



Australian Population Association

12th Biennial Conference

population and society: issues, research, policy

15-17 September 2004 - Canberra, Australia

International migration: Conceptual and measurement puzzles

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Abstract

The paper examines the conceptual and measurement processes and issues relating to international migration statistics in Australia and its comparison with international standards. The Australian Bureau of Statistics derives estimates of resident population on a quarterly basis by adding natural increase and net overseas migration (NOM). The main source of data used to calculate NOM are incoming and outgoing passenger cards collected and processed by the Department of Immigration and Multicultural and Indigenous Affairs. Each month, there are well over one million arrivals and departures at Australian borders and accuracy of NOM is vital as it currently accounts for around half of Australia's population growth.

NOM is derived as the difference between permanent and long-term (12 months or more) arrivals and departures. Two NOM figures, preliminary and revised are produced. Preliminary NOM contains primarily traveller movements data modelled by an estimate of travellers who will change their intended duration of stay. Revised NOM is produced up to 15 months after the reference quarter with an adjustment for the actual duration of stay or absence of a traveller. A number of adjustments designed to reflect differences between stated travel intentions and actual travel behaviour are applied to overseas arrivals and departures data. An unintended consequence of this is that persons arriving with a stated intention of staying for more than a year are excluded if they make short visits overseas during their overall long-term residency in Australia. There is need to further improve the methodology to adjust for all changes in intended duration of stay of arriving and departing passengers.

Paper prepared for the 12th Biennial Conference of the Australian Population Association, 15-17 September 2004, Canberra.

International Migration: Conceptual and measurement puzzles

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ABSTRACT

The measurement of international migration for the purposes of population estimates has changed over time. The concept of 'resident population' was introduced in 1981, a shift from a de facto population count to de jure count, with de jure residence defined in Australia for a period of 12 months or more. The Australian Bureau of Statistics derives estimates of resident population on a quarterly basis by adding natural increase and net overseas migration (NOM). The main source of data used to calculate NOM are incoming and outgoing passenger cards collected and processed by the Department of Immigration and Multicultural and Indigenous Affairs. Each month, there are well over one million arrivals and departures at Australian borders and accuracy of NOM is vital which accounts for around half of Australia's population growth.

Two NOM figures, preliminary and revised are produced. Preliminary NOM contains primarily traveller movements data modelled by an estimate of travellers who will change their intended duration of stay. Revised NOM is produced up to 15 months after the reference quarter with an adjustment for the actual duration of stay or absence of a traveller. NOM is basically the difference between permanent and long-term (12 months or more) arrivals and departures. However, at the time persons cross the Australian border, it is not empirically known how long they will actually spend in Australia or overseas. In order to produce NOM, a number of adjustments are applied to overseas arrivals and departures data. These mainly comprise adjustments designed to reflect differences between stated travel intentions and actual travel behaviour. An unintended consequence of this is that persons arriving with a stated intention of staying for more than a year are excluded if they make short visits overseas during their overall long-term residency in Australia and have implications. Options to further improve the methodology to adjust for all changes in intended duration of stay of arriving and departing passengers in preliminary and revised estimates have been discussed.

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1. Introduction

One of the core functions of the Australian Bureau of Statistics (ABS) as Australia's national statistical agency is to provide regular estimates of the size and structure of the Australian population. The *Census and Statistics Act 1905* requires the Australian Statistician to conduct a population census every 5 years and compile "statistics of the number of people of each State as on the last day of March, June, September and December in each year" (Section 9(2)). These quarterly statistics, known as the Estimated Resident Population (ERP) are the official measure of the Australian population and are used for a wide variety of purposes, including the distribution of Australian Government funds to states and territories, as well as determining the number of seats for each state and territory in the House of Representatives.

Australia has a long-standing formal program of immigration. In recent years, temporary migration has also become increasingly important and students, business entrants and working holiday makers are arriving for periods between three months and four years. Australian residents are also departing overseas in greater number on a long-term temporary and permanent basis. Currently, there are between 1.2 and 1.7 million arrivals and departures at Australian borders each month. The measurement of overseas migration into and out of Australia is important because of its impact on Australia's resident population size, electoral distribution, grant distribution and many other government, community and business decisions and activities.

The measurement of international migration for the purposes of population estimates has changed over time. The concept of 'resident population' was introduced in 1981, a shift from a de facto population count to a de jure count, with de jure residence defined in Australia for a period of 12 months or more. Net overseas migration (NOM) is one component of population change used to estimate the resident population. Initially NOM was based on the net between the total number of international arrivals and departures. However, with increased ease of travel in the 1970s, statistics on overseas migration became increasingly volatile. NOM is now based on net permanent and long-term (12 months or more) movements into and out of Australia.

Ideally permanent and long term immigrants should be added to the resident population in the quarter of arrival and permanent and long term emigrants removed from the resident population in the quarter of departure. However, travellers travel behaviour over time can change from initial intentions. Accordingly, an adjustment factor known as "category jumping" was introduced. Recently the ABS has found the category jumping methodology was problematic. An interim "migration adjustment" was implemented and a methodological research project commenced in search of an improved conceptual framework and measurement method.

