



Home Office

Sizing the illegally resident population in the UK

2nd Edition

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Home Office Online Report 58/04

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Executive summary

The aim of this study was to review methodologies that have been, or are currently being, used in different countries within and beyond Europe to estimate the *stock* of illegally resident persons, followed by an assessment of their applicability to the UK situation.

The study is based on four phases of research. The first phase of the study draws on the Delaunay and Tapinos (1998) study to review existing studies and potential data sources used in European countries. The second phase discusses more recent attempts made in various countries to calculate the size of their illegally resident population. The third phase examines the use of regularisation programmes that have been and are being carried out in several European states. The final phase assesses the applicability of the findings and methodologies to the UK situation.

Overall it was possible to review 28 studies in 15 countries and assess their methodologies. Countries included the US, Italy, The Netherlands, France, Greece, Portugal, Germany, Spain, Czech Republic, Morocco, Tunisia, Switzerland, Belgium, Costa Rica and South Africa. None of the methods gives results with which we can be fully confident and several of them are little more than speculative.

A range of methods has been used, some attempting direct measurements, others indirect. Several methods involve comparisons of sources, usually some kind of register and a population census. Direct methods tend to involve special surveys, normally of employers. In most cases subsequent verification of the estimates derived is either difficult or impossible.

Most of the methods discussed are either not applicable in the UK or the results produced are not accurate enough. The method that may have potential appears to be the residual method, as applied in the US. It may be possible to apply this in the UK, based on a comparison of the 1991 and 2001 census results and on estimates of the numbers of immigrants and emigrants in the various categories. Developmental work is required before it can be ascertained whether the method is actually feasible in the UK.

The use of regularisation data from other countries may be used to provide an indirect comparative method. Amnesty programmes to regularise illegal populations have been carried out in several countries and the number of people coming forward provides a minimum estimate of those living or working illegally at the time of the amnesty. Sixteen regularisation programmes in Europe and North America have been reviewed.

1. Introduction

In recent years illegal immigration has become one of the major issues in the global debate on asylum and immigration. Due to its clandestine nature, the actual scale and dimension of illegal migration can only be roughly estimated (Futo and Tass, 2001). This project investigates the methods used by a range of countries to measure and/or estimate the size or their illegally resident population.

Aims and objectives

The aim of this study was to produce a threefold review and analysis of methodologies that have been, or are currently being, used in different countries within and beyond Europe to estimate the *stock* of illegally resident persons, followed by an assessment of their applicability to the UK.

Stocks of illegally resident persons comprise both the net cumulative flows of people who have entered without authorisation and are not regularised and those who have entered legally but have lost their right of residence and are still in the country (Tapinos, 2000).

Methodology

The study is based on four phases of research. The first phase of the study reviews existing studies and potential data sources used in other countries as discussed by Delaunay and Tapinos (1998). The second phase analyses current and recent attempts that are being made in various countries to calculate the size of the illegally resident population. Extensive literature and web-based research was carried out and government agencies and academic institutes were contacted to find out what methodologies and datasets are currently being employed and whether there have been any follow-up studies to those reviewed in Delaunay and Tapinos (1998). The third phase examines the use of regularisation programmes that have been and are being carried out in several European states. The final phase assesses the applicability of the findings to the UK situation. The fieldwork finished in Spring 2002, and is therefore based on data available at that time, though there may be other work undertaken since this report was written which could not be reported here.

Definitions

Throughout the report the terms illegal immigrant, undocumented immigrant, illegal alien and illegally resident population are used interchangeably as they are in the literature consulted. There is debate over the applicability of these various definitions, much of which focuses on the connotations associated with the terms 'illegal' and 'undocumented'; the latter prefix is thought to be more neutral and thus preferential (Bean *et al.*, 2001; Van Hook and Bean, 1998; Keely, 1977).

This report focuses on the *illegally resident population*, the stock of illegal foreign migrants present at any one moment. This differs from the number of *illegal entrants*, the inflow of illegal migrants over time. The illegally resident population is composed of the following categories:

1. Migrants who entered the country legally but subsequently fell into illegal status because of permit expiry.
2. Migrants who entered illegally, have no residence permit and remain illegally.
3. Migrants who entered illegally but then legalised either through regularisation or adjustment of status through marriage (Tapinos, 1999).

Structure of the report

The findings of this study are presented in the following five chapters. Chapter 2 reviews the key methodologies that have been or could be used to estimate the size of illegally resident foreign populations in other countries.

The three phases of detailed analysis of tested and conceived methodologies to estimate the size of illegally resident populations are presented in Chapters 3, 4 and 5. Chapter 3 reviews the methodologies used in Europe as discussed by Delaunay and Tapinos. It systematically details country case studies, outlining the aims, methods, data used and applicability of the method to the UK. Chapter 4 reviews what current attempts are being made in various countries to calculate the size of the illegal population; each method is discussed in detail and the strengths, weaknesses and applicability to the UK are assessed. Chapter 5 analyses the use of regularisation programmes in several European countries as a data source for estimating the stock of illegally resident foreign persons.

Finally, Chapter 6 examines the applicability to the UK of the findings related to other countries and will assess the possibility of employing them in the UK.

2. Summary of data sources and methodologies

Introduction

In order to estimate the stock of illegal migrants, researchers have developed various estimation methods. Hypothetical calculations are made which rely on measurable indicators of illegal migration using a conceptual or quantitative model (Futo and Tass, 2001). Using these estimates researchers have extrapolated the volume of the illegally resident population in the country being studied.

This chapter will summarise some of the key methodologies and data sources that have been or could be used to estimate the size of illegally resident foreign populations. These methods will be discussed in the context of country studies in Chapters 3 and 4 of this report.

Problems of measurement

By definition, illegal immigration eludes registration and statistical coverage (Tapinos, 1999). Measuring or, more precisely, estimating the numbers of illegally resident persons in a country is a task made extremely difficult by the unrecorded nature of the phenomena, by the problems of the data that are recorded and the different definitions, data sources, collection methods and legislative differences between countries (Clarke, 2000). The dynamism and fluctuation in the size of the illegal population is as much related to the intricacies of immigration law as to the movements of the migrants themselves.

Data sources

Any attempt to measure this complex population is based on the simple principle that those people who are resident illegally will at some point manifest their identity in a researchable form. Due to the clandestine nature of the illegally resident population, all data types are substantially uncertain (Futo and Tass, 2001, Delaunay and Tapinos, 1998). Futo and Tass (2001) identified four root causes for the lack of data on illegal immigration.

- First, data collection on illegal migrants faces the problem of identifying and counting those people who have intentionally made themselves unobservable. Even apprehended illegal migrants will hide important personal data on their status to avoid removal.
- Second, information and data that may establish a person's illegal status are frequently dispersed between different agencies such as government departments, the police, employment offices etc., making co-operation and access to data difficult.
- Third, legal problems may also prohibit the counting of cases; for example, in some countries illegal entry itself is not a criminal offence, therefore criminal statistics may not sufficiently cover the phenomenon.
- Fourth, country-specific legislation and definitions on legality and illegality result in a lack of internationally comparable data on illegal immigration.

Data sources – a typology

Delaunay and Tapinos (1998) produced the most comprehensive review of existing studies into measuring the size of the illegal population (the findings of their study are discussed in detail in Chapter 3). They proposed a typology of data sources used in sizing illegal migrant populations. A distinction was made between indirect and direct methods.

Direct measurement

Administrative statistics

Files from government administrative bodies, including information on refusals for entry visas, work and residence visas and rejected asylum seekers, can be used as data sources to indicate potential illegal migrants. Data from police checks and apprehensions or labour inspections might also be useful.

Regularisation statistics

An amnesty allowing illegally resident persons to regularise their status is one of the main data sources used as an indicator of numbers of illegally resident persons (Clarke, 2000). Regularisation programmes have been carried out in several European states and the US; for further analysis see Chapter 5. These results are limited by the fact that many programmes only target certain sectors and occur infrequently, and by the fact that once the process is complete, new illegal migrants are likely to replace them (Garson, 1999).

Special surveys

Many research projects are based on specially designed surveys using representative samples. Surveys are frequently on illegal employment or could be longitudinal with the aim of creating statistical biographies of migrants.

Indirect estimates

Comparison of sources - population statistics

The comparison of different population censuses and registers can highlight the real populations of migrant-sending and receiving countries. Data can support hypotheses on migration and expected populations. A method that is widely used measures the sex ratio of the sending country that would have resulted in the absence of migration, the assumption being that there are likely to be more male than female irregular migrants.

Inferences from secondary events

Statistics collected on secondary events provide an indirect source for calculating numbers of illegal migrants. Data on common crimes, births, deaths, education, social services, health and employment may record the visible manifestations of involvement of illegal migrants in society. These data are in many cases of limited use as the processing of the information is frequently unpredictable and they are rarely published.

Some implications for the UK

The potential of UK data sources for estimating the size of the illegal population was discussed in Salt (1998). There is a lack of embarkation records to allow the matching of inflow and outflow data on individuals; there have been no large-scale regularisations and special surveys have been small-scale and piecemeal. The best indicator of the extent of illegal migration comes from the enforcement statistics, although these are not comprehensive enough to sustain attempts to estimate the scale of irregular migration.

Methods of estimating the stock of illegal immigrants

Methods to measure or estimate the *stock* of illegally resident persons can be divided into those that make calculations either directly or indirectly. In addition to those discussed in this report, other methods use direct and indirect measurement to identify illegal *flows*.

Direct methods attempt to count the number of illegal persons present. However, because the illegally resident population is statistically hidden, the results from such methods will at best provide an incomplete picture (Tapinos, 1999).

To gain a more realistic estimate it is necessary to use *indirect* methods, which can be used to produce an inferred value for the illegally resident stock. This is often based on the premise

that the presence of an illegally resident person will be recorded in some way during their period of residency. This may be through police records, employment records or, for example, those 'lost' in the asylum backlog process. Additionally, indirect methods include residual estimations that use demographic formulae to analyse a mixture of census and survey data. Table 2.1 summarises the various methods:

Table 2.1: Indirect and direct methods of estimating the size of the illegal population

Direct	Indirect
<ul style="list-style-type: none"> ▪ Exception legalisation procedures ▪ Delphi method ▪ Sampling by snowball or plateau 	<ul style="list-style-type: none"> ▪ Linking of sources (population registers, censuses ...) ▪ General police statistics ▪ Civil registry office statistics (births, deaths etc.) ▪ Survey on irregular employment ▪ Sex-ratio by age of populations of origin and migrants counted

Source: Delaunay and Tapinos (1998)

Direct measurement

Some methods attempt to measure directly the illegal population using administrative statistics based on refusals, infractions or regularisations (for further discussion of regularisations see Chapter 5). In reality much of the population target will remain statistically hidden to such methods and the calculations will often relate to a *flow* rather than a *stock* figure. Alternatives to such techniques are the Delphi and snowball methods.

Delphi method

The Delphi method is subjective and is used in a wide range of research, educational and business fields. It aims to gather together and synthesise the perceptions of a group of people on one particular subject. This method is used to gain the distilled opinion of a number of different people. When used in the context of the illegally resident population the method provides a direct measurement, albeit one that is subjective and not statistically rigorous.

The use of this method is discussed in more detail with respect to measurement of illegal workers in the Swiss workplace; some general comments are presented here. The object of a Delphi exercise is to produce a result based on a consensus from an interested and knowledgeable group. In this case the consensus required is the stock of irregular migrants. The technique is particularly useful in forecasting or in assessing situations where other data are sparse or non-existent. The participants, who may be officials, employers or community representatives, are asked for their informed opinions on what the stock might be, based on the knowledge acquired in the course of their jobs. Estimates of the proportions of illegal entrants apprehended, of asylum seekers overstaying, of 'students' falsely enrolled and other groups might be requested. Normally a Delphi study requires a second round of questions in which respondents in the first round are sent the responses of all participants and asked if they wish to change their views. The output is a range of estimates of total numbers of irregular migrants and some indication of which groups are most frequently represented.

There are several difficulties in using the Delphi method. Those asked for an opinion may know only part of the situation; they may also be biased in their responses. Certain groups may be missed. In any case it is not easy to move from such a set of estimates to a consensus and then to an estimate of the total. On the other hand, careful selection of respondents with an intimate knowledge of particular groups can produce valuable information on the characteristics of those living in an illegal situation.

Snowball method

Snowball sampling is a direct method. Strictly speaking this is an indirect technique but aims to measure the illegal population directly. Snowball sampling is used when respondents from the sample population are particularly hard to locate, which is inherent to the illegal population. The snowball technique relies on referrals from initial contacts to supply additional contacts with good knowledge of the target population. The technique produces a wide range of contacts and information by a system of 'chain referral'; it serves to provide access to those persons who would otherwise be difficult to contact (Atkinson and Flint, 2001).

