

## **Reconciliation of ONS estimates: Comparisons of combined IPS (long and short term migration) estimates with administrative data sources**

### **Executive Summary**

Counts of new people joining administrative sources, such as national insurance number allocations or patient registers, from overseas, can be used as a proxy for counts of new international migrants entering the UK. These counts are known to differ from estimates of long-term migration based on the International Passenger Survey (IPS) made by the Office for National Statistics (ONS). Much of this difference is thought to relate to administrative sources covering moves made for shorter lengths of stay than the 12 month minimum used by ONS to define a long-term migrant.

In October 2007 ONS published a first set of experimental estimates of short-term migration based on the International Passenger Survey (IPS). These estimates refer to visits lasting for between one and twelve months. Combining short-term migration estimates with the existing IPS based long-term migration estimates to produce a set of Long & Short Term Combined estimates (LSC) enables more direct comparisons to the counts from administrative sources to be made. This paper reports results of these comparisons at a national level between LSC estimates and three key administrative sources (patient registrations, national insurance number allocations, and the worker registration scheme). These comparisons are for the periods for which short-term migration estimates are available, mid-2004 and mid-2005 or calendar years 2003, 2004 and 2005.

Initial comparisons showed that national insurance number allocations to overseas nationals were higher than LSC estimates of worker migration. Two factors were identified that contributed to this:

- A review of the method used to produce the experimental short-term migration estimates identified that these estimates were low, in particular the estimates of visits made for employment. As a result of this assessment improved short-term experimental estimates are being re-released on 20 May 2008. There is no impact on the long-term migration estimates as a result of this review.
- National insurance numbers are issued to migrants if they work or claim benefits at any point during their stay in the UK regardless of what their main reason for visit was when first entering. The IPS measures migrant workers who state employment as their main reason for entering the UK.

A third factor is also explored in the paper relating to the estimation of migrants who change their intentions after arrival though this is a smaller affect.

The LSC estimates used in comparisons with administrative sources were updated to reflect the changes to the experimental short-term estimates. The updated LSC estimates of migrants whose main reason for visit is employment are more comparable to the data on national insurance numbers allocated to foreign nationals. A number of recommendations are made as a result of this work.

## 1. Introduction

1.1 Official UK estimates of international migration are based on the United Nations (UN) definition of a long-term migrant, that is, someone who changes their country of residence for at least a year so that the country of destination effectively becomes the country of usual residence. This means that people migrating for periods of less than a year, defined as short-term migrants, are excluded from official migration and population estimates. The main source of data for long-term migration estimates is the International Passenger Survey (IPS).

1.2 Recently, concerns have been expressed about the exclusion of short-term migrants from official migration estimates. This has become an important issue since the enlargement of the EU in May 2004 and the increased flows from Eastern Europe that have resulted, e.g. from Poland in particular. Information about the numbers of short-term migrants is important to economists and those delivering local services. In response to this emerging requirement, a set of experimental short-term migration estimates covering England and Wales was published in October 2007<sup>1</sup>. These estimates are in respect of migration for lengths of stay from one month to a year and are based on IPS completed flow data (i.e. migrants are asked how long they spent in the UK when they leave). The long-term estimates are also based on the IPS, but use intended flow information at start of migration.

1.3 The availability of short-term migration estimates provides an opportunity to compare the estimates produced by ONS with other migration related administrative data sources, namely:

- New registrations with General Practitioners (Flag 4s) captured from the Patient Register Data System (PRDS)
- National Insurance number allocations (NINOs) to overseas nationals
- The Worker Registration Scheme (WRS) for migrant workers from the EU accession states

In order to achieve these comparisons ONS' estimates of long and short-term migration are combined, as the counts provided by these administrative sources relate to all lengths of stay. The administrative sources are not able to differentiate between long and short-term migrants as they do not record information on a migrants' actual length of stay.

1.4 This paper builds on previously published research exploring how counts from administrative sources might be used in estimating international migration<sup>2</sup>. The purpose of this paper is to report an exercise to reconcile ONS estimates (combined long and short-term migration estimates) with counts of international migration identified by foreign nationals registering on administrative sources. This paper does not aim to achieve a complete reconciliation as there are other factors, apart from length of stay, that complicate direct comparisons. For example, IPS estimates are subject to sampling error and there are remaining difficulties with aligning data sources to same reference periods. However, the

reconciliation exercise provides a better understanding of all sources. Throughout this paper these combined figures of long and short term migration are referred to as LSC (Long Short Combined) estimates.

1.5 The following section summarises comparisons of LSC estimates to counts of international migration identified on the three administrative sources noted in 1.3. Section three explains likely reasons for these discrepancies and how this has led to improvements to the experimental short-term migration estimates. Section four summarises recommendations made as a result of this paper.

## **2. LSC Estimates in Comparison to Counts from Administrative Sources**

2.1 The exercise to reconcile ONS international migration estimates with administrative sources compares LSC estimates to counts of international migration identified from GP registrations data (Flag 4s), National Insurance Number allocations (NINOs) and Worker Registration Scheme data (WRS). Full details of these comparisons, further analysis and issues surrounding them can be found in Annex A.