This paper outlines the basis of the preliminary and revised adjustments in compiling recent estimates of NOM, the circumstances which require the calculation of both, their limitations and options for further improvement. This paper also examines the conceptual and measurement processes and issues relating to international migration statistics in Australia. The approaches used in other developed countries and those recommended by the United Nations are also summarised. In this context, appropriate measures have also been examined

for improvement to the NOM estimation methodology.

2. Methods Available

There is no single source of data that can reflect the growing complexity of the international population movements. A variety of data sources, including household based inquiries, border statistics, administrative registers and other administrative sources, produce different types of migration statistics, with its own strengths and limitations (United Nations, 2002). Population censuses or household surveys can yield an estimate of international migration stock at a country level, when appropriate questions are included in the census and survey questionnaire. However, the census information cannot be updated easily and also fail to capture the circulatory nature of international migration.

For an island country, having well-controlled ports of entry and departure, border statistics can be considered the most appropriate for direct measurement of international migration flows. Countries often apply different degrees of control depending upon citizenship of passengers and mode of transport. In general, greater control is exercised upon arrivals than upon departures.

In Australia, statistics on international migration flows are obtained through the compilation of information provided on incoming and outgoing passenger cards that are completed by all persons entering or leaving Australia. Incoming persons who are not citizens of Australia also provide information in their visa applications that is used for statistical purposes (Gray et al., 2003). The information is collected by the Department of Immigration and Multicultural and Indigenous Affairs (DIMIA) and aggregate statistics are published by both DIMIA and the Australian Bureau of Statistics (ABS). DIMIA publishes data according to legal categories: visa type (DIMIA, 2002), while ABS publishes data according to demographic categories: short-term, long-term, and permanent (ABS, 2003).

The short-term movement consists of people entering or leaving Australia for a period of less than 12 months. Long-term covers those who are entering or leaving Australia for a period of 12 months or more, but not permanently. The permanent category refers to immigrants who are entering Australia to live here permanently or to residents of Australia who are leaving Australia permanently.

The Australian Bureau of Statistics (ABS) derives population estimates by adding natural increase and net overseas migration to the population at the beginning of each period. This is known as the cohort component method, and is represented by the following equation:

$$P_{t+1} = P_t + B - D + \text{NOM}$$

Where:

P_t = the estimated resident population at time point t ;

P_{t+1} = the estimated resident population at time point $t+1$;

B = the number of births occurring between t and $t+1$;

D = the number of deaths occurring between t and $t+1$; and

NOM = net overseas migration occurring between t and $t+1$.

At the national level, the population balancing equation shows that an existing population estimate can be updated to give a new population estimate by adding births, taking away deaths and adding the net effect of overseas migration.

2.1 Net Overseas Migration (NOM)

The concept of NOM can be puzzling to conceptualise and challenging to measure. Public commentators frequently confuse the concept of NOM with the outcome of the Australian Government's Migration and Humanitarian programs. In simple words, NOM refers to permanent and long-term overseas arrivals minus departures. Currently a person who spends 12 months or more in Australia is added to the population while a person who spends less than 12 months in Australia is not added to the population for that reference period. Conversely, a resident of Australia who departs overseas for 12 months or more is taken out of the Australian population, whereas if they depart for less than 12 months, they are not removed from the population estimate. In its simplest form, this can be shown as:

$$\text{NOM} = \text{A} - \text{D}$$

where:

A= arrival of person not already included in Australian population; and

D= departure of a person already included in the population in the reference period.

For the purposes of calculating NOM, arrivals and departures are broken down further into:

A= permanent arrivals + long-term arrivals; and

D= permanent departures + long-term departures.

Conceptually then, NOM is the difference between permanent and long-term arrivals and permanent and long-term departures and can be shown as:

$$\text{NOM} = \text{PLTA} - \text{PLTD}$$

where:

PLTA= permanent and long-term arrivals; and

PLTD= permanent and long-term departures.

PLTA also includes the return to Australia of residents who have been overseas for 12 months or more and PLTD also includes the departure from Australia of visitors who have been resident in Australia for 12 months or more.

2.2 NOM and Migration Adjustment (MA)

In order to measure NOM there is a requirement for an extra conceptual consideration. At the time people cross the Australian border, they fill out a passenger card stating whether they are a visitor or an Australian resident. They also state an intended length of stay in Australia (for a visitor arrival) or an intended length of stay overseas (for a resident departure). This information of stated-intention is used by the ABS to calculate a preliminary population estimate. Returning Australian residents are not asked how long they intend to stay before a future departure overseas, and similarly, departing overseas visitors are not asked whether they intend to return to Australia and if so, in what timeframe

As noted earlier, travellers can change travel intentions and behaviour and their actual duration of stay or absence can be different from that first stated on arrival (visitors) or departure (residents). At the time a person crosses Australia's border, it is not empirically known how long they will spend in Australia (for an arrival) or overseas (for a departure). Actual behaviour is not known until one year after the initial border crossing, but this is often too late to meet the requirement for timely population estimates. The only data ABS has at its disposal prior to 12 months after the reference period is based on what people state they intend to do and previous history. Accordingly a migration adjustment is required to account for changes in traveller's actual behaviour compared to their stated intentions for both arrivals and departures.

