Return and Onward Migration, Attachment and Travel of New Zealand Migrants to Australia

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ABSTRACT

This article is concerned with the international mobility of New Zealanders who migrate to Australia. We study New Zealand migrants arriving in Australia between 1 August 1999 and 31 July 2002. We track all subsequent moves of these migrants out of and back into Australia, up to July 2005. Using hazard models, we find that the removal of labour market-related social security eligibility by Australia for New Zealand migrants increased the probability of remigration from Australia among those who had intended to settle permanently. Competing risk models suggested no difference between the impacts of the policy changes on onward or return moves. Settlers arriving after the policy changes were more likely to migrate again, to have lower attachment to Australia, and to make more trips away.

ABSTRAK

Artikel ini menumpukan kepada mobiliti antarabangsa bagi rakyat New Zealand yang berhijrah ke Australia. Tumpuan adalah kepada migrant dari New Zealand yang tiba di Australia antara 1 August 1999 hingga 31 Julai 2002. Kita merekodkan semua pergerakan migrant ini keluar dan masuk semula ke Australia sehingga Julai 2005. Dengan menggunakan model Hazard, hasil kajian ini menunjukkan bahawa penghapusan kelayakan jaminan sosial dalam pasaran buruh oleh kerajaan Australia kepada migran New Zealand meningkatkan kemungkinan mereka berhijrah balik dari Australia terutamanya di kalangan mereka yang ingin tinggal kekal. Model risiko bersaingan pula mencadangkan tiada perbezaan antara kesan perubahan dasar ke atas pergerakan ke hadapan dan balik. Mereka yang tiba selepas perubahan dasar ini, mempunyai ikatan yang lebih longgar dengan Australia dan meningkatkan perjalanan ke tempat-tempat lain.

INTRODUCTION

The total number of international migrants in the world more than doubled since 1960 to almost 191 million in 2005, including 13.5 million refugees (United Nations 2006). For many of these migrants there were, or continue to be, significant administrative barriers to settlement in the host country, as governments try to control inward migration in order to avoid a potential avalanche of workers from low income countries. Sometimes, however, international movement is not subject to restrictions. A particularly good example, the focus of this paper, is the migration of citizens of Australia and New Zealand between their respective countries. Under the Trans-Tasman Travel Agreement (TTTA – referring to the Tasman Sea, which lies between the two countries), officially introduced in 1973 but effectively in force since the 1920s, citizens of Australia and New Zealand may freely live and work in each other's country.

The TTTA is effectively an open entry immigration policy. Until 2000 New Zealanders in Australia and Australians in New Zealand had the same rights as other non-citizen permanent residents. This changed in 2001, when unilateral policies were introduced by Australia that removed some of the rights of New Zealanders migrating across the Tasman subsequently. Specifically, New Zealanders could no longer obtain Australian citizenship, nor were they eligible for social security while unemployed, unless they successfully applied for permanent residence, under the same immigration criteria in place for immigrants from other countries.

In this paper, we estimate the effect of these policy changes on the international mobility behaviour of New Zealanders by means of a unique longitudinal dataset provided by the Australian Department of Immigration, Multicultural and Indigenous Affairs (DIMIA) that spans a period of both the old and the new policy regimes. The dataset contains all New Zealand citizens arriving for a stay of 12 months or longer between 1 August 1999 and 31 July 2002. We track all subsequent moves of these migrants out of and back into Australia, up to 30 June 2005.The United Kingdom migrants to Australia, who were not affected by the policy changes, provide a 'control group'.

We find that the policy changes increased the probability of departure from Australia among those who had intended to settle permanently. However, competing risk models suggested no difference between the impacts of the policy changes on onward or return moves. Migrants

arriving after the policy changes have a higher absence rate from Australia, and make more trips away.

The paper makes a number of contributions to the literature. Firstly, while there are already various macro-level econometric studies of trans-Tasman migration (Brosnan and Poot 1987b, Poot 1993a, 1993b; Poot 1995; Gorbey, James & Poot, 1999), this is the first study that adopts a longitudinal micro perspective. Secondly, the paper introduces a multi-dimensional approach to international mobility consisting of migration, attachment and travel. Thirdly, the three dimensions of mobility are integrated into one dynamic behavioural theory that defines optimal joint paths of locational choice, attachment and travel. Fourthly, we find that the hypotheses derived from the theoretical framework with respect to the impact of the policy changes are generally confirmed with the longitudinal data.

TRANS-TASMAN MIGRATION

Migration between Australia and New Zealand has a long history, going back to the 19th century colonial days. Detailed reviews of the demographic trends and their contexts can be found in Pool (1980) and Carmichael (1993). Historically, the net flow tended to be towards New Zealand and although New Zealand did not join the Australian Federation in 1901, significant historical, political, cultural and economic similarities were instrumental in the introduction of free movement of citizens between the two since the 1920s. In 1901 there were 25,788 New Zealand-born migrants in Australia and 26,991 Australia-born migrants in New Zealand.