The snowball technique can be used in two different ways. First, it can be used in an informal manner to gain a general insight into a target population that would be otherwise inaccessible by conventional surveys. The system of chain referral provides a matrix of trust by which the researcher can gain access to and interview a hard-to-reach population. The informal snowball technique concentrates on interviews to gain a descriptive, qualitative result. This tends to provide a wealth of contacts and while mostly explorative in aims and generalist in its results, it does allow the researcher access to the research population. The second, more formal, technique aims to gain a quantitative figure from the same hard-to-reach population that has otherwise been difficult to enumerate. Each sampling 'unit' that is contacted provides information about themselves and also other 'units' that they are informed about. The analysis can then make statistical inferences about the size of the hidden population and has been used by Snijders and Frank (1994) to estimate the number of heroin users in Groningen and by Bieleman *et al.* (1993) to estimate the number of cocaine users in Rotterdam (Dávid and Snijders, forthcoming).

Snijders (1992, 1993) has two recommendations for the snowball method. The first is that the initial sample should be random. In practice, this is very hard to achieve with a hidden population; therefore, several separate starting sources are suggested to reduce bias. This may also be achieved by using a Bernoulli sample; this method allows the researcher to select individuals according to a procedure that independently selects those for the sample, although the nature of the hidden population will "preclude a perfect Bernoulli sampling procedure" (Snijders and Frank, 1994:66). The second recommendation is that to achieve a more accurate estimate the initial sample should not be smaller than the square root of the population size (Dávid and Snijders, forthcoming).

The snowball method is inherently biased, although steps may be taken to reduce the degree of bias. It may also exclude important contacts who are isolated from particular knowledge networks, or those who have been subjected to too many requests in the past and choose to ignore requests for information. Nevertheless, the method does supply good complementary information to other means of estimating hard-to-reach populations.

Indirect estimates

Indirect methods of calculating the illegal population can take three forms: comparative, inferential and economic. *Comparative* methods make use of different sources such as censuses or immigration, emigration and overstayer statistics. Others make estimates using *inferences* of secondary events such as sex-ratio data, police statistics or mortality and fertility records. Additionally, some methods make use of employment and/or *economic* data to calculate the number of illegally resident workers. Comparative methods that make use of residual techniques have been applied most extensively in the United States.

Comparative method – residual

The residual method makes use of census and immigration data. The census-enumerated figure for the foreign-born population is compared to that of the foreign-born population as calculated from each of its constituent immigration components. The equation below gives the details of the foreign-born population as calculated by using the immigration data.

Foreign-born = [*Legal immigrants* – (M+E)] + *Temporary migrants (legal)* + *Residual foreign-born*

M = Mortality to legal immigrants E = Emigration to legal immigrants

An analysis of the *residual foreign-born* component reveals that it has two separate constituents. The majority of the *residual foreign-born* are unauthorised to be in a country; they are the illegal migrant constituent. A proportion of these persons are quasi-legal (as defined in the US approach described in Chapter 4) in status, for example, they may be in an asylum backlog.

To calculate the implied illegal stock it is necessary to examine immigration and asylum statistics on backlog data and to subtract the quasi-legal migrant figure from the *residual foreign-born* figure.

Illegally resident stock = Residual foreign born - quasi-legal stock

This method is discussed in more detail in a later section of this report, with reference to the estimate made by the United States Census Bureau (2001).

Capture-recapture method

Originally developed to estimate the size of fish and animal populations in biological research, the capture-recapture method can also be used for human social research.

If two independent observations are made in an area at different times, an individual has the same probability of capture each time. The probability of actually being observed in both of these observations, however, is different. The method is applied as follows:

Suppose X people are captured and 'marked' and after some time y persons are then captured in the same area, and x appeared to be marked. On the principal assumption that the probability of capture is the same for both observations:

$$\frac{x}{y} = \frac{X}{Y}$$

We can then solve Y , the population size, by rearranging the equation to give:

$$Y = \frac{yX}{x}$$

In the case of illegal migrants, this assumes that those recaptured will be recognisable from police records. This method may also take into account a proportion of undercount in those recaptured because of emigration, immigration, births and deaths amongst the target population. This approach was used in The Netherlands, as described in Chapter 4.

Sex-ratio method

A calculation of the male sex-ratio in a sending country, by creating survival curves from a previous census, produces an expected sex-ratio for the population. A comparison of this *expected* population with contemporary *observed* populations in sending and receiving countries allows us to estimate the illegal migrant component. The method assumes that clandestine migrants are mainly men. It tries to find them by taking into consideration the sex-ratio of the populations which have been subject to census in the country of origin and the theoretical ratio of masculinity of the remaining people subjected to census both at home and abroad.

The discrepancies between the observations are at best a broad indication of the illegal population in a destination country because of the complexity of the migratory process and the inherent problems of calculating survival rates and of enumerating populations. For example, the dispersal pattern of migrants from the sending country is largely unknown and so a direct comparison of ratios is difficult. This may be overcome, in certain cases, by examining countries that have a good linked migration history such as Algerians to France. Additionally, there may be errors in differential mortality measurements or under-enumeration in censuses.

Employment and economic methods

Surveys of *employers* may indirectly reveal those foreign workers who are illegally resident in a host country. There are problems measuring the scale of illegal employment as a basis for calculating an illegal stock, for those employed illegally may not relate in magnitude to those who are illegally resident, or those who arrived on a clandestine basis. The method may also be aimed at determining the size of the informal economy and not specifically workers who are illegally resident. Estimates compare population registers and residence permit data to reveal those persons who are employed that have an expired residence permit, no permit, or a permit issued for reasons other than work. The method has to be used in conjunction with numerous other sources of data in order to generate estimates of the proportion of illegal working carried out by migrants.

Economic methods are based on the proviso that illegal residence is linked with illegal employment. Research has shown that by and large the illegally resident population does not account for the majority of the illegal workforce (Tapinos, 2000). Those methods that use a measure of the illegal economy to infer the size of the illegal population are not concerned with the status of migrant workers but with national fiscal issues such as taxation and GDP. Therefore it is difficult to estimate the size of the target population. The method makes a comparison between observed and assumed developments in the national accounts of a country. A calculation using national accounts has been made in Italy (Baldassarini, 2001).

Summary of methods

A summary review of the methods described above is provided by Delaunay and Tapinos. None of them provides a well-founded or rigorous method by which to measure the illegal population, while the Delphi technique has no statistical basis. Each method focuses on only one part of the phenomenon and only the work in the US goes some way towards providing a national estimate. The incompleteness is not only statistical but regulatory, with illegality being ill-defined, difficult to recognise and impossible to capture in figures. However, in so far as some of the methods provide profile information on the characteristics of some sub-groups, the results are valuable to policy makers.

An added complication is the confidentiality of micro-data, existing but not publicly available in enforcement statistics. Calculations have usually been based on aggregate statistics or indirect methods. Often the latter proceed by the calculation of a residue between the estimated global stocks of immigrants and the inaccurate inventory of those who are legally registered. Statistics which flow from an individual identification of the irregular situations, such as those of the police or from a regularisation procedure, can provide an invaluable supplement.

Finally, the duration of residence also has to be taken into account. Delaunay and Tapinos (1998) suggest that irregularity is a continuum, that methods should focus on the time dimension as well as number. This point is taken up in Chapter 5, where it is pointed out that the same individuals may apply for regularisation in successive amnesties, having already been given temporary legal status which has then run out.

3. Phase 1: Delaunay and Tapinos study

Introduction

This section will review existing literature on methodologies that have been conceived and tested to estimate the size of illegally resident populations. The review will detail country case studies, outlining the aims, methods, data used and applicability of the method to the UK. The review draws mainly on the work carried out in 1998 by Delaunay and Tapinos who produced a comparative research study of methodologies in nine European states.

Sizing the illegal population in Europe

In Europe, measurement of illegal migration and migrants has been attempted only relatively recently. Delaunay and Tapinos state clearly that “no method can supply a complete coverage of the stock of clandestines; the only imaginable exception would be a non-restrictive procedure of legalisation, whose exhaustivity is difficult to establish” (1998, p. 11).

Their study aimed to compile a register of methods used in a range of countries and to suggest viable procedures in the light of data limitations and availability. Their work identifies three kinds of clandestine action related to illegal migration: first, clandestine entry; second, clandestine residence; and third, clandestine work. This review of the study will focus on methodologies for sizing the illegally resident population. The methods identified in the study by Delaunay and Tapinos (1998) are summarised in Table 3.1 below.

Table 3.1: Tested or conceived methods to estimate clandestinity

From Tapinos (1999) based on Delaunay and Tapinos (1998)

	Europe	UK	Belgium	France	Greece	Netherlands	Italy	Portugal	Czech Rep.	Switzerland
Breaches of residence regulations										
Refusals of residence permits										
Refusals of political asylum										
Regularisations										
Common Law crimes										
Comparison of sources										
Deaths and births										
Expected populations										
Sex-ratio										
School, social assistance										
Delphi method										
Surveys by stage										

= Methods being applied
 = Collaborators' proposals

They include both methods that have been tested and those conceived to estimate the illegally resident populations in the nine study countries (UK, Belgium, France, Greece, The Netherlands, Italy, Portugal, Switzerland and the Czech Republic).

Country case studies

This section summarises the studies that were covered in the Delaunay and Tapinos (1998) study on a country-by-country basis. The summary is not exhaustive but will cover the best documented examples in the study where the methods have been tested. In each case the aims, methods, data used and applicability of the method to the UK will be outlined.

Morocco and Tunisia

Method and data

The method used was that of expected population, designed to estimate the size of the clandestine population of Moroccans and Tunisians in selected destinations. It produces estimates of the size of the population that has left the country and compares them with the numbers from that origin country at destination. Age-specific fertility and survival curves for selected age groups were applied to intercensal population change to calculate the scale of emigration. The estimated emigration figure was then compared to the size of stock of the two nationalities in selected destinations, any difference being a crude estimate of the scale of clandestine movement.

In the Moroccan case the study was taken a stage further by comparing the expected sex-ratio with that observed. In theory the difference should give an idea of the masculine (or feminine) over-population which has left the country. By comparing the sex-ratio of the population which left with that recorded for the Moroccan population at destination it should be possible to estimate the scale of the clandestine population.

Results

In the Moroccan case study the exercise was compromised by data problems and in the case of Tunisia the method failed completely. The results of the Moroccan exercise indicated 600-700,000 Moroccans living illegally in a group of six European countries (not including the UK).

Applicability to the UK

The studies revealed several intractable practical problems generally. Age data are problematic, especially for women, which means that estimates based on sex-ratios are dubious at best. Other difficulties include: the unknown dispersion of migrants outside Europe; immigrants residing legally in reception countries but omitted from official counts; and errors in the measurement of differential mortality.

The method would be difficult if not impossible to apply to the UK. It would require detailed demographic data for all the main sending countries, many of which would not be available with the level of accuracy (or at all) required. Within the UK, fertility and mortality registration data on foreign nationals are generally not available.

There are some possibilities, notably use of the Labour Force Survey in the UK to generate demographic variables, combined with the selection of particular origins where demographic statistics are thought to be sound. This might generate estimates for certain groups, although the work involved would be extensive.

Italy

Various attempts have been made in Italy to determine the number of irregular foreigners in the Italian population using methods including the comparison of data sources on the same segments of the foreign population, indirect methods based on data of events involving foreign citizens and reports of non-documentation based on direct questioning.

Comparison of census and residence permit registration - total foreign population

The comparison of sources method has been used in Italy in recent years in studies carried out by Natale (1986 and 1990), Casacchia (1987), Baldassarini and Freguja (1995). In most cases the method was used to estimate the total foreign population rather than the illegally resident population; therefore to estimate the illegal population a residual calculation is required.

Method and data

Casacchia (1987) produced an estimate of the total foreign population in 1984 on the basis of population census data, registration of residence permits and the number of foreign students in Italy in 1981. The researcher analysed the data for each region to highlight any distortions or differences in the data sources used. Casacchia chose to use the highest value obtained from either the residence permit data or the census data as the estimate of the foreign population for each region.

Choosing the maximum value increases the risk of recording errors as the value may omit large numbers of both illegal and legally resident foreign populations; therefore the method chosen underestimates the total number of aliens in the 1981 census. (Casacchia, 1987).

Results

On the basis of the minimum estimate for 1981 the author made an adjustment for 1984 and then extrapolated a result including illegally resident persons. The minimum estimate for 1981 was 360,695 and the extrapolated result for 1984 produced a total foreign population of 750,000 that was assumed to include a few illegal migrants.

Applicability to the UK

The estimate produced for the total foreign population was a 'minimum estimate' as it did not take into account the illegally resident population who evade registration. As it stands, the method could not be applied to the UK where population registration does not exist. However, the method as a whole is a variant of the residual method and could (in theory at least) be applied to the UK using 1991 and 2001 census data, together with various flow data. A more detailed assessment of the residual method is discussed later, in relation to the US.

Data on events - births and deaths

Method and data

Civil register events are used as a source of data as illegally resident foreign populations find it extremely difficult to avoid recording events such as births and deaths. Natale (1990) connected the rate of growth of the foreign population to the rate of growth in demographic events. He examined the increase in the foreign population's birth rate where at least one parent is foreign. The base year was 1971, which was assumed to have negligible illegal migration. Natale (1990) hypothesised that the growth in the foreign population would equal that of the growing birth rate of foreigners between 1984 and 1988.