Therefore the final equation for estimating NOM can be expressed as:

$$\mathbf{NOM = PLTA - PLTD + MA}$$

where:

PLTA= permanent and long-term arrivals;

PLTD= permanent and long-term departures; and

MA = Migration Adjustment (for actual duration of stay or absence).

Previously the migration adjustments were referred to as migration 'category jumping'. However, the simpler term 'migration adjustment' is now used. Due to timeliness requirements preliminary quarterly estimates of NOM are compiled 5 months after the reference period and these are revised 15 months after the end of the financial year when subsequent travel events can be taken into account.

2.3 Preliminary NOM and MA

Migration adjustments applied to passenger card based data in compiling preliminary NOM estimates are based on the trends observed for the proportions of long-term and short-term arrivals and departures who change their travel behaviour in the last year. Based on these trends, modelled adjustments are made to account for persons whose stated intentions are likely to differ from actual travel behaviour:

- Long-term visitor arrivals assumed to be staying in Australia short-term, subtract from NOM;
- Long-term resident departures assumed to be staying overseas short-term, add to NOM;
- Short-term visitor arrivals assumed to be staying in Australia long-term, add to NOM; and
- Short-term resident departures assumed to be staying overseas long-term, subtract from NOM.

Preliminary migration adjustments are only applied to the above four major movement categories. Changes in the movements of permanent arrivals and departures are not accounted for in the preliminary NOM as these are small in number.

2.4 Revised NOM and MA

From July 1998, a unique person identifier is available for each arrival/departure passenger card record where it could be matched to a passport movement within DIMIA's systems. The data item enables ABS to match consecutive international movements and derive an improved measurement for changes from intended duration to actual duration at person level rather than at an aggregate level.

Based on sequentially matched passenger records, comparing stated travel intentions with actual behaviour, adjustments are made in compiling NOM estimates for persons whose stated intentions differed from actual travel behaviour:

- Permanent arrivals who actually stayed in Australia short-term, subtract from NOM;
- Permanent departures who actually stayed overseas short-term, add to NOM;
- Long-term visitor arrivals who actually stayed in Australia short-term, subtract from NOM;
- Long-term resident departures who actually stayed overseas short-term, add to NOM;
- Short-term visitor arrivals who actually stayed in Australia long-term, add to NOM; and
- Short-term resident departures who actually stayed overseas long-term, subtract from NOM.

The NOM estimation method is now based on:

- a direct calculation of time spent by each person;
- persons rather than movements; and
- full population of movement records rather than a sample of records (for short-term travellers only).

Further detailed information on these migration adjustments, as well as a more detailed description of how the ABS calculates NOM estimates, is found in the *Technical Note - Measuring Net Overseas Migration* introduced from the September 2003 issue of *Australian Demographic Statistics* and Demographic Working Papers (ABS, 1995, 2004a, and 2004b).

3. International Standards

International migration, with its intricate web of demographic, social, economic and political determinants and consequences, is a topic that has moved to the forefront of the national and international agenda. The United Nations (UN) has been active in its efforts to improve the quality and comparability of international migration statistics. In this attempt, for integrating and improving international migration flows, the UN has so far issued three sets of successive recommendations over the years with significant revisions each time (United Nations, 1953, 1976, and 1998). Its latest 1998 recommendations on international migration statistics is in response to increasing international population movements (United Nations, 1998).

The aim in carrying out the 1998 revision of the recommendations has been to outline a process by which both the quality and the comparability of international migration statistics may be improved while at the same time ensuring that users have access to meaningful and sound information on several aspects of international migration. So as to understand the dynamics of international migration, a framework was proposed to provide a means of answering certain crucial questions such as:

- Overall annual net gain or loss of population through international migration;
- International migrants admitted annually with their country of origin;
- Migrants exercising free provision of citizen with country of origin;
- Number of citizen emigrants every year with country of destination;
- Emigrant citizens returning every year with countries to which they are returning;
- Migrant workers admitted annually and leaving the country permanently;
- Asylum seekers arrived annually and admitted on humanitarian grounds (including refugees);
- Persons admitted for family reunification over a year;
- Total number of international migrants in the country and those economically active.

The above do not have equal relevance for all countries and is also not an exhaustive list covering all significant issues relating to international migration and its measurement.

According to the latest recommendations of the United Nations on statistics of international migration (UN, 1998), an international migrant is defined as "*any person who changes his or her country of usual residence*". The concept of place of residence is used in censuses to mean the geographical place where the enumerated person usually resides. The concept of country of usual residence is also used to determine who is a visitor for the purpose of international tourism statistics. Therefore, the latest revised recommendations of the United Nations (1998) on international migration distinguish between visitors, short-term migrants, long-term migrants and permanent settlers as follows:

- *Visitors* are defined as persons who do not reside in a country of arrival and who are admitted for short stays where their movement to that country is for purposes of recreation, holiday, visits to friends and relatives, business, medical treatment or religious pilgrimage;

- *Short-term* migrants are defined as persons who move to a country other than that of their usual residence for a period of at least 3 months but less than a year (12 months) and are in paid employment in the country of destination. The country of usual residence of short-term migrants is considered to be the country of destination during the period they spend in it;
- *Long term migrants* are defined as persons who move to a country other than that of their usual residence for a period of at least a year (12 months), so that the country of destination effectively becomes their new country of usual residence; and
- *Migrants for settlement* are defined as persons granted the permission to stay for a lengthy period, who are subject to virtually no limitations regarding the exercise of an economic activity, ie. have right to employment.

