.86	26.87	26.89	26.90	26.91	26.93	26.94	26.96	26.97
Poland	31.23	31.25	31.27	31.28	31.30	31.32	31.33	31.35	31.37	31.38	31.40
Slovakia	30.93	30.95	30.97	30.98	31.00	31.01	31.03	31.05	31.06	31.08	31.10
Slovenia	30.23	30.25	30.26	30.28	30.30	30.31	30.33	30.34	30.36	30.38	30.39

Assumption: Average yearly growth rate of 0.05% for all countries.

Appendix 2: Technical Appendix

Method of Moments techniques are a powerful approach to the estimation of unknown population parameters in non-standard situations. In the application used in this report it is particularly the autocorrelation of the temporal error term which generates a somewhat unusual estimation problem. The fundamental intuition behind the *Method of Moments* approach is to match the observable sample moments to the corresponding population moments. Since the latter can be expressed as a function of the parameters to be estimated, one provides these estimates by solving the corresponding moment equations for the unknown parameters. Therefore, the first step in the GMM estimation is to define the moment conditions. It is the intention to estimate from the observed sample $\{m_{d,s,t}\,; d=1,2; s=1,...,S; t=1,...,T\}$ a ($px1$) vector θ^d of unknown parameters with true value θ^d_0. If $f(m_{d,s,t}\ m_{d,s',t'};\theta^d)$ denotes a continuous ($qx1$) vector function of θ and $E(f(m_{s,t,d}\ m_{d,s',t'};\theta^d))$ exists and is finite for all s, s', d, t, t' and θ, then $E(f(m_{d,s,t}\ m_{d,s',t'};\theta^d))=0$ are the so-called *moment conditions*.

In the application used in this report the vector of unknown parameters is $\theta=(\mu_d\ \sigma_{d,s}\ \sigma_{d,t}\ \rho\ \sigma_{d,s,t})'$, and the moment conditions are:

$$g_0: \quad E(m^d_{s,t}) = \mu_d$$

$$g_1: \quad Var(m^d_{s,t}) = \sigma^2_{d,s} + \sigma^2_{d,t} + \sigma^2_{d,s,t}$$

$$g_2: \quad Cov(m^d_{s,t}, m^d_{s,\tau}) = \sigma^2_{d,s} + \rho^{|t-\tau|}\sigma^2_{d,t}$$

$$g_3: \quad Cov(m^d_{s,t}, m^d_{s',\tau}) = \rho^{|t-\tau|}\sigma^2_{d,t} \quad for\ s \neq s'$$

$$g_4: \quad Cov(m^d_{s,t}, m^d_{s',t}) = \sigma^2_{d,t} \quad for\ s \neq s'$$

The moment conditions g_2 and g_3 imply that the covariance of migration rates over time jointly reflects country-specific variation and persistence of the process. If one restricted ρ to zero, all this covariance would be attributed to country-specific effects.

Let $u_{d,s,t} =f(m_{s,d,t},m_{s',d,t};\theta^d_0)$ denote the *Method of Moments* disturbance and assume that $\{m_{d,s,t}\}$ is a stationary process. Let $f_{d,S,T}(\theta)=(ST)^{-1}\Sigma_s\Sigma_t\ f(m_{d,s,t}\ m_{d,s',t'};\theta^d)$ denote the sample moments corresponding to the moment conditions and define the criterion function $Q_{d,S,T}(\theta)= f_{d,S,T}(\theta)'A\ f_{d,S,T}(\theta)$, where A is a stochastic positive definite matrix. Then the *Generalised Method of Moments* (GMM) estimator of θ^d is $\hat{\theta}_{d,s,t} =argmin_\theta^d\ Q_{d,S,T}(\theta)$. Given a number of relatively innocuous assumptions the GMM estimator is weakly consistent and asymptotically normally distributed. If the number of moment conditions is equal to the number of parameters to be estimated, the above system is exactly identified. Then the GMM estimator does not depend on the choice of the distance matrix A and collapses to the *Method of Moments* estimator.