Results

The annual birth-rate growth between 1984 and 1988 was 10.25 per cent. The final calculation produced a total foreign population of 857,100 in 1988, of which it was estimated 338,000 were illegally resident. Details of how this estimate was calculated were not supplied.

Applicability to the UK

The idea of using civil register events, mainly births and deaths, exploits the difficulty in western societies, even for those staying illegally, of concealing these vital events. As this method only includes birth and death data, it will not provide information about the mobile population. There are also other limitations. Births tend to occur in families, which are not usually in a majority among illegal populations; deaths affect few young adults who may be expected to be a substantial proportion of illegal migrants. When the foreign population from a particular origin country is low, vital events are rare and there is little likelihood of them being revealed.

Furthermore, the UK lacks vital registration data by nationality. Although some inferences might be generated from the Labour Force Survey or the Longitudinal Study, they would lack sufficient accuracy.

Measurement on the basis of casual labour – Delphi survey

Method and data

ISTAT (1991) proposed an estimate of the number of individuals involved in the irregular economy and of the total number of irregular foreign workers. Using the Delphi method, ISTAT regional offices contacted the heads of companies, members of associations and religious groups, union leaders and researchers in regional offices to establish an average ratio between regular and irregular workers.

This information was compared with national records of labour statistics to confirm their reliability and to highlight any regions where adjustment might be necessary. The estimated ratio was also compared to other statistics, such as an estimate of funds sent abroad by the Bank of Italy.

Results

ISTAT produced an estimate of 580,000 illegal workers in Italy and 85,000 legal non-EC foreign workers. The total foreign population was estimated to be 1,144,000. Delaunay and Tapinos note that errors are likely to be amplified as the figure is based on a chain of assumptions (these are discussed in the next chapter).

Applicability to the UK

The Delphi method could be applied to the UK. In reality, it would require a complex survey and assume that the actors identified had good enough knowledge of the ratio of regular/irregular workers. It would require further assumptions about the activity rates of the irregular population. The method could then be used to provide profiling information for selected groups or sectors.

Portugal

Two attempts have been made to measure the illegally resident population in Portugal. These were:

- based on the results of the 1981 census and the registers of the SEF (Foreigners and Borders Service) for that same year (Esteves, 1991); and
- based on a direct survey of some shanty areas of Lisbon (CPAC, 1995).

Comparison of census and SEF data

Method and data

The study compared the results of the 1981 census and the registers of the SEF (Foreigners and Borders Service) for that same year.

Results

Esteves found that the 1981 census recorded 108,526 foreign residents while the SEF recorded 62,692 legally resident foreigners. The author decided that the difference between the two figures would be used as a reliable estimation of the number of illegally resident foreigners in Portugal in 1981. Esteves acknowledged that it was possible that the numbers for some nationalities could have been exaggerated if respondents gave information on place of birth rather than citizenship.

The results of the 1991 census cast serious doubts over the reliability of these estimates as it became clear that there had been a failure to distinguish between place of birth and citizenship in a significant number of cases, grossly under-registering the real number of foreigners resident in Portugal.

Applicability to the UK

The method is based on a comparison of census and register data. The absence of a register in the UK means that such a matching is not possible. It also relies on assumptions about the accuracy of recording register data and the relationship between place of birth and citizenship.

Direct survey in Lisbon

Method and data

CPAC carried out a direct survey of selected shanty areas of Lisbon. The main purpose of the study was to estimate the numbers of African immigrants working and living in these areas (CPAC, 1995).

Results

No results were published in the country report for the Delaunay and Tapinos study. The CPAC direct survey of illegally resident foreigners in shanty areas of Lisbon has been criticised for being methodologically weak: first, because it did not cover the total foreign illegal population; and second, as it inferred a result for the total population without taking into account any of the specific characteristics that the observed population may have *vis-à-vis* the total illegal population.

Applicability to the UK

There is no UK equivalent of shanty towns although the method might be adapted to fit selected local housing areas. However, it would be difficult to identify these and determine a representative sample. The results of a detailed survey of sample areas might provide some useful information relating to those areas and their occupants, although it is doubtful if any methods could be found to extend the findings to the UK as a whole.

One problem in such a survey would be sensitivity of the population to the researchers and to the purpose of the study.

The Netherlands

Four major studies were reviewed in the case of The Netherlands, each adopting different methods to produce estimates of the stock of illegally resident foreigners. These include estimates of:

- illegal foreign employment;
- undocumented foreigners;
- the illegal foreign population in Rotterdam; and
- the illegal foreign population in the four main cities.

Illegal foreign employment - Delphi method

Method and data

Zandvliet and Gravesteijn-Ligthelm (1994) produced a partial estimate of the number of illegally employed foreigners using the Delphi method. Employers and employees in economic sectors well known for their use of illegal workers were asked to estimate the number employed within their own company and in the sector as a whole. To increase the response rate, the question was not asked overtly but was included in a more general survey on staffing problems and the employment of foreign workers.

The sectors included in the study were horticulture, clothing manufacture, processing industry, metal industry, construction contractors, catering and cleaning. The company estimates served as a lower limit of the extent of illegal foreign employment and sector estimates were used as a basis for the upper limit.

Results

Zandvliet and Gravesteyn-Ligthelm estimated that the size of illegal employment, for the sectors included in the study, amounted to a maximum of 25,000. These results were then generalised to estimate that illegal employment in all sectors would not exceed 0.5 per cent of total employment in The Netherlands. Non-response was minimised (although the level was not stated) by including questions on illegal employment in a more general survey.

Jonkeman-te Winkel (1994) suggested that the results produced by Zandvliet and Gravesteyn-Ligthelm (1994) underestimated the size of the illegal working population. In their opinion small firms are more likely to employ illegal workers. The authors argued that as they used the registers of the Chambers of Commerce to derive the sample of study companies, small firms may have been under-represented in the survey. In their opinion small firms are more likely to employ illegal workers.

Applicability to the UK

This method could be used in the UK in specific sectors. It would produce information on some of the characteristics of those working illegally. However, any similar study in the UK would need to be careful about the accuracy of responses and the assumptions made regarding firm size and aggregation by sector. Such a survey would be costly and time-consuming because small employers would need to be targeted.

Undocumented foreigners - comparison of sources

Method and data

The method is based on comparisons of different registration data. Since 1994, foreign persons in The Netherlands without a residence permit cannot register with the population administration. Therefore, comparisons of registers of the Foreigners Police and with the municipal population register can only produce estimates of the illegally resident population before 1994.

Results

In 1992 such a comparison was made for the municipality of The Hague, resulting in a number of 6,500 foreigners who were listed on the population register but did not appear on the Foreigners Police register (Gemeentepolities-Gravenhage, 1992, in Böcker and Groenendijk, 1996). A similar estimate was made in 1991 in Amsterdam, resulting in a figure of 3,700 undocumented foreigners (Bureau Nieucomers, 1992, in Böcker and Groenendijk, 1996). General problems with this method are those of human error in recording the data or delays in registration and of the reluctance of some/many illegal entrants to place themselves on the population register.

Applicability to the UK

This method is not applicable to the UK as there is no population register.

Illegal foreign population – record- and survey-based method

Method and data

Burgers (1995,1996) used a record- and survey-based method using police statistics and interviews to estimate the stock of illegal foreigners in Rotterdam and infer a total stock for The Netherlands. Illegal foreigners were defined as those persons without a residence permit and not involved in the asylum procedure.

The estimation was based on figures of apprehended foreigners between 1989-94 combined with in-depth interviews with 145 illegal foreigners. A random sample of police records was selected to derive the number of criminal illegal foreigners and these were then classified into three groups: Turks, Moroccans and Others. Through the interview process, the author determined the proportion of those involved in clandestine activities; this proportion was then applied to the police statistics for an urban, then a national estimate.

The estimation procedure consisted of several stages. First, a random sample (1:12) of police records was used to derive the number of criminal illegal foreigners, divided into three categories: Turks, Moroccans and Others. The number of apprehensions was conservatively assumed to encompass all illegal foreigners in Rotterdam. Of all categories, the figures found for Moroccans were likely to correspond best to their total population in Rotterdam and were used as the basis for the second stage of the estimation. The number of apprehensions of criminal illegal Moroccans was estimated at 1,212 for the whole period. Half the Moroccans in the sample resided for three years or less in The Netherlands and, therefore, the researchers made the rough estimation that within a period of six years the illegal population would be totally replaced by new persons. This meant that the apprehension number for the whole period had to be divided by two, resulting in 606 criminal illegal Moroccans. Subsequently, the outcome of the Rotterdam estimation was used to estimate roughly the illegal population in The Netherlands as a whole.

Results

The study produced an estimate of 11,012 illegal foreigners in Rotterdam, which is equal to approximately 1.8 per cent of the city's total population. This estimate was then used to estimate roughly the size of the illegal population in The Netherlands as a whole. The illegal population of the other three main cities (Amsterdam, The Hague and Utrecht) was assumed to be of the same size as Rotterdam. This resulted in the calculation of 44,000 illegal foreigners in the four largest cities.

To estimate the number of illegal foreigners in the rest of the country the author used the general residence pattern of ethnic minorities (45 per cent live within one of the four largest cities and 55 per cent live outside). Applying this assumption gives a total of 53,000 illegal foreigners in the rest of the country, this number was then divided by three as previous research (though the authors do not specify which) found that illegal immigrants were over-represented in urban areas, therefore the rural estimate had to be downsized. The total illegal foreign population was estimated to be 44,000 (four largest cities) plus 17,000 (rest of the country) giving a final total of approximately 60,000 persons equal to 0.4 per cent of the total population.

Delaunay and Tapinos argue that the estimate is 'original but at the same time questionable' as two of the three groups do not admit to criminal activity and the number of Moroccans is very low. However, they do acknowledge that the hypotheses for extension of the urban estimate are strong, mainly because research demonstrates that illegal immigrants are relatively over-represented in urban environments.

Applicability to the UK

It may be possible to use police statistics for the UK in this way. The authors of this report are not aware of what statistics might be available, nor how changes in enforcement patterns might have affected them.

Illegal population in four main cities - capture-recapture

Method and data

At the time of the Delaunay and Tapinos paper, researchers from the University of Utrecht were in the process of making another estimate of the size of the illegal population, focusing on the four largest cities of The Netherlands: Amsterdam, Rotterdam, The Hague and Utrecht. For each city a sample was taken from police registrations, consisting of all apprehended illegal foreigners in 1995. Recognising the strong specificity of the populations recorded in police statistics, the researchers used the capture-recapture method over a period of a year. This method estimates the relations between the risks of not being caught, of being caught once or twice, using the Poisson statistical distribution.

The researchers highlight the fact that the results are biased towards migrants who run a high risk of getting caught by the police. Clearly, those illegal immigrants who have good quality

forged documents, or who are not involved in criminality, or are living with family, are less likely to be apprehended and therefore are not covered by this method. The method is also based on a number of assumptions that are not representative of the actual situation of illegal migrants. These assumptions are that during the period of study:

- the illegal population is homogeneous;
- there is a constant non-variable chance of getting caught; and
- it is a stable population.

The first assumption could be met through the use of an appropriate regression method, which accounts for variation in reason for apprehension, age, sex and country of origin. The second assumption is more problematic: the researchers had to suppose that any changes to policy would be very modest over the one-year period. The assumption of a stable population is again problematic as it is likely that there would be peaks in flows of illegal workers, for example seasonal workers. In order to address this issue the researchers excluded certain groups from the study. Another major weakness of the method is that the analysis is limited to one year only. More experience of using the method in different circumstances would enable a conclusion to be made regarding its suitability as a method for estimating illegal migrant stocks.

Results

In The Netherlands this has proved to be an interesting approach. However, the final results of this study were not available at the time of publication. This study and the follow up are discussed in detail in Chapter 4.

Applicability to the UK

There is no reason why the method could not be used in the UK, provided that the necessary police statistics are available. At present the authors of this report are not aware of what statistics might be available, nor what happens to those who are apprehended by the police. Following discussions with the police on data availability, it would be appropriate to carry out a pilot study.

Greece

Illegal employment survey

Method and data

A study by Lianos *et al.* in 1996 analysed the impact of clandestine migrants on local labour markets.

To produce an estimate, the authors selected four regions in northern Greece where there were large immigrant populations. In each study region, three towns were selected and key 'privileged witnesses' were chosen for their good knowledge of the characteristics and extent of illegal migration in the area. These contacts acted as gatekeepers and enabled the researchers to examine over 300 companies recruiting foreign workers in agriculture, construction and, to a lesser extent, industry. The results of the survey revealed the presence of 40,189 foreign workers in the three study regions, approximately half of whom (20,228) were working illegally. The survey was not a representative sample as the northern regions have a larger established foreign population.

Results

In order to calculate a total national stock of illegally resident persons, the authors used the results obtained from the agricultural sector, which were considered to be more reliable. It was assumed that all the permanent workers in this sector were legal in order to estimate the size of the foreign workforce in man-years. Applying this relative proportion from the agricultural sector to the total Greek workforce, it was estimated that 157,000 foreigners worked illegally on a permanent basis. It was then assumed that the foreign workforce is largely temporary, most working one-third of the year in agriculture; therefore the total

permanent illegal workforce was multiplied by three to give the highly questionable total of 470,000 persons living and working illegally in Greece.