Only a few countries have implemented the above UN recommended definitions strictly in reporting. The lack of uniformity among countries in defining a migrant has been a key source of inconsistency in international migration statistics. Countries gather data according to their own definitions and hardly make adjustments for international comparability. Hence, international efforts to achieve greater homogeneity in the concepts underlying flow statistics on international migration have achieved limited progress. Appendix A contains experience of a few developed countries.

The UN recommended that multilateral efforts to standardise international migration information and statistics should be strengthened in order to improve the cross national comparability. High priority should be given to facilitating governments' use of the UN recommendations, in particular, the framework proposed to integrate the information obtained from different sources should be promoted (Population Division, 2002).

Quality, completeness and timeliness are important elements of international migration data. Halting or significantly reducing the movement of undocumented migration should receive priority. The 2002 UN Report provides a wealth of information on international migration levels, trends and policies. Nevertheless, migration information remains incomplete and often inaccurate.

4. Evolution of Australian NOM

Australia has a long-standing formal program of immigration. In the last decade, temporary migration has also become increasingly important, with overseas students, temporary business entrants and working holiday makers arriving for periods of stay ranging from three months to four years. Australian residents are also departing overseas in greater numbers on a temporary long-term as well as permanent basis. The UN Report (2002) notes that migration data in Australia is of good quality which reports all important arrivals and departure statistics.

4.1 1980s Change to Net Permanent and Long Term

The way in which the ABS measures international migration for purposes of population estimates has changed over time. Importantly, there have been changes to the concept of what constitutes the 'population'. For statistics prior to 1971, the population was defined as the number of people actually present at a given time, with net overseas migration measured as the difference between total arrivals and total departures (i.e. including foreign tourists and excluding Australians abroad). With the 1981 Census of Population and Housing, however, the concept of 'resident population' was introduced; population estimates based on this new concept were subsequently constructed back to 1971. This conceptual change represents a shift from a de facto population count to a de jure count, with de jure residence defined as residence in Australia for a period of 12 months or more.

4.2 Introduction of Category Jumping (Migration Adjustment)

After the duration of their movement had been taken into account in the calculation of net migration, some travellers changed the duration of their movement from short-term to long-term or vice versa. This problem was overcome in the measurement of net migration through indirect estimates being made of the number of people who made these changes. From the stated duration of stay in Australia, the expected period of departure could be obtained. The correction for visitors could be calculated as the difference between the number of short-term visitors expected to leave in a period compared to the number that actually did leave. A similar approach was applied to residents departing short-term to obtain a correction for residents. The balance of these two corrections then provided a net correction to the annual net overseas migration estimates (where the period was one year). ABS has been making this adjustment to its estimate of NOM since 1983.

4.3 1998 Change to Duration of Stay/ Absence Measurement

Prior to July 1998, the duration of stay of departing visitors, and the duration of absence overseas for returning residents, was measured on passenger cards via direct questions to travellers. In July 1998 there was a passenger card design and system change which changed the measurement of actual duration of stay/ absence from traveller reporting to derived measurement by comparing the dates of linked border movements. Duration is now calculated by matching incoming and outgoing passenger cards. This applied for visitors actual duration of stay on departure and residents actual duration of absence on return.

Although this change resulted in a greater level of precision in measuring actual duration of stay or absence data from last border movement, an unintended consequence was that it introduced a break in the series impacting mostly on long term travellers. The change impacted significantly on the input series to the category jumping estimation methodology leading to implausible results. The break in series could be traced to long term visitors who could be expected to make short trips overseas during a longer period of stay (e.g. overseas students returning overseas for academic holidays during a 3 or 4 year stay in Australia). For a long term visitor to Australia, each punctuating short trip overseas reset the duration of stay counter to zero. Each arrival with the intention of staying in Australia for more than 12 months could be matched with a departure which measured the actual duration of stay as short term. Long term visitor arrivals continued to grow but was not matched with an equal growth in long term visitor departures. This occurred at a time when there were increases in

overseas students coming to Australia for study and increasing numbers of long term temporary business migrants.

4.4 Review

The measurement effects of category jumping were reviewed by Khoo and McDonald (2000, 2002), McDonald and Kippen (2002) and McDonald et al (2003). These reviews showed that adjusting for category jumping could make a significant difference to annual estimates of net overseas migration. However, its impact on population estimates was much smaller because category jumping has been positive in some years but negative in others. Further, the first review, Khoo and McDonald (2000) noted that it was inadvisable to estimate category jumping on a quarterly basis before full information was available that enabled the accurate calculation of appropriate correction factors. Annual category jumping calculated on the basis of data available some 15 months after the reference quarter was considered preferable. The review also found that a vast majority of new arrivals who stated that they intended to stay for exactly 12 months left before the 12 months had elapsed. Several options were discussed, yet none considered perfect in addressing the issue totally. The review concluded that a combination of options may be an appropriate approach to deal with various issues and problems with estimation of NOM including an adjustment for category jumping.