2.2 In summary, LSC estimates have been shown to be higher than Flag 4 registrations for each of the mid-years 2004 and 2005. The most plausible explanation is that some migrant groups, particularly young adult males and those staying in the UK for shorter periods are less likely to register with a GP than those staying longer. It is also possible that returning British nationals may have retained their previous GP registration and are therefore less likely to be identified in the Flag 4 data. In contrast, NINO allocations to overseas nationals are higher in each year than LSC employment migration estimates and it was particularly noticeable that the LSC employment migration estimates are dominated by long term migration. More work was needed to gain an understanding of the results of these comparisons as well as to develop the experimental short-term migration estimates. The comparison with WRS data has shown that similar differences exist for migrants from A8 countries, migrating for work related reasons, to those observed from comparisons with national insurance numbers. The next section will explore why these differences may occur.

## **3. Explaining the differences**

3.1 In exploring the reasons for differences between sources, and as part of the process of further developing the method for producing short-term migration estimates, particular emphasis was on why the LSC work related estimates are low in comparison with NINOs and WRS. Three specific factors were explored further; these are:

- the method used to produce experimental short-term migration estimates
- the treatment of multiple reasons for visit in LSC estimates
- the estimation of visitor switching in long-term estimates.

### 3a. Experimental Short-Term Migration (STM) estimates

3.2 The detailed review of the methodology and processing of STM estimates found that some records had been excluded from the experimental estimates. These records were ones which had missing data on UK location of stay and a large proportion were short-term migrants coming to work. There were two types of missed records:

- Those who had no recorded UK location. These were migrant workers with a definite job to go to in the UK. They had no recorded location as the IPS did not ask this question to this category of migrant worker as the information was not required for ONS' Travel Trends publication<sup>3</sup>, which is where the data were used previously.
- Those where location had been recorded as 'UK Unspecified'. These occurred for all reasons for visit.

In order to create improved estimates for England and Wales, the methodology has been amended to impute a location for the records where this information is missing. The missing records are randomly allocated a location of stay (either 'England and Wales' or 'not England and Wales') according to proportions implied by the available data. This assumes that short-term migrant workers have the same likelihood of visiting England and Wales as all other migrants. At this point there is no other evidence available on which to base an alternative assumption. It should be noted that this issue only affects short-term migrants and does not affect long-term migration estimates.

3.3. Table 1 shows the impact of the missing records by presenting figures both including and excluding these data.

**Table 1: Impact of changes to STM experimental estimates (1-12 months) for mid-years 2004 and 2005, England and Wales (thousands).**

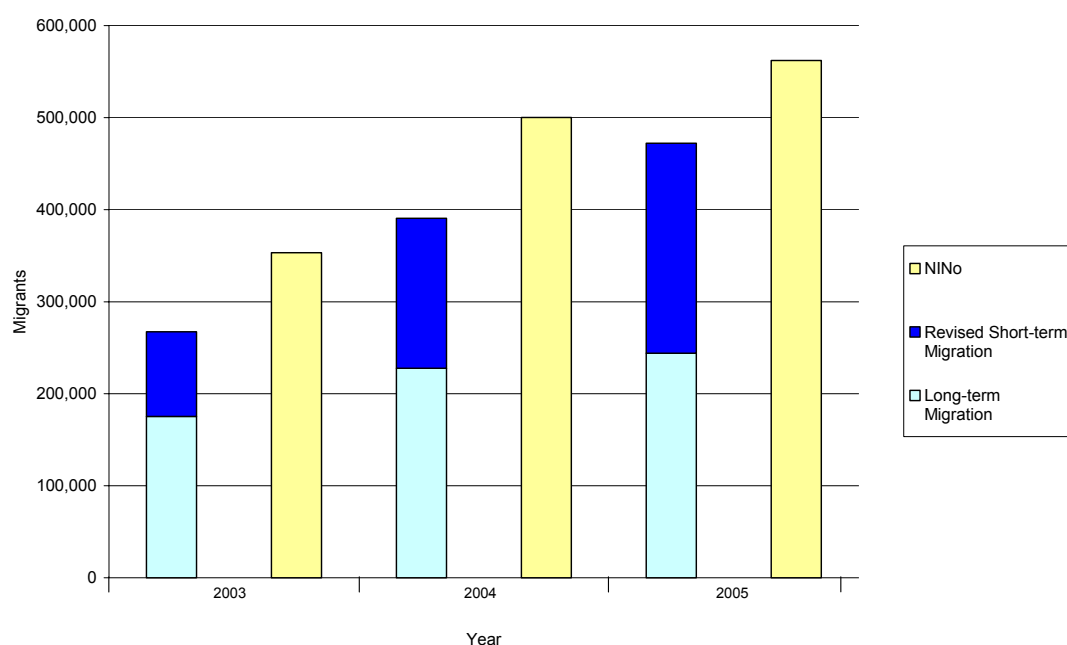
Reason for Visit	Mid-2004			Mid-2005		
	Previous	New	% increase	Previous	New	% increase
Employment	40	113	183	78	175	124
Study	195	218	12	170	193	14
Other	677	791	17	771	878	14
All	912	1,122	23	1,018	1,246	22

3.4. The impact is most apparent for migrants who move for employment. In 2004 the estimate of such visits from all countries increased from 40,000 to 113,000 (183%) and in 2005 from 78,000 to 175,000 (124%). The impact is much less for moves made for study or 'other reasons' (visits to friends/family, tourist visits etc).