Until the Depression the Australians in New Zealand continued to exceed the New Zealanders in Australia. By 1933 the balance had reversed but even in 1976, when there were 89,791 New Zealand-born in Australia, the number of Australia-born in New Zealand was still two-thirds of that (Brosnan and Poot, 1987a). Since then the flows of migrants between the two countries have grown rapidly, and fluctuated widely, but net migration has been persistently in the direction of Australia.

The reasons are complex and varied, but lower long-run economic growth in New Zealand vis-à-vis Australia, compounded by the consequences of radical economic reforms between the mid-1980s and mid-1990s in New Zealand (with more moderate reforms in Australia), played a major role. The declining real cost of air travel and large post-war baby boom cohorts seeking overseas experience were also major

factors. 'Ripple' effects of return migration, following initial migration waves contributed to the volatility in the flows (e.g, Poot (1993b) and Gorbey, James & Poot (1999)). Figure 1 display annual Permanent and Long-Term Trans-Tasman migration flows 1948-2005.

It is clear from Figure 1 that since the mid-1970s migration from New Zealand to Australia is at higher levels and significantly more volatile than migration from Australia to New Zealand. Since trans-Tasman migration accounts for more than half of New Zealand's overall international migration, trans-Tasman migration has had a major impact on the growth rate of the New Zealand population (e.g., Poot 1993a).
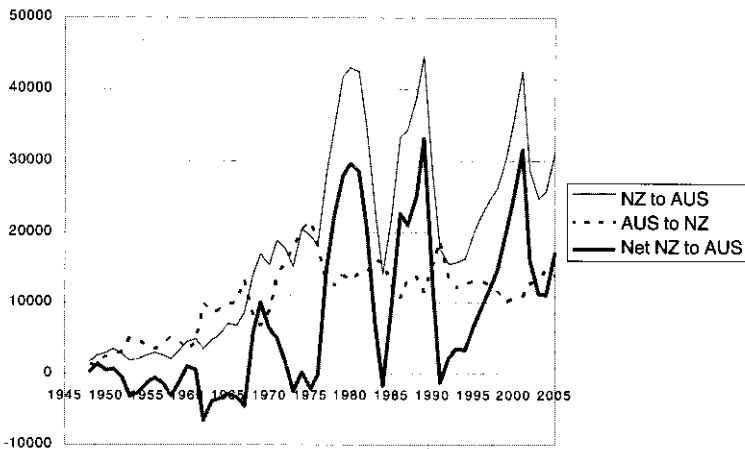

FIGURE 1. Trans-Tasman permanent and long-term migration flows, year ending 31 March, 1948-2005

At the time of the 2001 Census, the New Zealand-born population in Australia was 355,765 and is expected to have increased by another 100,000 by the time of the June 2006 Census. The Australia-born population in New Zealand was 56,259 persons in 2001 and is expected to have remained relatively stable since then. Given that the flows are not subject to administrative controls, the net migration from New Zealand to Australia may be interpreted as intra-country regional labour market adjustment in response to significant growth differentials (Poot, 1995), with New Zealand only a middling performer compared with fast growing Australian States such as New South Wales, Queensland and Western Australia (Grimes 2005).

The imbalance in the flows led the Australian government in the late 1990s to revisit the TTTA, as Australia perceived the situation to be one of a very unequal fiscal burden associated with the New Zealanders in Australia as compared with their counterparts in New Zealand. New Zealand made no financial contribution to labour market-linked welfare payments to New Zealand citizens in Australia, while New Zealand contributions to state pensions paid to their citizens in Australia were considered to be far too little.

Another Australian reason for concern with the unbalanced migration flows was that a growing proportion of the flow from New Zealand to Australia in the 1990s consisted of immigrants to New Zealand, who moved on to Australia after obtaining New Zealand citizenship. This form of 'backdoor entry' into Australia was perceived by the Australian Government as diminishing its ability to control settler entry into that country.

Pressures to terminate the TTTA were successfully resisted, as doing so would have been inconsistent with a trend towards greater economic integration between the two countries, formalised under the 1983 Closer Economic Relations (CER) agreement and subsequent liberalisation of trade and capital mobility (see e.g. Grimes, Holmes & Bowden 2000). However, on February 26 2001, a policy change was announced that aimed to overcome the problems noted above. From June 2001, New Zealand citizens migrating to Australia were no longer eligible for labour market-related social welfare payments (primarily the unemployment benefit) regardless of the length of time they had been living in Australia. Instead, New Zealand citizens must now successfully apply for permanent residence in Australia, subject to the same conditions as migrants from other source countries, in order to be eligible for such social welfare payments.

Alongside access to social welfare benefits, New Zealanders also lost their eligibility to apply for Australian citizenship and to sponsor family members to join them in Australia, without having first gained permanent residence. These changes brought New Zealanders' access to social support and the privileges of citizenship more in line with migrants from other source countries, while retaining their right to live and work freely in Australia as agreed under the TTTA. New Zealanders also retain access to non-labour market based benefits, including a range of family allowances and tax credits, rent assistance, and Medicare, as well as public housing and education services. In effect, the policy changes remove the safety net of social welfare in the case of loss of labour income, while

maintaining access to social services. Migration statistics suggest that the policy changes led to smaller post-announcement flows, at least initially, while the proportion of 'backdoor' migrants among the NZ citizens dropped as well (Bedford, Ho & Hugo 2003).