Applicability to the UK

The method is based on the agriculture sector and it would not be appropriate in the UK to relate the proportion to the total workforce as was done in Greece. The method could be used to give some insights into the agriculture sector, provided that 'privileged witnesses' agreed to participate. These would be from both farming companies and the gangmasters supplying the labour. A difficulty would be the degree of representativeness obtained from the mix of large and small enterprises, different seasonal requirements and so on.

France

Comparison of census and the Permanent Demographic Survey

The Permanent Demographic Survey (EDP) is a one per cent sample from the census that has monitored the resident population in mainland France since 1967. Information from the 1968 census has been updated every year and includes persons born on four days of the year. It is a source of continuous demographic data that includes information on life events which concern all immigrants regardless of status, and is therefore likely to include information on foreigners in an illegal situation of residence or employment as it becomes increasingly difficult to avoid registration during a period of continuous stay.

Method and data

By comparing differences in the EDP and the census it may be possible to estimate to what extent any irregularities could be attributed to illegal immigration. In order to do this, an inter-census calendar of the arrival of immigrants traced in the EDP had to be constructed, based on the oldest individual census form and the question associated with prior residence. Rouault and Thave explored the possibilities of this method.

Results

Rouault and Thave found that data deficiencies rendered the use of this method unsuitable for estimating the stock of illegally resident persons in France. The major limitation of this method is the incompleteness of the data sets, particularly for the EDP where the collection failure is particularly high for foreign nationals. Non-declaration of date of birth and reliability of the responses to the question of prior residence by immigrants were the principal explanations given by the authors for these deficiencies. In addition, they suggest that not all the differences could be attributed to clandestine immigration, as the accuracy is limited due to the difference in coverage and nature of the two sources.

Applicability to the UK

Some attempt might be made to compare the census and the Labour Force Survey or the Longitudinal Survey. However, the sample size of both would probably preclude a useful result.

Belgium

Michel Poulain's report in Delaunay and Tapinos presents an estimate of the number of illegally resident foreigners in Belgium that was used at the time of publication in Parliamentary debates in that country.

Method and data

Neighbouring countries had estimated their illegal foreign population to be ten per cent of their legal foreign population, although it is not stated what the basis was of this estimate. The Belgians used this assumption as the starting point for their calculation.

Results

The illegal foreign resident population in Belgium was estimated to be 90,000, representing ten per cent of the legal foreign population (900,000). Poulain stresses that this estimate is based on a widely unfounded assumption and has rarely been adjusted to include new migration phenomena such as increasing numbers of Polish migrants since 1990. He therefore says that there is no official estimate of the real extent of the illegally resident stock of foreigners in Belgium.

Applicability to the UK

A comparison of the situation in the UK is problematic as there are two major sources of error: the accuracy of the figures relating to neighbouring countries and the degree to which the UK might be comparable with them. These points and others are taken up with respect to estimates based on regularisation programmes in Chapter 5 of this report.

Czech Republic

Illegal employment of foreigners in the Czech labour market – Delphi method

The Research Institute of Labour and Social Affairs in Prague carried out this study into the illegal employment of foreigners in the Czech Republic in 1997.

Method and data

The project aimed, firstly, to produce a description of the legal provisions for foreigners concerning work and residence and to identify possible loopholes in the legislation that could be exploited and enable foreigners to work and live illegally in the Czech Republic. Secondly, using the Delphi technique, the study aimed to quantify the illegal employment of foreigners, identifying countries of origin, occupations and sectors through discussions with experts such as migration officials and researchers.

Results

The results of this study were not available at the time of the Delaunay and Tapinos publication.

Applicability to the UK

A Delphi approach could be used in the UK situation, but it is not clear how the estimate could be verified.

Switzerland

At the time of the Delaunay and Tapinos study, no official body had conducted a study focusing on the stock of illegally resident foreigners in Switzerland. Unofficial estimates ranged from 50,000 to 150,000 illegal residents.

Comparison of sources

Method and data

The Swiss contributors (Heiniger and Haug, 1998, in Delaunay and Tapinos, 1998) suggested that it would be possible to use a comparison of sources to estimate the stock of illegally resident persons. The 1990 census and administrative register data for the corresponding years could be compared to highlight any discrepancies as far as the total number of foreigners and their legal status were concerned, although the authors suggest that it would be difficult to definitely interpret any discrepancies as illegal residents or workers.

Applicability to the UK

This particular method could not be used in the UK which has no registration system. However, the general principle of comparing two sources, such as successive censuses could be used, depending on their accuracy.

Education surveys

Method and data

The contributors also suggest that annual education surveys on the number of students could be compared with administrative register data for the foreign population of school age. Any discrepancies for the number of children in certain sectors of the foreign population may indicate illegality. The data are available at a communal level.

Applicability to the UK

It is not clear what statistical data are available in the UK on the school population, though pupil mobility would be a problem. In any case, there is no UK population registration.

Conclusion

Delaunay and Tapinos stated that 'the most obvious and disappointing finding which emerges from this recapitulation of measurements of the clandestine alien population is that we have practically nothing that is well-founded' (1998, p.54). At the time of the study, important immigration countries such as France, Germany and the UK had made no attempt to size their illegal population. Estimates that had been made rarely exclusively covered the illegal population. The Italian studies, for example, are focused primarily on estimating the total foreign population. Others deal with particular sectors (e.g. Greece) or groups (e.g. The Netherlands).

4. Phase 2: Recent studies

Introduction

A number of countries around the world have attempted to calculate their illegally resident population. This section gives details of some of these case studies, outlining the aims, methods, data used and applicability of the method to the UK. Some of the methods mentioned are those discussed by Delaunay and Tapinos (1998) but have been further developed over the past four years. Much of the work done over the past decade or so has been in the United States and it is there where some of the largest and most in-depth analyses have been undertaken. One of the most comprehensive of these studies was by the United States Census Bureau. It was published in 2001 using data from the US decadal census in 2000.

Country case studies

This chapter lists country case studies not included in the Delaunay and Tapinos study, either because they are more recent or they deal with states outside Europe. The country with the most accurate estimate of its illegal migrant stock – Australia – is not included here. Its comprehensive entry and exit recording system and its remote island location mean that the number of overstayers is continually known. However, the data source is unique.

The first country to be considered is the US, where a number of careful studies have been made.

United States

Unauthorised migration to the United States has been well researched over the past three decades. Many of the early estimates that attempted to quantify the situation produced estimates in wide bands and had broad policy implications. Much of the more recent research has prompted debate on the impact of illegal immigrants on labour markets, welfare resources, health services and public expenditure (Van Hook and Bean, 1998; Clark and Zimmerman, 1997). The case studies discussed here are the most recent pieces of US research and, at the time of writing, are regarded as the most successful.

US Census Bureau (2001)

The United States Census Bureau has used Demographic Analysis (DA) to assess the coverage of the US census since 1960. The DA serves to calculate the net undercount of the census by comparing aggregate data sets. These include the comparison of administrative statistics on mortality, authorised migration, unauthorised migration, emigration, and medical records with the census results. Any difference between the DA benchmark population and the census count provides an estimate for the undercount rate. No consideration is given to the possible undercount in these other sources. Another approach to the undercount assessment is made by the Accuracy and Coverage Evaluation (ACE) which is a survey-based assessment. The ACE gives a good assessment of the undercount generally and within specific groups, such as those identified by age or ethnicity. It is not clear from the Census Bureau study how useful it was in picking up illegal residents.

These two post-census assessments differed greatly in result and there was concern over the magnitude of the discrepancies. The highest reasonable estimate for the undercount by the DA was 0.32 per cent while the ACE estimate was 1.15 per cent. As a result the Demographic Analysis Population Estimates (DAPE) research project questioned the discrepancies between the two undercounts concentrating on international migration and the assumptions applied to the components of change.

The DAPE research project sought to calculate the foreign-born population of the United States using Immigration and Naturalization Service (INS) data on legal migration flows, both permanent and temporary, and compared it to the census-provided figure. The DAPE team came up with a range of estimates based on a spread of variations in each population component. As part of this research the team had to assess the assumptions made about the size of the illegal component of the foreign-born resident population in the United States.

Methodology

The US Census Bureau used a residual method to calculate the foreign-born population. The method compared the census *enumerated* foreign-born with the *expected* foreign-born using administrative INS data to assess the completeness of coverage of the census. In doing so, they were able to calculate the unauthorised component of the foreign-born population. The calculation used figures for legal immigrants, temporary migrants, and an implied number of unauthorised migrants (Deardorff, 2001).

$$\text{Foreign-born population} = [L - (M+E)] + T + R$$

- L = Legal immigrants
- M = Mortality to legal immigrants
- E = Emigration of legal immigrants
- T = Temporary (legal) migrants
- R = Residual foreign-born (unauthorised migrants)

Components

Different teams worked on each international migration component of the formula. Costanzo *et al.*, (2001) worked on unauthorised migration, Mulder *et al.*, (2001) focused on legal foreign-born emigration, Cassidy and Pearson (2001) worked on legal temporary migration, and Perry *et al.* (2001) examined legal immigration.

Legal immigrants (L) are those non-citizens of the United States who have been granted legal permanent residence. This component includes those who are new arrivals to the US, those who have switched to permanent residence, pre-1982 entrants, asylum seekers and refugees. The calculation also includes those switchers who were Special Agricultural Workers (SAWs). It utilises the INS data for the entrance of these persons and applies estimated mortality and emigration rates to each cohort.

Foreign-born legal emigrants (E) who have departed from the United States to reside abroad are included. The calculation estimated the number of emigrants using a residual methodology based on data on the foreign-born population by period of entry from two consecutive censuses. The resulting number of emigrants was used to calculate the rate of emigration. This was the emigration rate for the entire foreign-born population, but was used as a proxy for the legal immigrant population. The emigration rates were applied to the legal immigrant population from 1990 to 2000, to give an estimated emigration figure *per annum* from the legal population.

Survival rates (M) were calculated from life tables of the total population by sex and age and were used as a proxy for the legal immigrant population. They provided figures for the number of deaths of the legal immigrant population from 1990 to 2000.

The temporary component (T) included those who had been allowed to enter for a specific purpose for a temporary period and not for permanent residence. The component encompassed foreign students and temporary workers but not tourists or business workers.

The final element of the formula, the residual foreign-born (R), was divided into two separate components – quasi-legal and illegal. The quasi-legal component includes those who are in the asylum backlog, deported migrants, and persons legalising over the census decade, although no specific definition of those who were illegal was given.

$$R = R_1 + R_2$$

R_1 = The *known* components of the residual foreign-born (mostly quasi-legal migrants)

- Calculated from INS data, at 1,700,000 in 2000.

R_2 = *implied* unauthorised migrants

- After reviewing earlier estimates by a series of migration experts and the A.C.E., the DAPE team applied an estimated undercount rate of 15 per cent to those categorised as residual foreign-born in the census, to reach a 'true' figure. This percentage of 15 per cent was retrospectively deemed too high by migration experts. A 15 per cent undercount rate represented the midpoint of previously used rates but did not account for improved coverage for the 1990 and 2000 censuses.

Table 4.1 gives details of the results of the 'true' level foreign-born population and its constituent migrant components – legal migrant, temporary migrant and residual foreign-born – as calculated by DAPE. This is a baseline estimate as it assumes complete census coverage for temporary migrants; alternative estimates, as discussed below, assumed a 'true' level estimate of 1,200,000.

Table 4.1

Migrant status	
Foreign-born	32,635,199
Survived legal immigrants	21,612,023
Temporary migrants	781,507
Residual foreign-born	10,241,669

Alternative assumptions

Clearly there are endless possibilities to the number of alternative undercount scenarios. However, the US decided on making an upper- (Table 4.4) and lower-bound scenario (Table 4.3), based on the most reasonable assumption, which is referred to as the "DAPE Estimate" (Table 4.2). For this DAPE estimate, alternative assumptions, based on discussions with experts, were made on the results shown above.

- 2 per cent undercount for legal immigrants
- 35 per cent undercount for temporary migrants
- 5 per cent undercount for known components of the residual foreign-born
- 12.5 per cent undercount for implied unauthorised migrants.

Which resulted in:

Table 4.2

Migrant status	
Foreign-born	33,091,988
Survived legal immigrants	21,612,023
Temporary migrants	1,200,000
Residual foreign-born:	10,241,669
- known component	1,789,474
- unauthorised (implied)	8,490,491

For the lower-bound DAPE estimate

- 1 per cent undercount for legal immigrants
- 7 per cent undercount for temporary migrants
- 1 per cent undercount for known components of the residual foreign-born
- 10 per cent undercount for implied unauthorised migrants.

Table 4.3

Migrant status	
Foreign-born	32,174,511
Survived legal immigrants	21,612,023
Temporary migrants	1,200,000
Residual foreign-born:	9,362,488
- known components	1,700,000
- unauthorised (implied)	7,662,488

For the upper-bound DAPE estimate:

- 2 per cent undercount for legal immigrants
- 35 per cent undercount for temporary migrants
- 5 per cent undercount for known components of the residual foreign-born
- 15 per cent undercount for implied unauthorised migrants.