However, if the system is over-identified, i.e. if $q>p$, different GMM estimators are obtained for different distance matrices. The choice of the distance matrix that results in an asymptotically efficient GMM estimator is the long-run covariance matrix V of the GMM disturbance $u_{d,s,t}$. Given this choice of the distance matrix $(ST)^{-1/2}(\theta_{d,S,T}-\theta^d_0)$ has an asymptotic normal distribution with mean zero and covariance matrix $(F'V^{-1}F)^{-1}$, where F denotes the matrix of derivatives of the moment conditions with respect to the parameters.

With a consistent estimator $\hat{V}$ for V in hand one will be able to obtain $\hat{\theta}^d$ by setting $A=\hat{V}^{-1}$. The resulting estimator is called the optimal or efficient GMM estimator given $f(m_{d,s,t}\ m_{d,s',t'};\theta^d)$. The estimated standard errors of this optimal GMM estimator are then obtained as the square roots of the diagonal elements of $(ST)^{-1}(F'_{d,S,T}\ \hat{V}^{-1}F_{d,S,T})^{-1}$. Furthermore, given the optimal choice of the weighting matrix the resulting value of the criterion function can be used as a test statistic for the detection of specification problems, since $(ST)^{-1}Q_{d,S,T}(\hat{\theta}^d)$ is asymptotically distributed as χ^2 with the number of over-identifying restrictions as the appropriate degrees of freedom. In our application, we estimate the long run covariance matrix V as a diagonal matrix using the empirical moments in the sample.

Appendix 3: Notes on the International Passenger Survey[40]

The International Passenger Survey (IPS) is the main source of international migration statistics for the UK. It is based on face-to-face interviews with a sample of passengers travelling via the principal airports, sea routes and the Channel Tunnel. The main sample was 263,000 interviews in 2000. Of these, approximately 1 per cent were migrant interviews. The survey is stratified to ensure that it is representative by model of travel, route and time of day.

Definitions

In the IPS, the internationally agreed definitions of an Immigrant and an Emigrant are used.

An *immigrant* is a person who has resided abroad for a year or more and has on entering declared the intention to reside in the UK for a year or more.

An *emigrant* is a person who has resided in the UK for a year or more and on leaving has declared the intention to reside abroad for a year or more.

These definitions do not coincide with the legal definitions used in the UK of a migrant as, for example, in the various Immigration Acts.

Weights

The interviews are grossed to total numbers using a complex weighting system. The information collected has a "weight" attached to it which reflects both the sampling interval and an allowance for passenger traffic not sampled, or omitted for various reasons.

The method of grossing the interviews to national estimates varies depending on the method of travel. For air traffic, the grossing factor or weight given to a contact is the product of the sampling interval and a factor to allow for shifts and traffic not sampled. For sea traffic, the weight is obtained more directly by dividing the total traffic on a route (figures obtained from shipping statistics) by the number of contacts. In both cases there are further adjustments to allow for non-response and incomplete interviews.

Problems with the IPS

- Sampling and non-sampling error, which can make the estimates for small categories unreliable.
- Figures based on intention to migrate which may, or may not, be realised.
- Some categories of travellers omitted from the survey, and it is possible that some of these will be migrants. (Travellers to and from the Irish Republic; travellers on unscheduled channel crossings in charter vessels and some short-haul sea traffic; people travelling on military or embassy business and their dependants).

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[40] Most of the information in Appendix 3: Notes on the International Passenger Survey comes from the annual reference volumes on migration published by the Office of Population Censuses and Surveys (on data for the years 1974-1993) and the Office for National Statistics (data for the years 1994-2000).

Sampling errors

The IPS is a sample survey, and is therefore subject to some uncertainty. Standard errors can be calculated for estimates from the IPS. The formula used to calculate standard errors is an approximation. Suppose one wishes to calculate the standard error of the estimate of the number of people with a given attribute, then

$$Estimate = \sum_{i=1}^{n} w_i$$

$$St\ error \approx \sqrt{\sum_{i=1}^{n} w_i^2}$$

where $\sum_{i=1}^{n}$ denotes summation over the set of contacts with the given attribute, and w_i is the weight attached to contact i. For the IPS the attribute we are concerned with is that of being a migrant.