4.5 Current Method and Migration Adjustment

The method used in the past had a few limitations. Firstly, it was based on gross flows of traveller movements rather than individual travellers. Secondly, and more importantly, until June 1998 the measurement of duration of stay or absence was based on passenger reporting on the arrival or departure card. This self reported duration, which itself was subject to reporting error, was used to determine the time at which a person arrived (for visitors) or left Australia (for Australian residents). However, from July 1998 onwards, implementation of a new passenger card design and processing systems enabled DIMIA to derive actual duration of stay or absence by matching both arrival and departure cards rather than relying on passengers reporting their duration of stay or absence.

Because of a shortcoming noticed in the post-1998 input data, ABS stopped deriving category jumping estimates and revised category jumping estimates from September 1997 onwards to zero until improved estimates based on passenger movement history data were developed in late 2003. The unique person identifier enables ABS to match consecutive international movements and hence to derive an improved measurement for category jumping at person level rather than at movement level. Using this improved new method, category jumping estimates from the September quarter 2001 onwards have been derived by the ABS.

Using matched passenger records the current revised estimation method looks at the travel sequence (or movement history) of each person over a period of one year and then calculates actual duration of stay in that one-year window. A person is added to ERP if they reside in Australia for 12 months. Thus if travellers change their duration of stay, they may be added or subtracted from NOM depending on the circumstances. A visitor who changes from a long-term to a short-term duration is subtracted from NOM. A visitor who changes from a short-term to a long-term duration is added to NOM. In the case of Australian residents overseas, the opposite situation is considered. An Australian resident changing from long-term to short-term absence is added to NOM, while short-term changing to long-term absence is subtracted from NOM.

People who arrive permanently as migrant and Australian residents who depart permanently for overseas are not required to provide any intended duration on the passenger card. However, in its adjustment to derive final estimates for NOM, ABS has considered two small groups of people, which are:

- Permanent migrants who arrived and left Australia in the same quarter without any return in a one-year period are taken out, and
- Australian residents who left permanently but returned back in the same quarter without any further departure within a one-year period are added back.

The method also enables an adjustment for people who have been added to or taken out of the ERP multiple times due to frequent overseas travel.

Using the current method, ABS has applied a NOM adjustment of -23,100 for 2001-02 (Tables 1 & 2). An independent analysis conducted by McDonald et al. (2003) proposed an adjustment of -37,700 for the same period. McDonald et al. combine DIMIA stock data (based on student visas, business visas and a number of other small, temporary long-term visa types) with preliminary data on net overseas migration published by the ABS. The two estimation methods are not strictly comparable as they each use different methodologies.

The preliminary estimates of NOM are required to derive preliminary population estimates 5 to 6 months after the reference period. During preliminary estimation, not all data required for an adjusted estimate of NOM are available. Therefore, a model based approach has been considered suitable and is applied for the preliminary estimation of NOM. Analysis of six quarters of data by the ABS, beginning from March quarter 2001 to June quarter 2002, have shown a somewhat stable relationship between the number of travellers in each of the four major movement categories and the number who changed their actual duration of stay or absence during the revised NOM estimate. The proportion of travellers who had changed their duration of stated stay or absence have had small variations between quarters for each category of travel. For example, about 70% of all long-term visitors were taken out of preliminary NOM and about 50% of long-term Australian residents were added back to preliminary NOM. Under the assumption of similar patterns, these relationships were used to derive preliminary NOM estimates for each of the quarters in 2002-03. The overall preliminary estimate of the adjustment is approximately -29,000 for the 2002-03 financial year (Tables 3 & 4). As more data becomes available, the relationships used in the model are subject to revision and so are the preliminary estimates of NOM. Only the four major groups of travellers (long-term and short-term overseas visitors and Australian residents departing long-term and short-term) have been considered to derive the preliminary estimates, excluding any changes to permanent migration.

5. Discussion and Options for Improvement

Compared with data on fertility and mortality, compilation of international migration data are problematic for nearly all countries and statistics needed are very often lacking. While birth and death occur only once in an individual's life, migration may occur repeatedly, which contributes to the difficulties in measuring it. International migration data is problematic and not universally comparable, and Australia is not an exception. Although Australian data on international movements is of good quality, there is room for improvement to make it more comparable internationally and also meet Australia's statistical, program, policy and research requirements.

Treatment of people with respect to ERP by category of travel is shown in table 5. A person making a movement at any point in time must fall under one of the 10 categories (Arrivals and departures for settlers, long-term resident, long-term visitors, short-term resident, and short-term visitors). How the ABS treat different groups of people in relation to the Australian ERP at their point of entry or departure, and how they should be treated after one year from the first movement in question for category jumping estimation are shown in the table.