3.5 With these revised STM estimates it is possible to update the LSC estimates and the comparisons with administrative sources such as with NINo allocations to overseas nationals that is presented in figure A2 of Annex A. This updated comparison is presented in figure 1

and shows greater comparability between the sources than there was based on previous short-term experimental estimates. However, the LSC estimates are still lower than NINo allocations. As noted previously there is an expectation that the LSC estimates should be higher since migrant workers coming to the UK more than once would not appear in the NINo allocations data. Hence it is important to consider other potential causes of these differences.

**Figure 1: Revised work related LSC estimates and NINo allocations to overseas migrants for calendar years 2003 to 2005 (UK Level).\***



\* For all sources, data on the location within the UK is not perfect, and thus these comparisons with administrative data are mostly reported at the UK level.

### 3b. Reason for visit

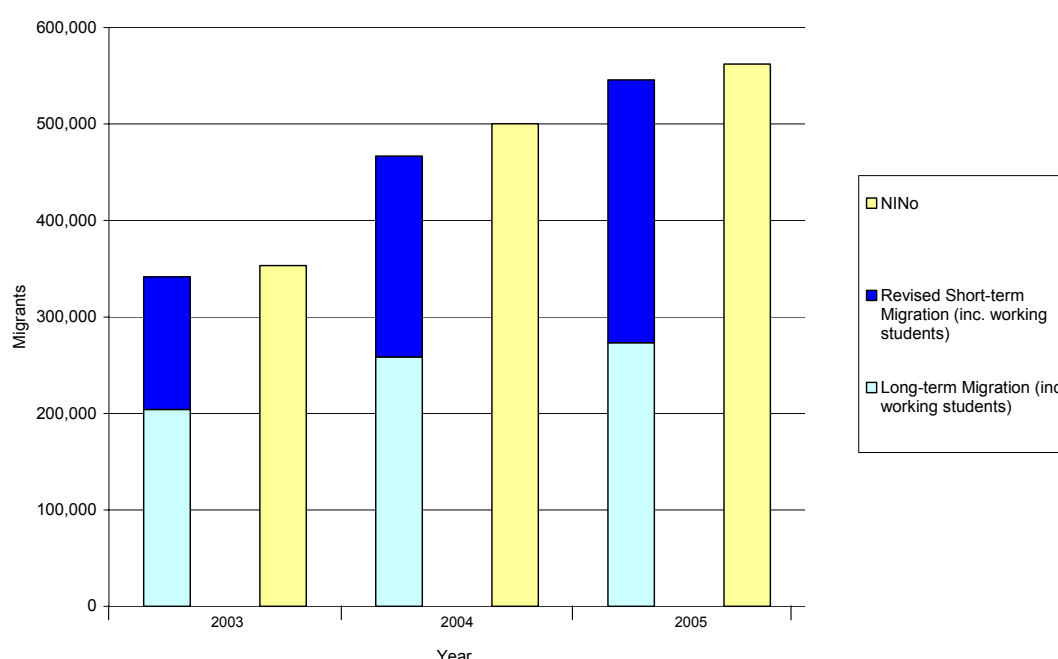
3.6 Currently, the IPS only records a migrant's primary reason for coming to the UK. In contrast the only information collected on the NINo data is whether at any point during their stay the migrant registered for a NINo to allow them to work or claim benefits. Differences between sources will arise when an individual decides to take up employment after coming to the UK and so did not state this to the IPS interviewer as their main reason for visit on entry to the UK. In this case the individual would be allocated a NINo but the IPS would not have recorded a work related reason for migration. Similarly the WRS will register A8 migrants if at any point during their stay the individual intended to work. This issue can be referred to as individuals who have multiple reasons for visit.

3.7 Evidence about individuals who move to the UK for multiple reasons is most readily available for students who work. Data from the 2001 Census show that 21.5% of those of working age who came to England and Wales (from outside the UK) to study in the year

before the Census were also in employment, or actively seeking employment. More recent evidence from the 2006 Annual Population Survey (APS) shows that 34% of full-time, foreign born students were in employment. However, students in halls of residence are currently excluded from the APS, which could be biasing this estimate. For this reason, the more conservative 2001 Census based estimate has been used to create an adjustment of 21% for students also in employment.

3.8 Given the evidence presented, LSC estimates of employment immigration have been increased by 21% of student immigration to account for IPS respondents who said their main reason for visit was study but who were also working. Figure 2 shows how this new LSC estimate compares to NINo allocations. While this relatively crude adjustment requires further research, this shows that the LSC estimates now compare very closely to the NINo allocations data.

**Figure 2: Revised work related LSC estimates (including an adjustment for working students) and NINo allocations to overseas migrants for calendar years 2003 to 2005. (UK level)**



3.9 A further insight into the issue of multiple reasons for visit is provided by considering when an individual registers for a NINo and when they first arrived in the UK. The Department for Work and Pensions (DWP) state that numbers of arrivals are not robust until at least 15 months after the year to which they refer, many arrivals take at least a year before registering for a NINo<sup>4</sup>. Among the reasons cited for this delay are that some migrants study before seeking work or live as a dependent before eventually applying for a NINo themselves. A total of 500.2 thousand NINOs were allocated to overseas nationals who entered the UK in the tax

year 2004/5. However of this total only 211.8 thousand of the NINos were allocated in that year, 240 thousand were allocated in 2005/6 and 42.9 thousand in 2006/7. If employment was a migrant's main reason for entering the UK they would need to acquire a NINo soon after they arrived.