The formula is an overestimate where the probability of a contact having the given attribute (being a migrant) becomes large. In the IPS this probability is usually small, and therefore the formula is a reasonable approximation. An exception to this is sampling at the Port Health Channel, where the probability of a contact being a migrant is about one-third.

A more serious form of bias arises because the formula assumes a simple random sample in each port. In reality, the IPS uses a two-stage design (that is, a sample of shifts within a port and then a sample of persons within each selected shift). This is more efficient in the use of interviewers but results in a sample which is clustered over time. This tends to increase the sampling variance of the estimates of population values. The errors quoted should therefore be thought of as lower bounds.

It should also be noted that the formula becomes unreliable when the number of contacts is small, say less than five.

As the variance of the difference between two variables is equal to the sum of their variance, the standard errors of the net IPS figures can be rather large.

Non-sampling errors

Some passengers approached in the IPS cannot or will not be interviewed. Non-response bias occurs when these passengers are different, in the characteristics that matter, to the whole sample.

Up to 1979 low levels of response were experienced for immigrants from the Indian sub-continent. Consequently corrections were made to the data to allow for this bias. The situation was greatly improved by the introduction of separate sampling arrangements at the Port Health Channel. The improvement was at least partly because interviewers can more easily enlist the help of relatives or interpreters to translate for contacts who do not speak English. Another reason for the recently improved overall response has been the introduction of schedules translated into certain Asian languages.

For most contacts identified by the IPS as migrants, the level of non-response is now very low for most characteristics (e.g. country of birth, 0.9% of inflows, 2.1% of outflows).

A further source of bias may arise from the "out of hours" flights which occur outside shift times at the main airports (those are not sampled), if they contain a different proportion of migrants from the sample flights (at least for some countries).

Response errors may arise from contacts deliberately concealing their migration intentions from the interviewers. In addition, the question regarding length of stay is based on intentions for the future and not actual behaviour. Any discrepancy between the number intending to migrate but subsequently staying for less than a year, and those not intending to migrate but staying for a year or more, would give rise to errors of measurement.

Asylum seekers and other visitor switchers[41]

While the IPS identifies persons (excluding asylum seekers) intending to migrate for a year or longer, it cannot identify those migrants that actually return within the year or persons entering or leaving with the intention of a short stay but who actually stay for a year or longer. Therefore Home Office estimates of asylum seekers and other visitor switchers need to be added to the estimates that are derived from the IPS.

These data can be divided into three groups: port asylum seekers, in-country asylum seekers and other visitor switchers.

Port asylum seekers

It was thought initially that the IPS covered port asylum seekers. However investigations have shown that the IPS data included very few contacts who stated 'seeking asylum' when asked their reason for entry. The Immigration Service explained that while most port asylum seekers would cross the IPS counting line to retrieve their baggage, they would be escorted, so contact with anyone else would be actively discouraged. They would be returned to the examination area for processing and subsequently leave the airport by another route. Therefore the estimate of these migrants is made by making an allowance for the fact that some do not stay for a year or longer and hence are not migrants, and that some are included in the IPS.

In-country asylum seekers

The Home Office is able to estimate this group of migrants using asylum data. Again, allowance is made for the fact that some do not stay for a year or longer, or were likely to have initially entered the country for a year or longer and therefore should not be included again.

Other visitor switchers

These are those migrants who state on arrival that they intend to stay for less than a year but their intentions change and they are granted an extension of stay, for example as students or on the basis of marriage, resulting in a total stay of a year or longer. Estimates of non-EEA national visitor switchers are made from the Home Office database of after-entry applications to remain in the UK. It is assumed that the information about planned duration of stay given to the IPS interviewer is the same as that given to the Immigration Officer. Some visitor switching cannot be estimated. This includes the switching by EEA nationals. Data on this group are not available as the free movement provisions of EU law cover such persons. In general there is no information

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[41] Note that the corrections mentioned below are only made to aggregate data, not to data by country of origin.

about outward visitor switching to the US, other Commonwealth countries and EEA. It is assumed that the net effect of visitor switching to and from these countries is zero. For countries other than the US, old Commonwealth and EEA countries, an adjustment is made in respect of people coming to the UK but not for outward visitor switchers. This is because it is assumed that people emigrating from the UK to those countries return home to settle their affairs and then leave as a migrant.