The process of adjusting movement data on travellers' stated intentions to reflect their actual behaviour are complex, and depend upon the amount and type of movement data available at a particular point in time. The method currently used compares data on actual travel movements over a one year period with those first advised by individual travellers. In order to conduct such a comparison, data for a 15 month period (i.e. one year plus one quarter) are required.

The current method of estimating category jumping is different from the method previously used by the ABS. A major criticism to the previous method is that with the changed and increasing number of international movements the method failed to produce reasonable estimates of category jumping. A minor criticism was that the method was based on a residual of gross movements (i.e. arrival/departure cards). A person making multiple movements was therefore likely to be counted more than once into or out of the Australian ERP. Producing category jumping estimates by relating movements to person level is a major improvement to the earlier method.

However, the current method used by the ABS to estimate NOM also has some limitations. The method removes, through its adjustment for actual duration, long-term visitors from the population who in fact are residing long-term in Australia but are making short periods of overseas travel during their overall long-term period of residency in Australia. An illustrative but not exhaustive or limiting example would be 3 or 4 year overseas students who travel back to their country of origin at least once a year. Similarly, Australians overseas may also be making visits to Australia during their overall longer stay overseas. Although there could be strong argument to retain or exclude these people in ERP, the current estimation technique does not allow this unless a change in the measurement of a 'resident' is adopted.

The ability to adjust for category jumping depends on information on intended and actual duration of stay or travel. None of the countries reviewed in Appendix A, except New Zealand, collects this information. In the United Kingdom, on the basis of International Passengers' sample survey, migrant switcher adjustments of 5% and 1% are applied to immigrants and emigrants for changing their intended stay or absence respectively. Australia is the only known country adjusting for category jumping, taking into consideration all long-term movements. It is able to make this adjustment largely because of the system it has in place to collect and process arrivals and departures data, yielding statistics on international movements that are much more detailed and complete than those in other countries. As such, very little can be learnt from the experience of other developed countries to further improve the migration adjustment methodology.

Multiple movements lead to complexity in the derivation of category jumping, particularly for long term visitor arrivals and long term resident departures. A visitor arriving to Australia with an intended duration of over 12 months may temporarily leave the country for a short period and then again be back to Australia. An earlier ABS investigation showed that such a movement pattern was more common among long-term visitors coming to Australia with student visas, many of them going back to their home country during academic holidays. Parallel to above, a long term Australian resident may leave the country with an intended duration of over 12 months but could temporarily come back for a shorter duration (e.g. summer holidays) and then leave again.

UN recommendations do not specify whether the 12 month period for distinguishing between short-term and long-term/permanent migrants is continuous. Since most developed countries other than Australia define residence based on travellers' intentions, continuity of the period of stay is probably not considered.

The current Australian application of the "twelve month rule" requires a continuous period of stay or absence of twelve months before a person is included in or excluded from the population. For example, if someone stays 364 days out of 365 days they are not considered a usual resident. This would mean that many overseas students studying in Australia are excluded from the population, while many Australians living overseas are included in the population.

Under the definition of a long-term movement defined as 12 months or more, a student visiting their home country during holidays would be classified as a category jumper. A student or person who largely spends a period of 3 or more years in Australia except for short trips overseas each year should probably be included as part of the resident population of Australia. Similarly, Australian's who largely spend several years overseas but return to Australia for brief periods should probably not be included in the resident population of Australia. One option to resolve this incongruence would be to alter the criteria of the measurement of residence to permit brief interruptions to a long term stay in Australia or overseas. However, changing the criteria too far will substantially increase the number of long-term arrivals and departures, affecting category jumping positively to a great extent. This is currently due to the number of visitors to Australia outweighing the number of Australian residents going overseas.

An option would be to retain the 12 month or more rule, but relax the "continuity" criteria. This might be operationalised by using say 12 months accumulated over a 15 month period or an 18 month period. Such a concept would provide, for example, that students who spend up to 9-10 months out of 12 months in Australia over say a 3 or 4 year period be regarded as residents of Australia. Development of this "accumulation" method will require analysis to ensure the optimal threshold. However, the implications of using a period of 15-18 months in which the 12 months residence can be accumulated will have implications for the timeliness of revised estimates.

The definition of 12 months currently used in Australia for long-term migrants is in agreement with the UN recommendation and with most of the countries reviewed in Appendix A. This is also in agreement with the UN's recommended definition of the usual residence. There is no need to revise the definition of long-term movements to include a greater proportion of overseas movements. In the proposed methodology, overseas students and other long-term visitors will be included in population estimates if they spend at least 12 months in Australia against their overall long-term stay. Similarly, Australian residents who are abroad for at least 12 months against their overall long-term absence will be excluded. In each case short overseas visits during the long residency period will be permitted and will not be a basis to exclude or include a traveller in ERP.

This measurement change may reduce the volatility in category jumping estimates by removing a significant proportion of increasingly large visa groups, such as students and business categories from being included in category jumping. It is hoped that the proposed option is likely to improve migration adjustments and NOM estimates, that are feasible from a data management perspective and conforms with the UN recommendations of 12 months residence criteria for long-term migrants. We are not recommending any change in the conceptual rule of 12 months residency, but suggesting a change in the measurement procedure. This option will also aim to minimise the gap between preliminary and revised estimates. However, the recommended option needs to be tested with actual data including a comparison between preliminary and revised estimates for a particular period. Further, we recommend that whatever method is chosen to determine migration adjustment for revised estimates, migration adjustments for preliminary estimates need to be updated as often as possible to reflect the changes in international travel patterns over time.

