ANALYSING TRAVELLER MOVEMENT PATTERNS: STATED INTENTIONS AND SUBSEQUENT BEHAVIOUR

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The Department of Immigration, Multicultural and Indigenous Affairs (DIMIA) now has the capacity to track those leaving and entering Australia across successive movements. An examination of residents leaving Australia in 1998 to 1999 who indicated that their departure was permanent shows that by 30 June 2003, 24 per cent had not left permanently.

INTRODUCTION

Every time a person enters or leaves Australia, they are required to complete a passenger card.

The cards serve a number of purposes:

- They are a means by which customs, health and character declarations are collected from arrivals to Australia; and
- They provide valuable information on the travel intentions of people entering or leaving Australia.

Once collected, passenger card information is matched with visa grant data gathered by DIMIA's Travel and Immigration Processing System (TRIPS). The resulting Overseas Arrivals and Departures (OAD) data set is then sent to the Australian Bureau of Statistics (ABS), which uses it to calculate the contribution of net overseas migration (NOM) to Australia's population.

In more recent years, there have been two major changes in the content and processing of OAD data:

- The introduction of an automated processing system for passenger cards; and
- The inclusion of a personal identifier (PID) on nearly all movement records.

The inclusion of the PID offers the analyst the ability to follow all travel movements for the vast majority of individuals travelling to or from Australia since July 1998. It may be noted that the ABS is using this ability in its revised method of estimating NOM. This approach is described in more detail in *ABS Demography Working Paper 2003/5 Net Overseas Migration: Adjusting for Actual Duration of Stay or Absence*, which is available on the ABS web site.

The ability to follow movements in fine detail is also becoming an important analytical tool for DIMIA. The remainder of this paper provides an example of how it has been used to analyse emigration and return migration.

SETTING THE SCENE

Emigration from Australia, especially emigration of younger skilled Australians, has been a topic of debate. Part of the debate has been around the size of the loss of skills to the Australian community from persons leaving permanently, as against the gain in skills from persons gaining experience and qualifications overseas and then returning.

Accurate information on emigration and return rates of Australians is clearly important to this debate.

Until now, official information on emigration was based on self stated intentions on time to be spent outside Australia. This information was collected from passenger cards completed by people leaving Australia.

Such self-reported data has limitations. People can change their minds. Also,

people may misinterpret instructions and put incorrect information on passenger cards.

Return migration rates were derived from models that used counts of Australians returning from overseas and information on the length of time spent away. However, because these models were based only on aggregate numbers, they were not a precise measure.

The example that follows uses a method based on individual records to calculate return migration rates for people who indicated on their passenger card that they had left Australia permanently.

METHOD

On the outgoing passenger card, residents intending to leave Australia permanently are asked to select box F (refer Figure 1).

For the period 1998 to 1999 all passenger card records that were successfully matched against TRIPS and where box F was chosen were selected. These passenger card records were then matched against all subsequent movements for the same personal identifier (PID) to June 2003.

Where a movement was missing in sequence, for example if there were two departure records for a given PID without an intervening arrival record, an arrival was imputed half way between these departures.

ISSUES WITH PID

PID is not available on all records, as not all passenger card records successfully match against TRIPS. Match rates were around 93 per cent in 1998 to 1999 and 1999 to 2000. For data since July 2001 match rates have been much higher — initially in excess of 98 per cent and over 99 per cent in most recent data.

The DIMIA PID is subject to all the problems theoretically unique personal identifiers have in all large data systems. Multiple PIDs do occur for a single individual. Also, cases where different individuals have the same PID are far less likely, but cannot be ruled out. The extent of these problems is unmeasured, but may be assumed to be small.

PROCESSING ISSUES

The major difficulty in analysis is the sheer size of the data. There are over 16
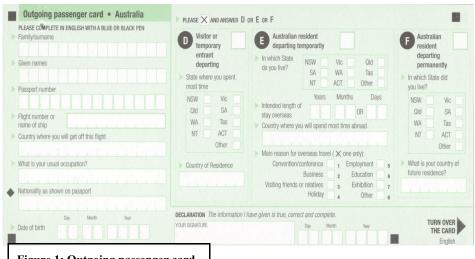

Figure 1: Outgoing passenger card

million movement records for each year of Overseas and Arrival data. While it would be preferable to process data of this size on a mainframe, resource allocation rules for the DIMIA mainframe meant it was more practicable for processing to be done on a Pentium PC. Memory constraints meant that sorting and matching programs took several days for each analysis group.