3.10 Multiple reasons for visit are potentially an issue for both long and short-term migration estimates. In addition, short-term migrants who extend their stay in the UK and become long term migrants (i.e. visitor switchers) may also change their initial reason for migrating to the UK. The current switching methodology does not account for those whose reason for visit might change. For example, someone intending to stay in the UK for 10 months to study may find employment after their studies and decide to work in the UK for a further 4 months. Although an adjustment is made for the switch in intentions on length of stay, adjustments are not made for this type of change in employment status.

3.11 Though some limited data have been presented on multiple reasons for visit it is apparent that further analysis is required to make a fuller assessment. Introducing questions on the IPS may help to identify those migrants who have multiple reasons for visit or those whose intended reason for visit changed during their stay. Questions might also be introduced to specifically identify whether individuals are registered or intend to register with administrative sources such as patient registers or NINos. It is recommended that the development of such questions be taken forward as part of the ONS' Port Survey Review.

### **3c. Visitor switching**

3.12 Estimates of long-term migration are based on IPS data sampled when individuals first enter or leave the UK and so are based on initial intentions. In making long-term migration estimates an adjustment is made to account for individuals who change their intentions. The adjustment made for individuals who intend to stay for less than twelve months but actually stay longer is referred to as the 'visitor switcher' adjustment.

3.13 Following a recommendation of the National Statistics Quality Review on International Migration<sup>5</sup> ONS introduced new questions in the IPS in 2004 to identify visitors who change their intentions. A new set of adjustments have been developed using these data and were implemented in the 2006 long-term migration estimates<sup>6</sup>. An overview of the new adjustment method is provided in annex C.

3.14 A technical issue has been identified relating to the practice of using 3-year smoothed distributions to estimate the visitor switcher adjustments for citizenship groups. Smoothing is generally used to reduce variability in the data and provide a better reflection of long-term trends. However, it may also smooth out actual changes. There is evidence that use of 3-year smoothing has smoothed out some of the migration trends following EU accession in 2004.



Specifically, the current methodology involves estimating the total EEA flow and then distributing that flow based on a three year average of EU15, A8 and other EEA. This means that, the visitor switcher estimate for 2005 incorporates some data from before accession. This has resulted in underestimating A8 flows and overestimating EU15 flows in the three years following EU expansion in 2004. If unsmoothed data were used this would have added an additional 5,000 to A8 flows in 2005 and an additional 7,000 in 2006 although there would have also been a similar drop in the estimates for the EU15, as this issue does not affect total numbers of visitor switchers. It is recommended that further work is done to assess the feasibility of changing the methodology to remove three year smoothing. Any required revisions would then be introduced as part of a wider package of improvements for the mid-2008 population estimates, published in 2009 or 2010.

Further details on the methodology for estimating visitor switchers and the 3-year smoothing issue are provided in Annex C.

#### **4. Conclusions**

4.1 This paper has, for the first time, considered how combined IPS estimates of long and short-term immigration (LSC estimates) compare to counts from administrative sources. Initial comparisons identified a particular difference between LSC (Long and Short Combined) estimates of immigration for employment and either NINo allocations to overseas nationals or WRS registrations to A8 migrants. Given that both these administrative sources are primarily measuring employment migration that was the focus of further work. After taking account of revisions to short-term migration and measurement issues relating to multiple reasons for visit, comparisons show that LSC estimates are broadly comparable to administrative sources.

4.2 The key recommendations from this work are:

- The IPS should collect information on where short-term employment migrants stayed when they visited the UK.
- The IPS questionnaire be supplemented with questions to capture multiple reasons for visit. These question changes are being introduced as part of the ONS' Port Survey Review.
- That ONS assess the feasibility of changing the smoothing methodology used for estimating visitor switchers for potential implementation with other improvements to mid-year estimates in 2009 or 2010.

## References

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## **Annex A: LSC Estimates in Comparison to Counts from Administrative Sources**

Administrative sources are not primarily designed for statistical purposes. The coverage of international migrants joining an administrative source will depend on the purpose of the particular administrative system and will invariably differ between sources. They will cover both short and long term migrants. It is necessary to combine the appropriate elements of the IPS-based long and short term migration estimates to match the coverage of the administrative source as closely as possible. An explanation of all the sources and exactly how the combined estimates have been derived is provided in Annex B.

This section orders the comparisons of administrative source to LSC estimates from the wide to the narrower coverage of the administrative sources. Hence comparisons are first made between LSC estimates and patient registration data since anyone who has been, or intends to reside in the UK for longer than 3 months may register with a GP, regardless of age or reason for migrating\*. The second set of comparisons is between LSC estimates and NINo allocations as only migrants over 16 years of age planning to work or claim benefits require a NINo. WRS registration data has the narrowest coverage and so is the third source to be compared to the LSC estimates. Only citizens from A8 countries (i.e. those that acceded to the EU in 2004) are required to register with this source.