Table 4.4

Migrant status	
Foreign-born	33,347,473
Survived legal immigrants	21,612,023
Temporary migrants	1,200,000
Residual foreign-born:	10,535,450
- known components	1,700,000
- unauthorised (implied)	8,835,450

It is likely that the coverage of the census improved from 1990 to 2000 because of advertising and specific programmes designed to do so, and undercount scenarios have changed to accommodate this. The DAPE project had limited time to establish firmer assumptions about the undercount rates. In addition, rates that are specific to legal status or race are harder to establish. However, programmes such as the Binational Study (1997) that examined migration between Mexico and the United States have shed more light on the situation (US Census Bureau, 2001).

The largest revision made in the study was to the residual foreign-born figures that were raised by 1.38 million to 10.24 million: the majority of these were thought to be unauthorised residents on the grounds that they were not part of the known component.

Data used

Both the legal immigrant and temporary migrant components were based on data from the INS, broken down by age, sex and race. The known component of the residual foreign-born was also calculated using the INS data which were largely composed of asylum applicants in a processing backlog, those who had been deported or had adjusted status.

Applicability to the UK

A residual method is based on the subtraction of the *expected* from the *counted* foreign-born population at the census date. The key to the accuracy of this derivation relies heavily upon the quality of the data collected and the assumptions that are made about the various demographic and immigration components under consideration. This method could, in theory at least, be used for the UK; the key would be making the right assumptions about the various components. This means getting agreement from experts on the appropriate figures for each component of the legal flow to allow calculation of a residual figure which is the illegal stock. Natural change rates for cohorts might be calculated using Labour Force Survey (LFS) statistics. Professor David Coleman of the University of Oxford is working on the calculation of these.

Costanzo *et al.*, (2001), the DAPE team assigned to calculating the residual foreign-born in the US, noted that the increasing significance of quasi-legal migrants had a detrimental impact on the accuracy of the total residual foreign-born. The applicability of this method in the UK would be subject to the same difficulties. For example, asylum seekers awaiting a decision on their case, those awaiting deportation and those legalised over the census decade present significant challenges to a residual calculation. Nevertheless, such methodological limitations would apply almost everywhere and as such do not mar the case for a residual calculation of this nature in the UK.

United States – Bean *et al.* (2001)

Bean *et al.* (2001) estimated the number of unauthorised Mexican migrants residing in the United States in 1996. The results of this estimate were then extrapolated to give an estimate for 2000. The research compared the 1996 estimate by Bean *et al.* (2001) to one made by the Immigration and Naturalization Service (INS). This comparison highlighted the differences in assumptions made about “circular, invisible and ambiguous migrants” (Bean *et al.*, 2001, p.411). The research suggests that such differences have far-reaching consequences for subsequent policy strategies.

Method

The analysis used figures from the 1990s from the Current Population Survey (CPS), a monthly household survey conducted by the US Census Bureau. These data contain details of the foreign-born population and the enumerated Mexican-born population residing in the United States.

The method begins with the assumption that the Mexican population in the US (T) consists of legal (L) and illegal components (U) thus, $T = L + U$. Both L (legal) and U (illegal) have enumerated (L_e and U_e) and non-enumerated parts (L_{ne} and U_{ne}) i.e. those that were missed by the census and those that were not.

$$\begin{aligned} L &= L_e + L_{ne} \\ U &= U_e + U_{ne} \end{aligned}$$

The method assumes that both the legal and illegal components of the Mexican-born populations have non-enumeration rates or undercount rates. These are included in the equation as N_l which represents the undercount rate of the legal component and N_u the illegal non-enumeration rate. Thus,

$$\begin{aligned} L_e &= L (1.0 - N_l) \\ U_e &= U (1.0 - N_u) \end{aligned}$$

The *enumerated* Mexican-born population can be written in the following form by rearranging the above equations.

$$T_e = L (1.0 - N_l) + U (1.0 - N_u)$$

In order to determine the illegal or unauthorised Mexican-born population resident in the United States the equation is then solved for U ,

$$U = \frac{T_e - L (1.0 - N_l)}{1.0 - N_u}$$

With a knowledge of the enumerated Mexican-born population (T_e), the authorised Mexican-born population (L), and undercount rates for authorised (N_l) and unauthorised (N_u) migrant components the method estimates the unauthorised Mexican population in the US (U).

Data

The total enumerated Mexican-born population (T_e) was calculated using data from the 1996 CPS. The figures were adjusted for an assumed undercount by five per cent which was deemed reasonable for Hispanic groups. This figure was derived from the estimated undercount of the Post Enumeration Survey after the 1990 census which was broken down by broad racial and ethnic categories.

The legally resident Mexican-born population (L) was estimated by carrying forward old estimates by Woodrow (1991), partly based on an earlier estimate by Woodrow *et al.* (1987) that used alien-registration data (now defunct). The figures were adjusted for emigration, SAWs and for those in a quasi or 'ambiguous' status. The latter category might include those who are dependants of those legalised under the Immigration Reform and Control Act and are present illegally or are pending a decision on their case. A series of scenarios was calculated that took into account these ambiguities, the median being 4.502 million.

Undercount scenarios for the legal and unauthorised Mexican-born populations (N_l and N_u) were estimated from previous studies on Hispanic populations by the US Census Bureau. The legal undercount was assumed to be between three and five per cent while the unauthorised undercount, estimated from research such as the Binational Study (1997), a joint study funded by the governments of both countries and carried out by academic specialists from each country, fell between 15 and 25 per cent.

Results

The results estimated the unauthorised Mexican-born population to be between 1.5 and 3.7 million in March 1996 with a median estimate of 2.543 million. Extrapolation of the 1996 results (2.54 million) to March 2000 yields a result of approximately 3.90 million unauthorised Mexican migrants residing in the United States. The report went one step further and suggested that if unauthorised Mexican migrants represented 55 per cent (a guesstimate based on estimates for the mid-1990s) of all unauthorised migrants then the total unauthorised stock for the United States would be approximately 7.06 million.

Assumptions

The various assumptions in the method included different scenarios for the emigration of legal Mexican immigrants from the US and differing undercount scenarios for the enumerated components of the formula. The method uses alternative estimates based on three main points. Similarities between the Bean *et al.* (2001) 1996 estimate and the 1996 INS estimate (2.7 million) were found to mask components that work in opposing directions and yet yielded similar results. For example:

1. Circularity – where assumptions are made about where legal immigrants live. For example there may be confusion over those migrants who took advantage of the IRCA legalisations and became Special Agricultural Workers (SAWs). An unknown number of SAWs have moved back and forth between Mexico and the United States since the programme's inception.
2. Invisibility – differential undercount scenarios. The range was taken to be from three to five per cent for legal Mexican migrants and from 15 to 25 per cent for the illegal Mexican component.
3. Ambiguity – who is considered unauthorised? For example what is the status of IRCA family members – authorised or unauthorised?

Changing the size of these three variables has a great effect on the final outcome of the estimate. The magnitude of the estimate does shift greatly as the components do not operate in the same direction. For example, by taking into account assumptions one and two the result of the estimate will be lower than that of a comparative estimate that uses similar data. In contrast, by assuming that IRCA family members are unauthorised migrants, the tendency would be to generate a higher estimate of the size of the total illegal Mexican population. The authors discuss how the assumptions may be modified one at a time, changing the

parameters of each component to reflect the INS assumptions about the number of resident SAWs, those of ambiguous immigrant status, undercount of legal residents and undercount of unauthorised migrants. In this way a set of new estimates can be produced, each of which is compared with the baseline model estimate.

Applicability in the UK

The method is based on comparing two sets of estimates. However, there is no UK equivalent of the Current Population Survey (CPS) nor does the UK have a baseline for calculation such as the 1986 IRCA. There is also no aliens registration source. The main value of the study as far as the UK is concerned is in demonstrating how different sets of assumptions may be used to create a series of linked estimation models.

United States – INS estimate (Warren, unpublished)

This report used a new methodology to establish an estimate of the unauthorised immigrant population in the United States for the 1987 to 1997 period. The method uses administrative data from the INS to piece together annual estimates for each year from 1987 onward. The report, subpoenaed by Lamar Smith at the US Department of Justice, was never published and will be superseded by research in the future that will make use of more recent data. Nevertheless, the research in the draft report, available on the web, does give the details of an applicable method.

Method

The estimate is based on demographic INS administrative data from 1987 to 1997 and Current Population Survey (CPS) data from 1996, 1997 and 1998. Estimates were made by subtracting estimates of the legal foreign-born population from the estimated total foreign-born population. Estimates were then derived for the unauthorised population in the US for each annual cohort. Each of these annual cohort estimations was then adjusted for deportation, emigration, mortality and fertility rates allowing an estimation of the cohort size in its year of entry. By using an earlier INS estimate for the unauthorised population in 1987 it was then possible to calculate the total unauthorised population for each year from 1987 to 1997. This was done in various stages:

1. Estimate the *total* foreign-born population that entered every year from 1987 to 1996 and was in the US until January 1997.
2. Estimate the *legally* resident foreign-born population that entered every year from 1987 to 1996 and was in the US until January 1997.
3. Estimate the *unauthorised* resident population that entered every year from 1987 to 1996 and was in the US until January 1997. A residual calculation of steps one and two gives a figure for the unauthorised immigrant population.
4. Reconstruct the demographic history and estimate each initial cohort size from 1987 to 1996.

Each of these stages took into account five components of change for each cohort, namely,

- deportations/forced departures;
 - adjustments to legal resident status;
 - brief departures and returning as legal immigrants;
 - emigrants; and
 - deaths.
5. Calculate annual estimates taking into account components of change to produce a final unauthorised immigrant population in January 1997.

Data

The total foreign-born population was calculated using CPS data, which were adjusted for undercount. The scale of the adjustment is shown but the underlying principles are not described in detail. Calculations for the *legally* resident foreign-born populations were based

on INS data. The data gave details of those persons newly arrived in the US with lawful permanent residence (LPR). These data were altered to reflect the year of entry rather than the year of adjustment for those with new LPR. Also the calculation took into account unauthorised immigrants who departed briefly and returned with visas, and also SAWs who immigrated to the US after application under IRCA between 1988 and 1991 (mostly Mexicans). The paper does not say whether this involved a data-matching exercise.

Results

The results were presented in five series of estimates – each one taking into account the variables as shown in the list below. The ‘middle’ series is deemed the most reasonable estimate, which took into account:

- adjustments for under-enumeration;
- long-term non-immigrants;
- legal resident status adjustment;
- INS removals that subsequently return;
- IRCA misreporting rates; and
- CPS data variation and undercount.

The calculations made were based on each annual entry cohort from 1987 to 1996. Table 4.5 below shows the framework of this process just from 1990 onward. The underlined figures, shown below, are the cohort size in the year of entry; the italicised numbers are the losses from that cohort for each year (from the five components of change as described above); and the boxed figure is the remainder of the unauthorised population still resident in 1997 (thousands).

Table 4.5

							Jan 1997		
							1996		
							1995	1996	
				1994	<u>482</u>	<u>464</u>	21	443	
				<u>485</u>	16	18	26	437	
		1993	<u>504</u>	18	25	24	37	408	
	1992	<u>537</u>	20	26	37	35	35	390	
	1991	<u>643</u>	21	31	37	32	32	391	
1990	<u>799</u>	25	36	47	42	37	37	442	
				42	37	39	43	528	

etc.

This calculation continued backward to 1987 and included a pre-1987 lump sum figure. The total annual cohort when compiled for each year from 1987 – 1997 gave 5.1 million as the January 1997 total (using the middle series estimates). The lower- and upper-bound estimates were 4.6 million and 5.7 million respectively. The results show large influxes of unauthorised migration in 1988 and 1989, a decline from 1990 to 1992 and a degree of stability until 1996. The ability of the model to determine trends in illegal stock is a relative advantage over other models.

Applicability to the UK

The only data source available in the UK that gives year of entry data is the LFS. It might be possible to use successive quarters to develop a sample to test how far the year of entry data could be used. This might be done by using successive samples to estimate the ‘survival rates’ of those entering in particular years.

In general, residual methods all use a similar approach. The main components of such an exercise are well known. The data required are those of stocks at two points in time, disaggregated statistics on births and deaths by nationality or country of birth and estimates of the size of the various components of legal migration. If the two stock figures are accurate, as might be expected from censuses, the demographic events and migration flows properly recorded, with expert opinion filling in the gaps (relating to such events as visitor switching)

added, then a reasonable attempt at calculating the size of the unrecorded population might be made. However, in the UK the availability of data on demographic events linked to migration status is not certain and there is no guarantee of the feasibility of this method for application in the UK.

Switzerland – Piguet and Losa (2002)

Etienne Piguet and Stefano Losa have recently published a book entitled *Travailleurs de l'ombre* (2002) which examined asylum seekers, illegal immigration and the labour market in Switzerland. The book makes a partial overview of the different methods that could be used to measure the size of those illegally resident persons who are employed in Switzerland. This review relies heavily on Delaunay and Tapinos (1998).

The study was primarily focused on asylum seekers and their employment in Switzerland. An empirical study was undertaken based on a survey of Swiss employers in order to ascertain the size of the illegally resident workforce employed in their 'sector' but also contained questions pertaining to asylum seekers. The method synthesised the subjective opinion of many key informants into a systematic estimation using the Delphi method.