TABLE 1 Estimates of adjustment for actual duration by category of movement, 2001-02

Category of movement	Number of travellers	Adjustment for actual duration of stay or absence to NOM	Proportion of total travellers
	no.	no.	%
Long-term visitor arrivals	166,763	-123,779	-74.2
Short-term visitor arrivals	4,317,763	182,494	4.2
Long-term resident departures	89,772	45,837	51.1
Short-term resident departures	2,981,179	-122,400	-4.1

TABLE 2 Components of revised net overseas migration, 2001-02

Migration components	September 2001 quarter	December 2001 quarter	March 2002 quarter	June 2002 quarter	2001-02
Permanent arrivals	22,833	21,348	22,163	22,556	88,900
Permanent departures	11,632	11,222	14,449	10,938	48,241
Net permanent migration	11,201	10,126	7,714	11,618	40,659
Long-term arrivals	65,926	59,021	91,783	47,741	264,471
Long-term departures	41,477	41,695	48,909	39,365	171,446
Net long-term movements	24,449	17,326	42,874	8,376	93,025
Published NOM	35,650	27,452	50,588	19,994	133,684
NOM adjustment	-7,938	3,737	-14,233	-4,694	-23,128
Revised NOM	27,712	31,189	36,355	15,300	110,556
% change between revised and published(a) NOM	-22.3	13.6	-28.1	-22.5	-17.3

TABLE 3 Preliminary estimates of net overseas migration, 2002-03

Category of movement	Estimate of adjustment for actual duration no.	Gross traveller movement no.	Proportion of gross movements %
Long-term visitor arrival	-128,942	184,095	70.0
Short-term visitor arrival	177,595	4,655,803	3.8
Long-term resident departure	42,664	86,211	49.5
Short-term resident departure	-120,247	3,293,337	3.7

TABLE 4 Percent of travellers who changed from stated duration of stay or absence, by category of movement and quarter

	Category of movement			
	Long-term visitor arrival(%)	Short-term visitor arrival(%)	Long-term resident departure(%)	Short-term resident departure(%)
March quarter 2001	67.3	5.1	51.8	4.2
June quarter 2001	67.0	4.4	49.2	3.7
September quarter 2001	70.6	4.1	49.2	3.7
December quarter 2001	69.3	3.6	47.8	3.7
March quarter 2002	71.3	4.1	52.3	4.1
June quarter 2002	69.0	3.5	48.7	3.2
Average (4 most recent quarters)	70.0	3.8	49.5	3.7

Table 5: Treatment of people with respect to ERP by category of travel

Category of Travel	Treatment at point of Entry/Departure	Follow-up treatment after 12 months	Additional checks/workload
Arrivals	Treatment at Entry		
Settler arrival	Added to ERP	No action is required under previous method; however, checks are needed for a new estimation method	
Long-term residents returning	Added back to ERP	No action is required	
Long-term visitors arriving	Added to ERP (on the basis of 'intended duration of stay' for 1 year or more)	Should be subtracted from reference month ERP if actual duration of stay was <1 year	Needs to check for multiple moves: (i) prior to arrival (ii) after arrival
Short-term residents returning	No addition to ERP is required	No action is required	
Short term visitors arriving	No addition to ERP is required (on the basis of 'intended duration of stay' < 1 year)	Should be added to reference month ERP if actual duration of stay was ≥1 year	Needs to check for multiple moves: (i) prior to arrival (ii) after arrival
Departures	Treatment at Departure		
Settlers/Residents departing permanently	Subtracted from ERP	No action is required under previous method; however, checks are needed for a new estimation method	
Long-term residents departing	Subtracted from ERP (on the basis of 'intended duration of stay' for 1 year or more)	Should be added back to reference month ERP if actual duration of stay was <1 year	Needs to check for multiple moves: (i) prior to departure (ii) after departure
Long-term visitors departing	Subtracted from ERP	No action is required	
Short term residents departing	No subtraction from ERP is required (on the basis of 'intended duration of stay' for <1 year)	Should be subtracted from reference month ERP if actual duration of stay was ≥1 year	Needs to check for multiple moves: (i) prior to departure (ii) after departure
Short-term visitors departing	No subtraction from ERP is required	No action is required	

Developed Region/ Country Experiences

With the continuing below replacement fertility level and low natural increase, immigration has become the major factor of population growth in many developed countries. It is likely to continue playing a significant role in population growth, distribution, and composition in these countries. Therefore, greater attention needs to be paid to the coverage and quality of migration data being collected, compiled and used for different purposes.

The joint United Nations Economic Commission For Europe - European Statisticians (UNECE-Eurostat) Work Session on Migration Statistics was held in Geneva from 21 to 23 May 2001. The session discussed implementation of UN Recommendations as well as methods investigating inflows and outflows highlighting definitions, different data sources used, and checks made on coverage and reliability of international migration (United Nations, 2001d). The measurement and monitoring of international migration flow was viewed as a growing challenge and data on emigration was considered the most difficult element to obtain. Knowledge of the demographic, economic and social consequences of migration was identified as an important motive for making the statistics more reliable and comparable.