Two further issues with these administrative sources are noted:

- Very little information is collected on international migrants leaving the UK. The implication of this is that no information is provided on length of stay and so no distinction can be drawn between long and short-term migration. It is therefore not possible to identify whether any discrepancy between LSC estimates and the administrative sources relates to long or short-term migration.
- If an individual migrates more than once, either as a short or long-term migrant, they are unlikely to register twice with the administrative source. For example, an individual visiting the UK for employment for two separate four month periods would only require one NINo. In contrast the LSC estimates will treat this as two separate short-term migration events.

### **Comparisons with Patient register 'Flag 4s':**

Figure A1 presents the England and Wales level comparison between Flag 4 data and LSC estimates for the 2004 and 2005 mid-year periods. Flag 4 data is based on a mid-year

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\* It is noted that the minimum length of stay required for registering with a GP is 3 months whereas a NINo is required regardless of length of stay. Furthermore, there is no legal requirement to register for health services whereas a NINo is required for individuals to legally work.

snapshot of GP patient registers. It is only available on a mid-year basis. The comparison has been made for the two mid-years for which short-term migration estimates are available (2004 and 2005). The short-term migration estimates are based on a 3 to 12 month length of stay to provide the closest match to definitional basis of the patient registers.

**Figure A1: LSC estimates compared to Flag 4 data, 2004-2005 mid-year. (England & Wales)**

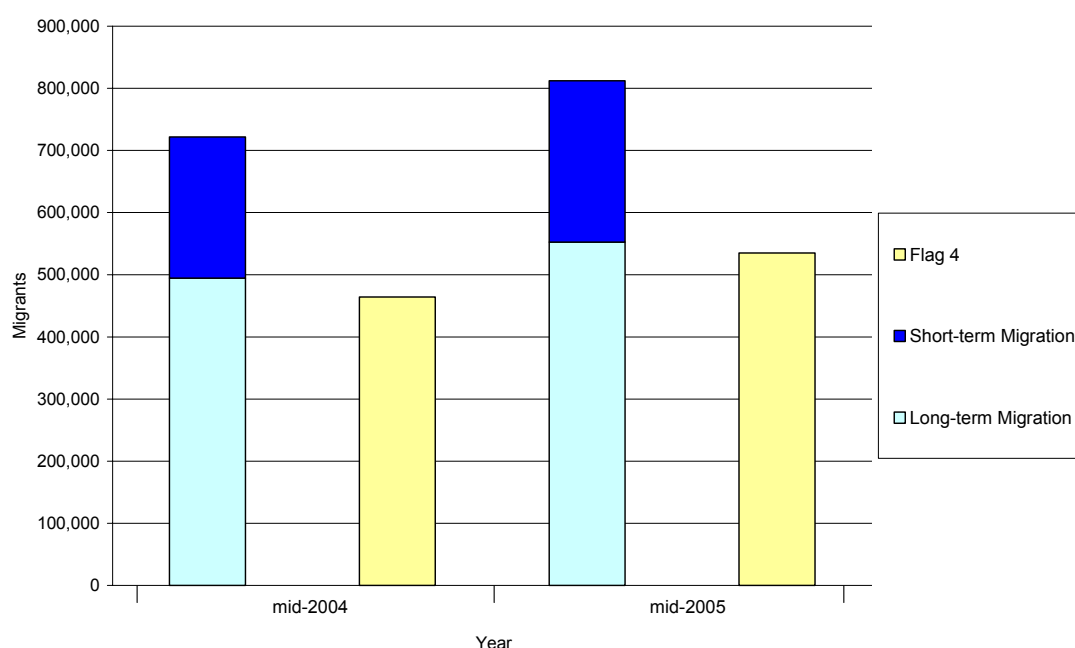


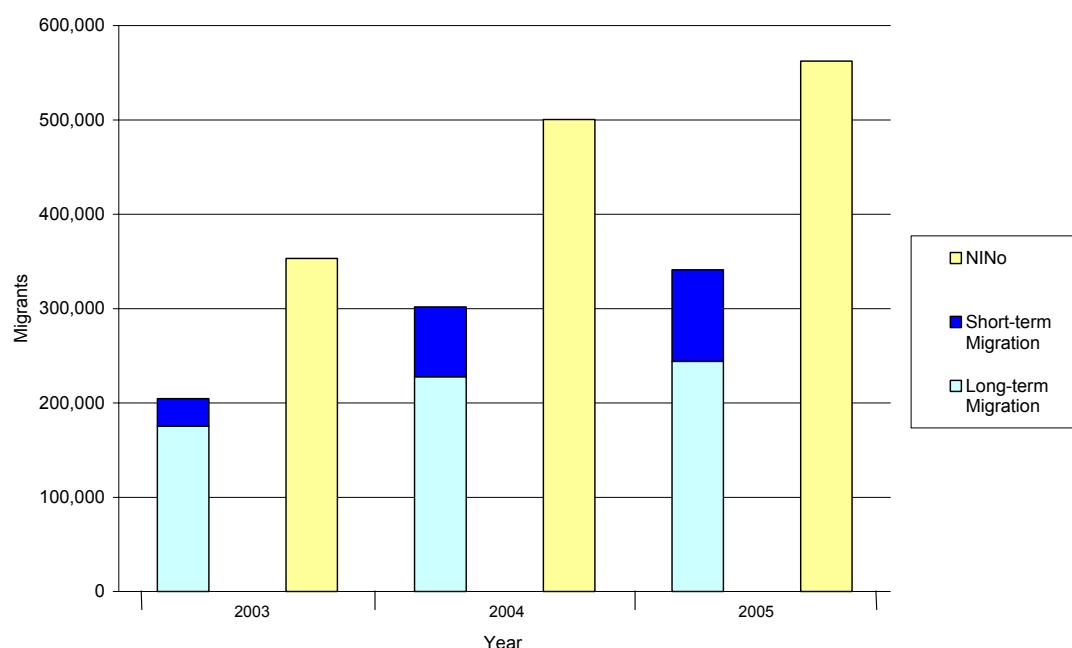
Figure A1 shows a noticeable increase in both the LSC estimates and Flag 4 count between the two mid-year periods. The start of the mid-2005 period roughly corresponds with an influx of EU accession migrants following EU expansion on 1 May 2004. Also, the comparison shows that the LSC estimates are over 50 per cent higher than Flag 4 registrations. Indeed, the Flag 4 count is just slightly less than the long-term component of the LSC estimates. This difference can be mostly explained by the fact that GP registration is not compulsory. Some migrants will only register with a GP if and when they require medical attention. There may also be a lag between the migration event and eventual GP registration. It is also well documented that young males, who make up a large proportion of migrants, are less likely to register with a GP than other groups<sup>7</sup>. Therefore, it is reasonable to assume that many short term migrants (and some long term migrants) will not register with a GP during their stay in the UK. These different registration patterns across migrant groups may also affect sub-national comparisons. It is not possible to make local comparisons as short-term migrants (and hence LSC) are not available for local areas. However, if it were possible then it is expected that individual areas would not necessarily mirror the national pattern and there would be variability between areas at this level.