Method

An anonymous postal survey was sent to 5,500 employers randomly selected among employers of asylum seekers in Switzerland. The questionnaire contained specific questions designed to ascertain the employment of asylum seekers but also more general questions regarding the percentage of illegal foreign workers in the sector, not the specific company. The question relating to illegal workers asked:

- In their estimation, for their sector, what is the proportion of non-declared foreign labour (i.e. those without authorisation or a permit to stay) as a percentage of those employed (both Swiss and foreign-born persons)?

Key assumptions

The research had to make assumptions about employers' knowledge of their field of activity, taking into account the following points:

- employers are informed about the manpower demand in their field of activity;
- employers are ready to give – anonymously – an honest estimation of the proportion of illegal immigrants in the total manpower in their field of activity (not in their company); and
- employers know the legal status of their foreign workforce.

Results

The method is very general in its approach and so the results yielded are only a broad indication of the actual picture. The survey had a 25 per cent feedback from the employers that were contacted, but only 15 per cent for the question concerned with the illegal foreign workers. The results gave an illegal estimate by sector, for example agriculture with eight per cent. Additionally, the feedback provided an indication of the total number of illegal workers based on the knowledge that the total number of workers was a known quantity.

Within economic sectors, large disparities were apparent in the employers' estimations. Earlier estimates in Switzerland by Arbenz (1995) (50,000 to 100,000) and FOBB (1990) (120,000 to 180,000) also experienced large ranges in their estimates. In order to minimise this, Piguet and Losa used the mean estimate to synthesise the employer's opinion, not the median. The mean method yielded approximately 180,000 illegal immigrant workers whereas the median method yielded 70,000. One could hypothesise that the average compensates for areas of higher 'non-declared' activity (domestic services, cleaning) and areas of lower 'non-declared' activity (banks, insurance, etc.).

The statistical strength of the results is not good and the deviation in the results showed this. However, it was highlighted that the main aim of the project was to examine asylum seeking and the illegal estimation was really a preliminary addition. More than anything, the report demonstrated the lack of consensus amongst employers on the scale of employment of illegally resident persons. No evidence was presented to indicate that the level of consensus varied by sector.

Applicability in the UK

This method could be used with a carefully designed survey aimed at UK industries. Alternatively, questions pertaining to illegal employment could be incorporated covertly into anonymous questionnaires overtly aimed at surveying employment in general. This might provide answers that are more honest and do so without compromising respondent confidentiality. Ultimately, however, the principal weakness identified above would remain: that lack of consensus among employers would give too broad a result.

Belgium – Ministry of Employment, Ministry of Social Affairs (2002)

Introduction

The Ministry of Employment and the Ministry of Social Affairs supported a joint project that sought to combat illegal employment. The Ministries undertook extensive research into the composition of the Belgian workforce, aiming to establish the degree of illegality of workers in terms of both residence and work status.

Method

After eight months of checks into employment in various sectors, the survey established the working status of 1,436 workers. Of these, 416 were found to be without a residence permit and/or a work permit. The survey aimed to ascertain the illegal element in certain sectors that were thought to be foremost in the attraction of illegal work, including cleaning companies, restaurants, clothes workshops, and agricultural/horticultural workplaces. The results were weighted to take into account those sectors that are controlled. The selection of companies was based on information from the labour ministry inspection service. A number of self-employed workers were also verified for status (426), many of whom were found to be present despite contravening labour restrictions, on the basis of a non-compliance with self-employment rules in the EU.

Results

The illegal workers discovered by the survey showed that the largest element was from Asia (42.7 per cent) with those from Europe and Africa making up 30 per cent and 24.2 per cent respectively. The construction sector was shown to have the greatest number of illegal workers making up 44.2 per cent of the total, many of whom were from Poland and Rwanda (52 per cent). The hotel and catering sector made up 11.1 per cent of the total and had a majority of Chinese nationals (81 per cent). Other significant sectors included agriculture (9.9 per cent), prostitution (9.6 per cent), textiles (9.1 per cent), and cleaning (6.4 per cent).

Applicability in the UK

The information was built up from enforcement activity. A similar exercise could be done in the UK, perhaps based on data resulting from workplace raids in search of illegal working. A more detailed knowledge of the information collected by the authorities is required before any commitment can be made to use of this method.

Costa Rica – Brenes (2000)

Introduction

Immigration from Nicaragua to Costa Rica is a political issue in Costa Rica. This report examines the indirect estimation methods that could be used for the creation of policy on this migration. In the late 1970s and 1980s the number of people coming from Nicaragua

increased due to the civil war there; although the conflict has ceased, there continues to be a large flow for economic reasons.

Since 1984 there has been no census in Costa Rica; thus there is no official estimate of the stock of foreigners living in the country. Statistics for border entry and departures are assumed to suffer from large amounts of undercount. Some assume that the number of illegal immigrants is high, as the border is relatively easy to cross and patrols are not enough to marshal the process (Brenes, 1999). Earlier estimates in 1998 by Castro and Morales produced results with a range of 500,000 to 750,000 Nicaraguans. However, these and other estimates are quite dissimilar to the numbers applying for the regularisations that took place during the 1990s, and contain little explanation to the method used for calculation. The 1999 regularisation recorded just over 150,000 Central Americans who were mostly Nicaraguans (Brenes, 2000).

The report reviews other methods aimed at measuring the Nicaraguan population in Costa Rica. The detailed methodology refers to work done by Brenes (1999), Garcia (1979) and Castro and Morales (1998) and, while not directed at measuring an illegal population, it does provide a good example of how to measure an unknown population from administrative data using demographic formulae.

Method

Brenes (2000) discusses a method based on differential fertility levels to estimate the number of Nicaraguans (living both legally and illegally) in Costa Rica. The count is based on the number of Nicaraguans recorded in the 1984 census plus subsequent births to Nicaraguan women, to give a later total. The initial stage of this estimation is based on a calculation of the number of Nicaraguan women of fertile age (NWF_z) resident in Costa Rica using the following formula.

$$NWF_z = \frac{\text{Births in year Z (Nicaraguan women)}}{\text{Costa Rican general fertility rate in year Z} * \text{index}}$$

The index refers to the fertility level of Nicaraguan mothers in Costa Rica in comparison to the fertility level of Costa Rican women. Calculations revealed that the NWF_z was approximately one-sixth of the total Nicaraguan population in Costa Rica as enumerated in the 1984 census. So, by considering the total Nicaraguan population in year Z (TNP_z) it is possible to write:

$$TNP_z = (\text{Total Nicaraguans (1984)/ NWFz (1984)}) * NWF_z$$

Assumptions

The method assumes that the record of births for Nicaraguan and Costa Rican women is the same. It also assumes that the birth records used to calculate the *index* in the initial equation is a fair representation of the ratio of Nicaraguan to Costa Rican fertility levels. The estimation relied on the continuity in the proportion of Nicaraguan women of fertile age in relation to the total Nicaraguan population in 1984 (the census year). The results indicate that there are approximately 300,000 Nicaraguans residing in Costa Rica.

Applicability in the UK

The method relies on the availability of birth statistics by nationality or country of birth and on a stock figure with a similar breakdown to give the size of the population at a later date. These data are available for the UK from the census and from birth registration. However, there still remains the problem of calculating the scale of the proportion of a given stock who are illegal.

Italy – Non-regular foreign input of labour in the new national accounts estimates (Baldassarini, 2001)

Introduction

The aim of this report was to deliver estimates on the number of illegally resident foreign workers for a number of years in the context of Italy's national accounts. Flourishing 'non-regular' and transitory employment has seen expansion in unskilled and low-salary jobs and those sectors undergoing economic crises such as agriculture. It is suggested that in Italy the measurement of such a population might be easy as a requirement is made for foreigners to produce documents relating to their residence, duration of stay and job. However, precise determination is unsurprisingly very difficult because of conflicting and overlapping data sources and the clandestine nature of some workers. In this context, 'non-regular workers' refers to those persons present in Italy without a permit to work, a group which may include those with or without a valid residence permit.

Non-observed and observed economic activities can be calculated economically by using the conceptual framework as laid out by the United Nations System of National Accounts (1993) with modifications for the European equivalent (ESA95) (Gismondi and Ronconi, 2001). This arises from the need to detail the 'exhaustiveness' of national accounts: the ability to account for those elements of production, income and expenditure that are not covered by statistical sources or administrative statistics. The measure of exhaustiveness has become increasingly significant in the European Union, as GDP estimates are elemental to calculating the amount paid back to the Union. In this context, ISTAT calculates illegal employment and unobserved activities to improve national account calculations.

Method

The method is essentially *comparative* and is based on the quantification of non-regular and regular employment into employment hours. This required the collection of employment and unemployment statistics for foreigners and a reconstruction of a time series using these various sources. The regular employment of foreign workers was estimated by integrating 1991 census data with Social Security (INPS) data. The procedure followed for the estimation was to assign a different weighting to the various sources available and then to proceed with the comparison of data at a regional level with the aim of validating all the information collected. In general, the census data were more reliable than administrative sources and were used in most cases. The approach used differed for employees and the self-employed. Employee data were obtained by comparing the census data with other specific sources at regional level. Data on the self-employed combined census statistics with data on residence permits granted for work reasons.

An estimate was also made by creating a series for non-regular foreign employment. This was based upon a reconstruction of a historical time series using different sources. This series utilises a conceptual grid that considers data availability and information capacities of various sources. The procedure for the creation of the series was as follows: collection for several years of different statistics on the employed and unemployed foreign population and reconstruction of historical series; estimation of the series of non-regular employed foreigners; and creation of a weighting factor for the sectoral redistribution of the estimate produced.

This non-regular workforce calculation considers three fundamental types essential to estimating the illegal workforce; these are those that have:

1. legal residence but are working illegally;
2. illegal residence and are working illegally due to expired or no work permit; and
3. clandestine workers – illegal residence and working in an unrecorded job.

For the first of these the Ministry of Labour, Ministry of Internal Affairs, National Statistical Institute (ISTAT), and INPS used the following techniques:

- comparative work on employment statistics and work permits;

- comparative work on employment enrolment lists and work permits; and
- analysis of employment enrolment lists that gave details of persons performing non-declared jobs.

For the second the Ministry of Internal Affairs used the following techniques:

- analysis of regularisation data of 1990, 1995 and 1998, to determine the number of persons who were legalised in these years;
- estimation of those left out by the amnesty because they were not able to meet the required conditions laid out in the first and/or subsequent regularisations; and
- estimation of flows of new 'non regulars' since then i.e. those who have switched from a legal status to illegality.

The data used included residence permits by reason of issue, numbers of student workers, numbers regularised, data on street vendors and self-employed in commerce and construction, estimates of hidden employment in agriculture and as household workers.

For the third the Ministry of Labour, Survey of the National Institute of Agricultural Economics (INEA) examined farm workers and other indirect indicators. For each of the observed sectors a 'non-regularity' rate was applied based on Ministry of Labour data:

- analysed figures for street vendors/self-employed in commerce and construction;
- estimated hidden employment in the agricultural sector; and
- estimated hidden employment of household workers.

Having estimated the various components of illegal employment, it is possible to calculate the number of hours worked. This is calculated from the national accounts. Employment can be measured in terms of people employed, the jobs carried out by employees or the number of full-time hours worked. In this method, the latter unit of calculation was used, known as the *full-time equivalent employment* (FTE). This is obtained from the addition of part-time and full-time working activities to create FTE. Lack of consensus over the amount of hours worked by illegal employees led to the assumption that all estimated employed foreigners worked in full-time employment.

Data

Data sources were collected from various governmental sources. Resident permits for labour reasons were used. These are processed by ISTAT and give details of duplication and expiration of permits for foreigners. The INPS provided data on the pay contributions of employees and INEA, the agricultural employment body, carried out a survey in that sector to estimate the annual number of foreign employees working every year. The 1991 population census provided details of the number of legal workers. Data from the Ministry of Labour provided details of unemployed foreigners as of 31 December every year. Periodic information relating to the regularisation of the illegally resident population, employment cards data (from Local Employment Offices), and labour permits (Ministry of Labour) provided additional sources of data.

Results

The results indicated a strong growth in the foreign component of non-regular employment, increasing from 395,000 units (FTE) in 1991 to 569,000 in 1999. In the 1992-1996 period, there was also an increase from 12.6 per cent to 16.3 per cent in the number of illegal foreign workers as a percentage of the total domestic non-regular FTE.

Applicability in the UK

It seems likely that this method could, in theory only, be applied successfully in the UK. The calculation and conceptual framework for this method are complicated and sometimes not easily discernible.

South Africa – South African Migration Project (2001)

Introduction

This paper discusses the problem of illegal immigration in South Africa and particularly the prevalence and breadth of 'casual' estimates that are cast around by politicians, officials, and the media concerning the phenomenon. The 'estimates' have increased with the escalated sense of panic surrounding illegal immigration and range from one million in the late 1980s to as high as 12 million more recently. This paper considers each of the categories of irregularity and considers what is actually known about each of them. The paper also presents a set of estimates based on the analysis of illegal population components. This examination is based on a wealth of information including a survey conducted by SAMP in 1997 (in McDonald *et al.*, 1998), border apprehensions data, and various types of permit data.