At the UNECE-Eurostat Session, it was emphasised that dealing with differences between migrants' intended and actual length of stay represents a major challenge. Analysis of these differences in different countries confirmed that immigrants who originally declared on the border cards their intention often later change their plans and stay either longer or shorter periods of time.

Eight countries (Belgium, Canada, Israel, Italy, Norway, Romania, Slovenia and United Kingdom) participated in a task force set up to evaluate the possibilities for implementation of the new set of the United Nations recommendations on statistics of international migration. The basic table completed by each country using various sources of data revealed that there is no cell or corresponding statistical collection for which all eight countries can provide data (United Nations, 2001e). It emerged:

- The great difficulty of distinguishing between the short term and long term;
- The lack of comparability between the duration of presence or absence calculated and the intended duration given; and
- The level of completeness and reliability varies greatly according to the sources used.

The UNECE-Eurostat Session recognised the need to improve methods for the collection of statistics so as to align them more closely with the UN recommendations. Definition and measurement procedures for international migration used by a few developed countries are also briefly presented here.

Canada: Statistics Canada does not use a 12-month criterion to distinguish between permanent/ long-term and short-term migrants. Its estimates of international migration and resident population are based on a formal/ legal status (permanent or temporary) of Canadians abroad and foreigners in Canada. Estimates of immigration are based on

immigrant arrival files provided by Citizenship and Immigration Canada. Estimates of emigration are derived from the administrative files of the US Immigration and Naturalisation Service (to estimate emigration to US, the main destination of emigrants from Canada), supplemented by an indirect measurement of the number of adult emigrants to a country other than the US. There is no category jumping adjustment for the changes in status. Changes in status are presumably captured in administrative files on which estimates of different components are based (United Nations, 2001b).

New Zealand: The classification of each passenger is primarily determined by the passenger's response, on the arrival or departure card, to the question on intended or actual length of stay/ absence. If the person's intention changes later during the trip, then he or she may also change migrant category. Following ABS methodology, Statistics New Zealand (SNZ) monitors category jumping as it occurs, but does not adjust for it in published migration statistics. SNZ also does not distinguish between permanent and long-term movements. Its migration statistics refer to only two categories: (1) permanent and long-term movements and (2) short-term movements.

Sweden: According to the National Registration Law, to be registered as an immigrant or an emigrant the intention to stay in Sweden or settle abroad must be at least for one year. However, there is no adjustment for category jumping (United Nations, 2001a).

The Netherlands: The criterion for registration on the population register as an immigrant in the Netherlands is a four month duration. However, an emigrant is de-registered when he or she leaves the Netherlands with the intention to stay abroad for at least 8 months in the forthcoming twelve months. A distinction between long-term and short-term migrants could eventually be made on the basis of actual duration of stay. However, such data are usually not available to make an adjustment (United Nations, 2001c).

United Kingdom: The definition of a migrant used in the United Kingdom is based on residence or travel duration of 12 months or more. A migrant to the United Kingdom is 'a person who has resided abroad for a year or more, and who states on arrival the intention to stay in the United Kingdom for a year or more'. The definition of a migrant from the United Kingdom is 'a person who has resided in the United Kingdom for a year or more, and who states on departure the intention to reside abroad for a year or more'. Adjustment for category jumping is not carried out as in Australia. However, the migrant switcher adjustment allows for those people who state in the International Passenger Survey (IPS) that they intend to stay in the UK or abroad for more than a year but subsequently stay for less than a year (i.e. those who switch from migrant to non-migrant status). It is assumed that 5% of those identified by the IPS as in-migrants actually stay in the UK for less than a year. For emigrants, it is 1% of those identified as out-migrants return to the UK within a year. Net international migration is simply the sum of the net movements estimated from various data sources (National Statistics, 2004).

United States of America: Net international migration composes of five types of movements: legal immigration, refugee immigration, undocumented net immigration, Puerto Rican immigration, and emigration of legal residents. The components of net international migration are based on various administrative sources and analytic estimates. Data on legal immigrants are provided by the Immigration and Naturalisation Service, while data on persons admitted to the United States as refugees come from the Office of Refugee Settlement. Puerto Rican immigration and emigration estimates come from Immigration and Naturalisation Service data and independent research conducted by the Census Bureau's International Program Centre. Two components for which reliably accurate and current data are unavailable are undocumented immigration and permanent emigration of legal residents. The US Census Bureau makes an allowance of 225,000 net migration per year for undocumented immigration, while the emigration of legal residents is estimated from research on foreign-born and native-born emigration. The net effect of temporary movements of US citizens and students is assumed to be zero.

The review suggests that the level of implementation of the UN recommendations in regard to definition and measurement procedure varies greatly from one country to another. Co-operation between statistical offices of various countries and their sharing of information can significantly contribute to the improvement of methodology and statistics of international migration so as to align them more closely with the UN recommendations.

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