## **Comparison with NINos**

A comparison between LSC estimates and NINos at UK level is shown in Figure A2. For all sources, data on the location within the UK is not perfect, and thus these comparisons with administrative data are mostly reported at the UK level. LSC estimates for this comparison are based on those who stated work related reasons as their main reason for migrating. NINos are allocated to all those in UK employment, including the self-employed. Those claiming benefits, but not in employment will also be allocated a NINo. However, in 2006/07, the proportion of NINos allocated to foreign nationals who were not in work, or actively looking for work was less than 1%<sup>4</sup>, and so the impact of their exclusion from the LSC in this comparison will be minimal. Published NINo counts are only available on a tax year basis; LSC estimates can be produced on either a calendar or mid-year basis. The comparison in Figure A2 is with the LSC estimates on a calendar year basis and so the NINos data refer to the 12 month period beginning just over three months after the period that the LSC estimates refer to. The short-term migration estimates here refer to work related moves made for between 1 and 12 months since NINos will be allocated even to those coming to work for a very short period.

The number of NINos allocated to foreign nationals was about 65 to 70 per cent higher than LSC estimates of migrants coming to the UK for work related reasons in each of the three years. This is in contrast to the Flag 4 comparison where the counts of international migration from the administrative data were lower than the LSC estimates. Both NINos and LSC estimates show a noticeable increase during this period. EU accession occurred part way through 2004 and so this year will include both the pre- and post-accession periods.

**Figure A2: LSC estimates (by components) compared with NINo allocations to foreign-born migrants, 2003-2005. (UK level)**



Again, there are a number of caveats that should be noted:

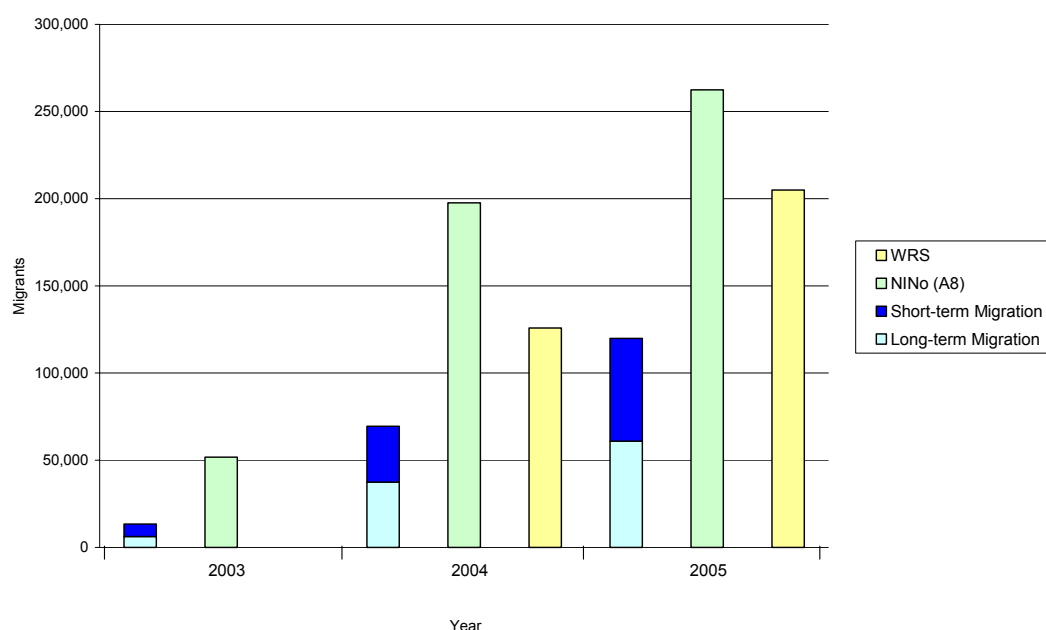
- The different reference periods for each source prevent direct comparisons. The NINo data refers to a period beginning just over 3 months after that for the LSC estimates.
- NINo data are based on when applicants first entered the UK rather than when they registered for a NINo. Although this helps improve comparability by better aligning the NINo data with migration events measured by LSCs estimates, it does not address the problem of work status changes. For example, a person who did not initially enter the UK to work and subsequently joins the UK workforce would eventually be counted in the NINo data at time of entry, but not in the LSC estimates of those coming to the UK to work.
- Similarly, migrants stating a non-work related reason for migration (e.g. students) but who also work while studying will be counted in the NINo data, but not in the corresponding LSC estimates. At present, the IPS only captures the “main reason” for migration, and so can not identify multiple reasons. Further discussion of this particular issue and an attempt to adjust for these multiple reasons is presented in Section 3.