Method

The report did not suggest one single figure for the total size of the illegal immigrant population but instead sought to analyse the illegal population in terms of its constituent parts and suggest what is known about each sub-group.

The report examines each of the three components of the foreign population in South Africa:

1. *Lawful entrants-unlawful stayers*. This category is broken down into three populations. The first group consists of contract workers who, having entered legally under bilateral agreements, then fall into illegality. The second group are those migrants who entered on a non-work basis and then begin work, and the third those who have entered legally but are working illegally and outstay their residence permit. The SAMP survey also provided 'purpose of entry data' for people on their last visit to South Africa. The number of lawful entrants surveyed who had been to South Africa from Mozambique, Zimbabwe and Lesotho for work purposes was 67, 29 and 25 per cent respectively. The National Movement Control System records all legal entries and exits from South Africa. This allowed the SAMP team to consider which of those entering legally, had overstayed. The data revealed that the number of people with expired permits in 1997 was 658,875. The equivalent figure for the 1992-1994 period was approximately 80,000 migrants *per annum*. The total figure for the lawful entrants-unlawful stayers category was estimated to be 350,000 to 400,000 people at the end of 1996. The number of persons who did not report upon leaving South Africa is likely to be high and therefore these figures are thought to be too large.

2. *Unlawful entrants-lawful stayers*. This category consists of asylum seekers, applicants for the 1996 amnesty, and undocumented migrants legalised for work purposes (Alien Controls Act). This category contains those in a quasi-legal status who are awaiting a decision on their case – for example Mozambican refugees. An estimated 350,000 of these refugees are thought to have come to South Africa in the 1980s, of which 70,000 were repatriated in the early 1990s.

Of those applying for the 1996 amnesty, the vast majority were Mozambicans (73 per cent); the eligibility restriction meant that the majority were those who had had refugee status in the 1980s. The number turned down for legalisation provided a number for those who might remain illegally in South Africa. Another large proportion of people that have quasi-legal status are those in the asylum backlog; the number was thought to be approximately 22,000 in 1998.

3. *Unlawful entrants-unlawful stayers*. This category is thought to be a smaller number than suggested. Firstly, lawful entry is thought to be relatively easy and secondly people's attitudes, as suggested by the SAMP survey, did not correlate to this high degree of illegal movement and residence.

Apprehensions give some indication of the numbers. The South African National Defence Force (SANDF) made 47,031 arrests for illegal border crossings in 1994 and 1995 and they

estimate that they apprehend one in four of the total, although the origin of this estimate is not known. This number gives no indication of the number of illegal residents, only those that cross the border illegally and may be arrested doing so a number of times a year. The SAMP survey revealed that 80 per cent of respondents would not consider going to South Africa if they did not have the correct travel documents. The survey showed that 89 per cent had passports and 72 per cent had visas or permits for entry. This suggests that the scale of unlawful entry and unlawful stay has been overstated.

One of the major findings of the SAMP survey, and one that contradicts much of the assumed wisdom about illegal immigrants, is that residence is not a permanent move for the migrant. The survey showed that only 16 per cent of those questioned thought it very likely or likely that they would live permanently in South Africa, whereas 45 per cent thought it very likely or likely that they would go for a short period of time.

Applicability in the UK

The method disaggregates the illegal population into its component parts. It can be relatively easily done for a country with a limited number of migrant origins which is not the case for the UK. Ultimately it relies on a large-scale survey of migrants. This is not impossible in the UK but would be a complicated and costly exercise.

The Netherlands – Van der Leun, Engbersen and Van der Heijden (1998)

Introduction

The project examined police apprehensions in the four largest cities in The Netherlands – Rotterdam, The Hague, Utrecht and Amsterdam. This work set out to calculate the *stock* of illegal residents in these cities. A comparative estimate using administrative data was not possible; The Netherlands has not had an official population census or regularisation since the 1970s. The estimates of numbers ordinarily quoted are so-called ‘conventional numbers’ which are round figures used widely by the media, which provide “an order of magnitude rather than a count, but they are important because of their potential political impact” (Larson and Sullivan, 1987, p.1475 and Van der Leun, forthcoming). The estimate was undertaken in the hope that an educated guess is an improvement on a conventional number.

This report formed part of a wider study known as the *Unknown City* project that conducted research into the four largest Dutch cities using interviews, ethnographic studies and data analysis over the 1993 to 1998 period. The results are discussed by Engbersen and Van der Leun (2001) in their examination of the relationship between illegality and criminality.

Method

The calculation used the capture-recapture method, a biological research tool that has been adapted for sociological research and is based on mathematical probabilities. Police apprehension data and municipal statistics were examined. The files used gave details of all apprehensions in the cities of Rotterdam, The Hague, Utrecht and Amsterdam in 1995.

An analysis was made of almost 7,000 files that related to the apprehension of all illegal immigrants made in 1995 within the boundaries of the four cities. The files were used to calculate the illegal population by looking at the number of times the same individuals were apprehended. These data were considered the most reliable option on which to base a calculation.

Results

The estimate sets the minimum number of illegal immigrants in the four cities at approximately 40,000, with 17,875 in Amsterdam, 11,069 in Rotterdam, 8,426 in The Hague and 2,677 in Utrecht. These statistics, as shown in Table 4.6, are likely to be higher than suggested by the capture-recapture method but the numbers do provide a rough indication of the scale of the illegal population in the cities even though there is an overlap between *flow* and *stock* figures.

Table 4.6

	Amsterdam	Rotterdam	The Hague	Utrecht	Total
Estimated number of illegal immigrants	17,875	11,069	8,426	2,677	40,047
Total legal immigrant population	232,236	148,322	116,202	48,392	545,152
Illegal as %ge of legal immigrants	7.7	7.5	7.3	5.5	7.3

Source: Van der Leun, Engbersen, and Van der Heijden (1998)

The figures indicate a substantial *stock* of illegal residents in each of the four Dutch cities (7.3 per cent of the legal immigrant population for the same areas). The analysis of the apprehension data for these four cities revealed that the larger cities attract more illegal immigrants. Table 4.6 shows that the cities with the greater legal immigrant population, for example Amsterdam, also have the larger illegal immigrant population. Van der Leun (forthcoming) also notes that there were certain neighbourhoods where these illegal immigrants were concentrated in higher numbers.

Some illegal immigrants may only be present on a temporary basis, others may plan to stay permanently, while some may be in a transitory stage. The chances of being apprehended are dependent upon the activity of the individual; those who live covertly are much less likely to be caught than those who work overtly with other illegal immigrants or engage in criminal activities. An examination of the reasons for initial arrest in Rotterdam for illegal immigrants revealed that the majority of people are arrested for 'illegal residence' itself whereas only a small number were arrested for serious or drug-related offences. This is paradoxical if one considers that the police are not actively searching for illegal immigrants. It would appear that these people are arrested during police spot checks in the workplace or on public transport, during arrests directed at other people (Engbersen and Van der Leun, 2001). This would suggest that the basis of the illegal immigrant estimate is heavily dependent upon the vigilance and rigour of police investigations.

Applicability in the UK

The method is based on police data. There are two main problems relating to the study's applicability to the UK. First, what data the police or the Home Office hold that could be used. Second, the ways in which the police have encountered the target population and how this has changed over time.

Other discussions

There are a number of reports that have discussed the issue of illegal immigration and the need for better data and applicable methods for its scientific assessment, notably in Germany and Spain. This research is born from the need to know more about the illegally resident population and what techniques should be used to shed more light on the situation. These reports do not discuss any one particular method but instead focus on the merits of a number of different strategies that might be used in a particular country. The reports cover the same ground concerning the nebulous concept of illegality and the difficulties surrounding the measurement of illegal immigrants but they highlight important points about the worth of data sources and research strategies.

Germany – Vogel (1999)

Not a great deal of work has been done in the way of illegal estimation in Germany; much of what is discussed is in the form of so-called conventional numbers that are bounced around by the media and officials with very little knowledge of their origin or indeed, quantitative basis (Van der Leun, forthcoming). Much of the work on the subject has had a qualitative focus and has not quantified the number of illegal residents due to the inherent research problems associated with doing so (Vogel and Jordan, 1997; Lederer and Nickel, 1997; Alt, 2001).

Recent figures circulated by the German government ombudsman for foreigners suggest that there are between 500,000 to 1.5 million foreigners living and working illegally in Germany.

Vogel (1999) suggests that a combination of sources provides a more accurate way of estimation and that the data available in Germany could be sensibly applied to estimating illegal residence there. Alt (1999, 2001) suggests scientific estimates of a realistic magnitude are quite possible for Germany.

Data approaches

Legal immigrants who overstay their permit cannot be accounted for as there are no data available to document this. All aliens legally residing in Germany must appear on the Central Aliens Register, including asylum seekers who have made an application. Estimation can be made on this basis but there are complications and gaps in the data. Another complicating factor is that before 1995 those aliens aged under 16 were not required to have visas; the comparison of statistics is therefore problematic.

The use of border apprehension data has been shown to be unreliable in the case of Germany. The BGS (Bundesgrenzschutz) compiles data on the number of persons who are caught crossing the non-EU German borders and who are sent straight back. These numbers are counted but not registered – therefore those persons making repeat attempts are not distinguishable (Vogel, 1999; Alt, 2001). Additionally, asylum seekers who come into the country also make a significant impact on this number.

The use of births and deaths data is a useful tool for estimating illegal residency in Germany; as yet though no one has attempted to use them. For example, Vogel (1999) notes that all births and deaths amongst aliens will be noted somewhere. A comparison between the numbers of *actual* births against the number of *registered* births would be a feasible research strategy and/or the use of death rates of the foreign-born.

Germany has never had a legalisation procedure and so this cannot be used as a source of estimation. Police statistics, however, can be of use; data on migrant criminals can be broken down into those lacking residential status. The use of such data is difficult as an increase in apprehended migrants is not necessarily reflective of an increase in illegal residents but may be due to greater police vigilance.

Face-to-face approaches

Vogel (1999) draws attention to the usefulness of interviews and questionnaires as a source of estimation. Similarly, Vogel and Jordan (1997) comment on the usefulness of qualitative interviews with illegal immigrants as providing a good basis for theoretical reasoning and further empirical research. Whereas illegal migrants are inclined to hide their true status, interviews and questionnaires can yield useful data by comparing and making deductions from the answers to certain questions on date of entry, earnings and reason for staying. There are problems associated with this form of research. Interviewees will not lie more than they have to and so answers to questions will be a mixture of truth and evasion. This poses problems of what to select as reasonably true and also of the representativeness of the interviewees. Many of the problems encountered with interviewing illegal immigrants may be overcome by contacting those persons who are privy to a wealth of information on the subject. Individuals and groups who work directly with illegal residents are essentially the front line of information about this target population. It is generally recognised that support groups, church groups, police auxiliaries and social workers are all much more aware of the scale of the illegal immigrant population than those who are devoid of contact with the group. Such bodies can help provide a low-down on the realities of the situation in a particular town or country, they can give some excellent contacts for snowball sampling and can also be excellent interview partners, bringing confidence and trust to a tense interview situation.

More qualitative work by Alt (1999) in the German city of Leipzig focused on the life situation of migrants. This research provided an overview of the current situation in the city regarding illegal residents and used a methodological framework stimulated by the Dutch study, the *Unknown City*. The research undertook 77 interviews with 35 illegal immigrants and

interviews with contact persons (those with regular contact with illegal immigrants) who provided details about 60 illegal residents who were afraid to make contact with the researcher. Examinations of files pertaining to illegal immigrants were selected at random from official records and interviews were carried out with representatives of federal institutions. The research examined illegality and criminality amongst illegal immigrants. It did not attempt to quantify numbers. It does, however, provide an insight into how one might combine statistics and social networks to provide a more balanced view of the illegal residency situation in a large city.

The work by Alt in Leipzig was part of a three-section study commissioned by the Jesuit Refugee Service to gain an insight into illegal immigration in Europe. The countries that were examined were Germany (Alt, 1999), Spain (Ruiz Olabuénaga *et al.*, 1999) and the UK (Anderson, 1999).

The use of employment surveys in Germany is suggested by Vogel (1999) as a viable research option. Surveys could be used to examine certain employment sectors such as the domestic services sector or the construction sector that are traditionally thought to have a high concentration of illegality both in terms of employment but also that of resident status.

Spain - Instituto Universitario de Estudios sobre Migraciones (2001)

Regularisation programmes since the early 1990s are likely to have reduced the proportion of illegal immigrants in Spain from the levels estimated in the early 1990s (Sarrible, 1996; European Commission, 2000). Gonzalez-Pérez (1990) suggested that legal foreign residents made up about 70 per cent of the total foreign population.

More recently, the Spanish President's office commissioned the *Instituto Universitario de Estudios sobre Migraciones* to examine the issue of illegal immigration, including some of the viable options for estimation.