The establishment of pre-sorted master files and use of a later model PC with more hard disk space has substantially reduced processing time — from days, to hours.

ANALYTICAL ISSUES

Once a set of selected records is mapped, so that all subsequent movements for that group are tracked, there remains the issue of how to interpret the results.

In particular, the reference period for the data examined was from a given date — 1 July 1998 — to a given date — 30 June 2003. It is entirely possible that a given person in the selected data had already indicated a permanent departure (that is, had marked box F) some time before 1 July 1998. Also, there is no indication of travel made after 30 June 2003.

CLASSIFYING MOVEMENTS

Over time, it might be assumed that people who selected box F have either left Australia permanently or have ended up returning to Australia permanently.

Analysis of the passenger card records of these people shows that their movements are not so straightforward. In this study, their movement records have been grouped into one of four categories, based on examining the time from the initial Box F departure to the last available day within the analysed data time frame. These are listed below.

Not Gone

Assumed NOT permanently departed. This can be either a permanent return after an intended permanent departure OR a permanent departure incorrectly indicated (for example, filling in box F) when the intention was temporary departure:

This category includes movement records that meet the following criteria:
- The maximum number of days spent continuously outside Australia is 180 days or less; or
- As at 30 June 2003, the person is in Australia and had spent at least the last 365 days continuously in Australia.

Gone

Assumed permanently departed. Some short return visits possible.

This category includes movement records that meet the following criteria:
- A single departure record with no subsequent arrival record ; or
- Maximum number of days spent continuously in Australia is 90 days or less.

Long Exit

Assumed probable permanent departure.

This category includes movement records where the person has spent at least 365 days continuously outside Australia (and is not one of the above 'Not Gone' or 'Gone' cases). Such as persons who could be in Australia as of June 30 2003 or outside Australia at that date.

Other

Other miscellaneous movement patterns.

As discussed earlier, under Analytical Issues, there are problems when the last recorded movement is close to the end of the data time frame. The time between the last reported movement and the end of the data was treated as a completed trip.

Table 1: Movements of people who indicated they were leaving Australia permanently in 1998 to 1999, per cent

Category	All moves to 30 June 2003
Not Gone	24
Gone	59
Long Exit	11
Other	6
Total	100

Results

Table 1 reports these results against the above categories.

The 'All moves to 30 June 2003' column indicates the results of analysing movement patterns for each person from their first indicated 'permanent departure' in 1998 to 1999 to the end of the available data (30 June 2003).

As can be seen around a quarter of those people who select box F on the departure card do in fact return permanently to Australia.

Further analysis, using the data for all moves to 30 June 2003, indicates that it is the 15-24 year age group that is most likely to permanently return (29 per cent) and the 65 and over age group that is the least likely to permanently return (21 per cent).

Permanent return rates for the Australian born are very similar to total pattern. Of other countries, those born in the USA (11 per cent), New Zealand (15 per cent) and United Kingdom (18 per cent) have the lowest permanent return rates. People born in the People's Republic of China (56 per cent), Taiwan (36 per cent) and Indonesia (31 per cent) have the highest permanent return rates.

Permanent return rates by occupation groupings varied from 18 per cent for professionals to 28 per cent for non-working children. For the skilled groups, permanent return rates were: Managers and Administrators 23 per cent; Professionals 18 per cent; Associate Professionals 23 per cent and Tradespersons and Related Workers 27 per cent.

It should be noted that the permanent return rates are for a period spanning up to five years and are naturally expected to be higher over a longer period.

Additional work, looking at a cohort of people who ticked box F during 1999 to 2000, indicated permanent departures and subsequent movement over a period up to four years. This showed no noticeable differences in patterns to the earlier 1998 to 1999 cohort.

FURTHER WORK

Other work has looked at subsequent movement for Settler Arrivals. DIMIA is currently examining movement patterns for long-term temporary visitors (stated intention of stay of one year or more) and long-term resident departures.

Other possibilities for analysis include:
- Total number of days in Australia or out of Australia;
- Period of travel, for example, longest period of time outside Australia for a single episode of travel;
- Timing of travel since initial movement; and
- Various combinations of the above.