### **Comparisons with WRS (A8s)**

As detailed in Table B1, the LSC estimates compared to the WRS counts will be based on those migrants with A8 citizenship who came to the UK for work related reasons. The experimental short-term migration estimates used in this section (as a component of the LSC estimates) are unpublished estimates by citizenship. These estimates are not sufficiently

robust to publish in their own right and this may affect the validity of these comparisons. Figure A3 shows the comparison between LSC estimates and WRS data, at UK level, in the years 2003 to 2005<sup>†</sup>. It also shows the equivalent number of NINos issued to A8 citizens.

**Figure A3: LSC estimates (by components) compared to WRS registrations and NINo allocations to A8 migrants for calendar years 2003, 2004, and 2005. (UK level)**



Looking first at the NINo counts of those from A8 countries versus the WRS counts, the WRS figures are noticeably lower. One contributing factor for is that the NINo figures will include the self-employed who are not required to register with the WRS. Separate figures for these self-employed have not yet been published and so an adjustment can not yet be applied. Comparing the WRS count and the LSC estimates, the WRS figures are much higher. For example, 2005 was 104,000 higher than the LSC estimate (almost twice the size). Despite these large discrepancies all the sources show substantial increases for the three years. Clearly, EU accession is the main factor behind these increases.

LSC estimates presented in figures A2 and A3 clearly differ in terms of the proportion of moves which are long and short-term. The clear majority of moves made for employment by foreign born (figure A2) are for more than 12 months whereas employment moves from A8 countries appears to be more evenly split between long and short-term moves. The estimates of short-term migrants used in figure A3 are subject to a wide margin of error.

<sup>†</sup> The WRS is part of the transitional arrangements that the UK government put in place to regulate access to the labour market for migrants from states that joined the EU on May 1<sup>st</sup> 2004. No WRS data was therefore collected for the year 2003.

## **Summary of LSC comparisons to administrative sources**

LSC estimates have been shown to be higher than Flag 4 registrations for each of the years mid-2004 and mid-2005. The most plausible explanation is that some migrant groups, particularly young adult males and those staying in the UK for shorter periods are less likely to register with a GP than those staying longer. In contrast, NINo allocations to overseas nationals are higher in each year than LSC employment migration estimates. The comparison with WRS data has shown that a similar discrepancy exists for migrants from A8 countries migrating for work related reasons. Section 3 of the paper explores reasons for these discrepancies to occur, and particularly why LSC estimates of employment immigration appear to be too low.

International migration to the UK has increased over the period 2003 to 2005 on each of the datasets used in this paper. Given EU expansion in May 2004 such an increase would be expected.



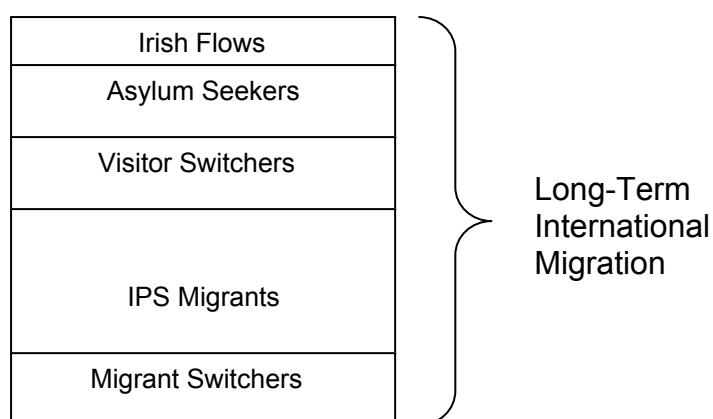
## Annex B: Overview of Data Sources

### LSC Estimates of Migration

The ONS long-term migration estimates include additional flows and adjustments not captured by the International Passenger Survey (IPS). These are shown in Figure B1. The IPS estimate, by far the largest component, is based on surveying the intentions of individuals at the beginning of their stay since some migrants will never return to their country of previous residence or will only do so after a number of years. Inevitably, however, some individuals will change their intentions after arriving. Therefore, adjustments are made for individuals who intend to stay for less than a year but end up staying longer (visitor switchers) and individuals who intend to stay for longer than a year but end up leaving earlier (migrant switchers). The other components are:

- Asylum seekers not captured by the IPS which are estimated using administrative data from the Home Office
- Flows between the UK and the Republic of Ireland which are estimated using data provided by the Irish Central Statistics Office

**Figure B1 – Components of ONS International Migration Estimates**



The IPS is also the basis for short-term migration estimates. However these data are based on interviews when migrants complete their stay and return to their country of usual residence. For this reason, it is not necessary to adjust for changing intentions. Short-term migrant estimates do not include flows from the Republic of Ireland or asylum seekers. Although these are potential causes of discrepancy, Irish flows are relatively small (assuming a similar pattern to long-term migration), while those seeking asylum who stay in the UK for less than a year are usually failed asylum seekers who would be removed from the UK without being captured by these administrative sources. LSC estimates consist of the ONS

Long-term International Migration estimates plus the IPS based short-term migration estimates.

As described in previous research<sup>2</sup>, the populations covered by administrative sources differ from those measured by ONS migration estimates. Hence, a different set of LSC estimates need to be compiled in order to most closely align with the coverage of each administrative source. The following provides a brief overview of each source.

### **Administrative Data Sources:**

#### **Patient Register - Flag 4s:**

Flag 4s are the first registration with a GP in England and Wales captured from the PRDS. Generally, international migrants can not register with a GP unless they have been, or intend to be resident in England or Wales for at least three months. Registrations will include migrants from the Republic of Ireland and asylum seekers. Therefore, the best LSC comparison with Flag 4s will be achieved by combining the short term estimates of migration lasting 3-12 months with TIM (long-term migrants). A small number of 'Flag 4s' will not be international migrants, namely, those registering with a GP after moving from Scotland or Northern Ireland to England or Wales for the first time. However, such moves will not noticeably affect this comparison.

#### **National Insurance Number allocations to overseas nationals (NINOs)**

NINOs allocated to overseas nationals primarily record those who intend to work but will also include a small number only claiming benefits<sup>‡</sup>. NINOs are allocated to overseas nationals regardless of length of stay and also include migrants from the Republic of Ireland. However, asylum seekers are excluded as they are not able to work until their application approved while state support is provided through a different system<sup>§</sup>. Therefore, the best LSC comparison with NINOs allocated to foreign nationals is achieved by combining the LSC estimates of short term migration estimates of those staying 1-12 months with TIM estimates (i.e. long-term migrants) excluding asylum seekers.

#### **Worker Registration Scheme (WRS)**

The WRS requires A8 citizens to register if they intend to be in employment for more than one month. WRS registrations do not apply to those A8 citizens who are self employed. The UK Border Agency<sup>8</sup> indicates that 56% of applicants intend to stay for less than 3 months. Thus short term migration estimates of 1-12 months have been combined with long term estimates to produce a more robust comparison.

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<sup>‡</sup> Some NINOs are never used suggesting there was no migration made.

<sup>§</sup> National Asylum Support System

The data coverage of each of these administrative data sources is summarised in Table B1.

**Table B1: Summary of components used in LSC estimates when compared to counts from administrative sources**

Admin source	Work related	Short term migration	Long-term International Migration				
			IPS migrants	Irish flows	Asylum seekers	Visitor switcher	Migrant switcher
<b>Flag 4s</b>	No	3-12 months	Yes	Yes	Yes	Yes	Yes
<b>NINo</b>	Yes	1-12 months	Yes	Yes	No	Yes	Yes
<b>WRS</b>	Yes, A8 only	1-12 months	Yes A8	No	No	No	No

## Annex C. Overview of Methodology for Calculating Visitor Switcher Adjustments

This annex provides an overview of the current method for estimating visitor switchers as used in the LSC estimates presented in this paper. The method presented describes the first two stages to estimating visitor switchers for A8 countries. Further detail on the adjustments, including how visitor switchers are distributed to local area levels, are available in previously published documentation.<sup>6</sup>

### Part 1: Calculating EEA/non-EEA visitor switchers estimate:

Separately by EEA and non-EEA, visitor switcher total =

$$\frac{V_t + V_{t+1} + V_{t+2}}{((LSV+LoS7)_t + (LSV+LoS7)_{t+1} + (LSV+LoS7)_{t+2}) / 3} * (LSV+LoS7)_{t+2}$$

Where,

V = Visitor Switchers identified through IPS respondents who had lived in the UK for longer than 12 months but originally only originally intended to stay for less than 12 months.

LSV = Length of Stay Visitors (intended length of stay is 6 to 12 months)

LoS7 = Intended length of stay is don't know possibly 12 months

### Part 2: Estimating the proportion of non-EEA visitor switchers from A8 countries

Calculated using total LSVs and LOS7s for each half year- not the number of visitor switchers identified on the IPS question.

- Total the number of LSVs and LOS7s over 3 year period (e.g. the sum of each half year from 2005-2007 will give the H2 2007 estimates by grouping). This is done for the EEA as a whole and subcategories within EEA i.e. British, EUA10, EUA8 etc.
- Calculate the proportion of LSVs and LOS7s for each half year for the A8 (Divide the LSV and LOS7 A8 total by the LSV and LOS7 EEA total and multiply by 100).
- Apply these fractions to the EEA visitor switcher figure calculated in part 1 for the correct half year.