A survey by the *Instituto Universitario de Estudios sobre Migraciones* revealed that 18 per cent of Moroccan workers and 12 per cent of Peruvian workers were illegally resident in Spain. It is reasonable to assume that the survey is undercounting and there are even more illegally resident Moroccans and Peruvians than it suggests. The extrapolation of these results to other groups would not be possible due to the fluctuation in the numbers of different migrant groups year by year.

Arango *et al.* (2000) in a survey of Moroccan and Senegalese immigrants over the 1996 - 1999 period found that more than 50 per cent of the groups had at some point in their stay been illegal in status. To apply these results to the registered foreign population and to assume that the number of illegal residents is not less than 20 per cent, based on the results of the study, would produce a figure of approximately 160,000 persons illegally present in Spain. The authors do not say if this takes into account the average length of time spent as an illegal resident.

5. Phase 3: Regularisation programmes

Regularisation programmes (also known as amnesties) have been adopted in several countries over the last couple of decades or so. They provide a minimum assessment of the scale of illegality, either in total or in particular groups, in the countries in which they have been carried out. Considerable research is needed on the nature and characteristics of specific programmes and their degree of comprehensiveness before it is possible to consider applying ratios of illegal/legal population found from regularisation programmes in one country to another.

The analysis of regularisation programmes presented here represents only a starting point in their use as an indicator of the scale of the illegal migration stock. The main strength of the results is that we can be reasonably confident that those applying for regularisation are living illegally. Of course, there may be many more people living illegally who do not apply and they would be excluded from the statistics.

What is regularisation?

In most countries regularisation/amnesty is an ongoing process at the individual level, as people with an irregular status approach the authorities to regularise their situations. France, for example, currently regularises more migrants each year than it receives new legal migrants. At the end of 2001 French officials estimated that there were over 76,000 people living illegally who were eligible for regularisation based on family criteria. Other regularisations occur as 'backlog clearance exercises'. In 2000-01 Switzerland allowed into permanent residence 15,000 asylum seekers whose cases were outstanding. In a limited number of countries formal amnesty programmes have been introduced.

What do regularisation programmes tell us about illegal migrants?

Analysis of the characteristics of those regularised allows a profile to be drawn of those migrants in an illegal situation who come forward to apply for legal status. Some of the salient characteristics are indicated below. It would help in checking links between the legal and illegal populations and the estimates derived and also indicate how comprehensive the amnesty has been. It could also suggest whether the profile of a particular country with an amnesty is too dissimilar to the UK to include the results of that regularisation in the generation of an estimate for the UK, although here there would be the unknown of the nationalities of the newest illegal migrants to the UK.

Regularisation and the labour market

The relationship between numbers regularised and numbers working illegally is not clear because not all receiving an amnesty are in the labour market. However, it appears that most are and that in some countries the relationship is direct. For example, in Spain one of the criteria for regularisation relates to sectoral quotas (called 'contingents') in the labour market. In 1997, for example, 5,820 permits were given to hitherto illegal workers in agriculture, 5,620 for domestic service and 2,940 for other services. There are also geographical quotas within Spain, allocated to specific regions. Data from the 2000 Spanish regularisation (Escribano, 2001) indicate that about 15 per cent of those amnestied worked in each of agriculture, construction and domestic service and 11 per cent in hotels and catering. The new 2001 programme in Portugal is seen as part of a transition to a better low-skilled immigration quota system. A new law is designed to liberalise labour migration policy and to regularise those working illegally. Foreigners without visas can be authorised to stay if they have an employment contract. Permits to stay are given for one year, renewable for up to five years. So far, about 100,000 have registered with the labour inspectors, most going to the offices to make their requests.

Geographical origins

Statistics on the origins of regularised migrants show a high degree of concentration of sources. For France, 70 per cent of those regularised have come from Africa, 20 per cent from Asia (excluding China) and most of the rest from China (Garson, 1999). In Spain, the main sources are Morocco, Ecuador, Colombia and Romania. In the most recent Portuguese programme about half are from CEE (especially Ukraine), 20 per cent are Brazilians, ten per cent PALOP (i.e. countries that were formerly Portuguese colonies) and the rest from the Indian sub-continent. The latest Greek programme shows a marked concentration: almost two-thirds were Albanians, followed by Bulgarians and Romanians (Papantoniou-Frangouli and Dourida, 2001). However, new nationalities are emerging: in Italy, Senegalese, Chinese, Albanians and Romanians; in Spain, Chinese and Poles; and in France, Haitians, Zairians and Chinese.

Personal characteristics

Some information is available on the characteristics of those regularised. Analysis of those in France found that about half were married, on average they had lived in France for about six years and that the largest age cohort was 30-34 (Thierry, 2000). The most recent Greek data concur with the French. About half of applicants were married, nearly 40 per cent aged 30-44 and 83 per cent aged 20-44. About 44 per cent had lived in Greece for more than four years and most wanted to stay there long term (Papantoniou-Frangouli and Dourida, 2001).

Educational levels

Regularised migrants have a similar educational profile to legal migrants. About half of the 2000 Greek contingent were educated to secondary level, with women having significantly higher levels of education than men. The majority of those in Spain in 2000 were at a medium educational level, with a similar profile to the equivalent Spanish population. In Portugal the most recent amnesty data suggest that qualifications seem to be higher than those regularised under previous programmes, though their distribution in the labour market is similar, indicating that they are better qualified but not in better jobs.

Regularisation programmes as an indicator of numbers

One of the main sources used as an indicator of numbers of migrants living or working in an irregular situation is the number who apply to regularise their status when an amnesty programme is introduced. Usually a regularisation programme is intended to be a one-off measure in order to deal with a perceived problem of a large number of irregular migrants or migrant workers. However, such programmes have a tendency to become recurrent. If this happens new illegal migrants may be encouraged to enter, hoping they will be able to benefit from the next round of legalisation. For this reason, governments usually state that they do not intend to repeat the exercise. In reality, amnesties breed: most countries that have had one go on to have another.

One by-product of an amnesty is that it usually provides information on the illegal population. By implementing such a programme, the government is able to ascertain the number and whereabouts of irregular migrants, who they are, how they live and work and at what. In effect, the programme provides a means to estimate a minimum number for the stock of the illegal population until they are actually regularised.

Regularisation has affected diverse groups of migrants. Clearly the numbers cannot be equated with the total numbers of people living irregularly at any one time. Nor can it be assumed that the countries which have had such programmes are those with the largest numbers in an irregular situation. Amnesties have never attempted to cover the entire range of illegal migration. Even after successive amendments, the eligibility conditions make such amnesties selective, for example, entry prior to a specific cut-off date, employment or possession of a labour contract.

There are difficulties in determining both the number of aliens claiming regularisation and those regularised. It is not always clear whether the number of applicants includes family members or not, although it appears that in most cases they do. There are also administrative problems. In the French case in 1997, for example, the statistics were produced by prefectures and forwarded to the Ministry. However, many aliens applied to several prefectures in order to increase their chances of success, necessitating checks to remove duplicate entries. The first count produced 180,000 applications, subsequently reduced to 144,000. The number regularised seems to have been under-reported because of data entering defects in prefectures and because many minors were not counted.

The status given to successful applicants also varies. In some cases permanent right to live and work is given. More often, particularly in the case of those who have come in temporarily to work, a short-term (often one-year) permit is offered. This results in the amnestied individual again becoming illegal after one year. Where there are frequent programmes, as in Italy, it is common for the same individual to be recycled from one amnesty to another. In the Italian case it is not possible to check whether an individual has been regularised before and, therefore, how far the programme is picking up new illegal aliens, how far the same people as before.

How many have been regularised?

Amnesty programmes have been a fairly common feature in Mediterranean countries during the last two decades. They have also occurred in the US, most notably with the Immigration Reform and Control Act in 1986. Some of them are ongoing so that up-to-date aggregate results are not yet available. Table 5.1 summarises data from various regularisations. Analysis of regularisations up to the beginning of 2000 (Apap *et al.*, 2000) suggests that the total number regularised in the programmes of Greece, France, Spain and Italy was 1.75 million. During 2000-01 further programmes occurred. In these Greece has had over 350,000 applications and Spain 314,000, though it is not yet known how many of these have been approved. A new programme in Portugal in 2001 has so far brought in 100,000 applications.

Numbers regularised provide only part of the story. The numbers of applicants provide a better indicator of the real level of illegality. However, these will vary according to the timing, the conditions which are attached to a change of status and the degree of flexibility with regard to personal circumstances applied by officials dealing with individual cases. As a result, some amnesties have drawn out relatively restricted numbers (for example, the French amnesty in 1981-82 was aimed only at foreign workers living illegally and who had stable employment and a contract of work) while in other cases, where the criteria for acceptance have been broader, the number applying has been greater.

TABLE 5.1: Regularisation data, various dates, European countries, thousands

France	<i>1981-82</i>	<i>1997-98</i>			
(a) applications for regularisation	150	152			
(b) total recorded foreign population	3,714	3,597			
(c) ratio a/b (per cent)	4.0	4.2			
Belgium	<i>2000</i>				
(a) applications for regularisation	60				
(b) total recorded foreign population	862				
(c) ratio a/b (per cent)	7.0				
Greece	<i>1997-98</i>				
(a) applications for regularisation	397				
(b) total recorded foreign population	165				
(c) ratio a/b (per cent)	224.0				
Italy	<i>1987-88</i>	<i>1990</i>	<i>1996</i>	<i>1998</i>	
(a) applications for regularisation	119	235	259	308	
(b) total recorded foreign population	645	781	1,096	1,250	
(c) ratio a/b (per cent)	18.4	30.1	23.6	25.6	
Portugal	<i>1992-93</i>	<i>1996</i>			
(a) applications for regularisation	39	22			
(b) total recorded foreign population	171	168			
(c) ratio a/b (per cent)	22.8	13.1			
Spain	<i>1985-86</i>	<i>1991</i>	<i>1996</i>	<i>2000</i>	<i>2001</i>
(a) applications for regularisation	44	135	21	127	314
(b) total recorded foreign population	293	361	539	896	896
(c) ratio a/b (per cent)	15.0	37.4	3.9	14.2	35.0
US	<i>1986</i>				
(a) applications for regularisation	2,685				
(b) total recorded foreign population	11,770				
(c) ratio a/b (per cent)	22.8				

6. Conclusions

The indirect and direct methods discussed in this report are of varying use to the estimation of the illegally resident population in the UK. A range of methods has been reviewed; some attempt direct measurements, others indirect. Several of these methods involve comparisons of sources, usually some kind of register and a population census. Direct methods tend to involve special surveys, normally of employers. In most cases subsequent verification of the estimates derived is either difficult or impossible. The applicability of these methods in the UK is dependent upon data availability and the ability to implement the assumptions that the method commands.

Some of the studies discussed attempt to assess the scale of the illegal stock among particular groups or in particular (usually urban) places. In some of these cases this exercise then forms the basis of extrapolation to the number in the population at large. In other cases, notably the US studies, an attempt is made from the outset to calculate the size of the total illegal population. It is probably true to say that the main value of the former lies less in the extrapolation and more in what they can tell us about the groups that are the object of study.

Most of the methods discussed are either not applicable in the UK or the results produced are not accurate enough. The most obvious examples are those relying on the availability of a population register, either of the whole population or one for foreigners. The best hope appears to be the residual method, as applied in the US. It should be possible to apply this in the UK, based on a comparison of the 1991 and 2001 census results and on estimates of the numbers of immigrants and emigrants in the various categories. The US Census Bureau estimate (2001) used separate research teams to examine each migration component and the results were combined for a final calculation. It seems reasonable that this technique could be employed successfully in the UK, although like the US it would clearly benefit from revisions and readjustments over time. It is important to remember that the US is well advanced in the quantitative consideration of illegal immigration; it has developed and refined the methods available since the late 1970s (Van Hook and Bean, 1998). For the UK, perhaps the main question mark relates to the accuracy of the 1991 census as a basis for the calculation of change over time. The newly available results from the 2001 census pose certain questions in this regard. It will be necessary to check if and how far the 1991 and 2001 censuses can provide a valid starting and end point.

Some of the indirect measurement methods may offer potential possibilities. Those based on police records, as in the capture-recapture method, depend on the availability of police and Home Office data. If they are available for the UK, a pilot study would be appropriate in selected urban areas.

More direct measurements can be attempted through surveys. Several studies have used the Delphi method as an alternative to direct surveys. For example, the Swiss study discussed earlier in the report was preliminary, but highlighted the benefits of determining a cumulative opinion of a number of people through the use of the Delphi method. The Swiss study was aimed at employers and attempted to assess the degree of illegality amongst the workforces of various industry sectors. It could be applied in the UK on a much larger scale on an anonymous basis and could be targeted at researching all illegal immigrants or those employed illegally. The method is used to synthesise the opinion of a wide range of people who are privy to information on illegal immigrants; this group may include NGOs, social workers or church groups as suggested by Vogel (1999). The Delphi method could be used in conjunction with the quantitative analysis of police apprehension data as done in The Netherlands in the *Unknown City* project, to form a holistic picture of the problem and provide estimates of illegal immigrant stocks. Indeed, it seems reasonable to assume that a combination of methods is one of the best ways to estimate the size of the illegal immigrant population and to ascertain the profiles, trends and problems in that population.

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Errata

Page 3, the word 'cupertino' amended to 'co-operation'