In this paper we measure the impact of the policy changes by observing differences in the international mobility behaviour between New Zealanders arriving before the policy changes were announced, as compared with those who arrived subsequently. As noted in the introduction, to control for other factors that may impact on mobility behaviour over time we use a sample of United Kingdom citizens who migrated to Australia at the same time as a 'control group'.

The econometric analysis is applied to a unique dataset of 112,454 New Zealand citizens and 108,734 UK citizens who stated an intention of remaining in Australia for at least 12 months upon first entry between 1 August 1999 and 31 July 2002. Their subsequent movements out of, and back into, Australia have been recorded until 30 June 2005. As noted in the introduction, we consider three dimension of international mobility: the likelihood of remigration, the percentage of time actually spent in the host country, and the frequency of travel. Before describing the data in Section 4, we first provide a theoretical framework that combines these dimensions of international mobility in the next section.

AN ECONOMIC THEORY OF MIGRATION, ATTACHMENT AND TRAVEL

One issue that is remarkably neglected in the international migration literature, yet is of growing importance given the growth in international travel, is the pattern of international mobility that follows an initial decision to migrate. With longitudinal data at our disposal on the mobility of New Zealand and UK migrants to Australia, the subsequent international mobility of these migrants following their arrival in Australia is central to our analysis. This mobility includes both short-term movement and long-term migration, for example back to the home country, onward to a third country, or involving several additional long spells in the host country interspersed with long spells at home.

Traditionally, the move to a foreign land was seen as a once in a lifetime decision, but increasingly migrants continue to nurture links with the home country, or develop links with third countries, not just to maintain personal or business contacts, but also as a rational strategy to prepare for

return or onward migration. The incidence and determinants of return and repeat migration have already been addressed quite extensively in the internal migration literature (e.g., DaVanzo 1983; Kau & Sirmans 1972), but have in recent years also attracted growing attention in the international migration literature (Constant & Zimmermann 2003; Dustmann 2003; Bijwaard 2005); However, what is often neglected in this literature is the importance of the linkages between short-term and long-term movement.

Potential international migrants have several choices to make. They choose a path of locations that may involve one or several spells of work abroad (referred to as migration in what follows), but while abroad they must decide on the amount of time they wish to actually be in the host country (referred to as attachment) and the frequency of trips back home or elsewhere (referred to as travel).

The innovation of the proposed theory is that the three phenomena of migration, attachment and travel are considered interlinked. For example, when the cost of international travel is high or visas are hard to obtain, the incentive to migrate may be low but once migration has taken place the optimal attachment to the host country will be relatively high and international mobility relatively low. Consequently, a lowering of the effective cost of international movement (e.g. by greater flight frequencies or lower airfares) may lead to a greater desire to migrate, but may also lower attachment and increase mobility. The remainder of this section formalises these ideas by means of an integrated dynamic cost-benefit model of migration, attachment and travel. In line with an emphasis on economic considerations, the focus is here solely on the migration of people for work-related reasons.

To simplify matters, but without loss of the essence of the international residential mobility process, consider two countries: home H and abroad A. Migration is defined, as is common in actual migration statistics, by intended or actual residential relocation for a period of twelve months or more. Consequently, the unit of time is a year. Workers may move between countries within the year, but such short-term mobility does not affect their residence status, which – as is conventional in tax laws – is defined by the country from which they obtain a wage. During a given initial year, $t = 0$, a worker decides a sequence of residences (home H or abroad A) for years $t = 1, 2, ..., N$, with N the expected remaining years of work until retirement. All variables in year $t = 1, 2, ..., N$ are interpreted as expected values, given the information available in year 0.

The sequence of residences is a vector $\mathbf{l} = (l_0, l_1, l_2, \ldots, l_N)$, with $l_t = 0$ if the worker is employed in H and $l_t = 1$ if the worker is employed in A; $t = 1, 2, \ldots, N$. By assumption $l_0 = 0$.

In each year t, workers gain utility from consumption activities C_t; from amenities available at a given location (e.g. climate, public facilities) Q_t; and from the strength of ties with family and friends P_t. The latter are initially assumed to be mostly, but not entirely, located in H. By spending time in A, the worker accumulates additional utility-yielding personal relationships there as well.

However, in line with the growing prevalence of trans-national location observed in many countries, the worker has additionally a choice to decide what proportion of the year to allocate to actually being in A, while being in H for the remainder of the year. As noted earlier we refer to this as attachment. This is here defined with respect to A, so that attachment a_t is the proportion of the year t that the worker actually spends in A. Wage income is only obtained when the worker is actually in their country of residence, so time spent in H would be costly for a worker who decides to work in A and vice versa. By assumption $a_0 = 0$.

Having decided what proportion of time to allocate to H and A, the third and final decision which the worker must make is that of the frequency of trips between the two countries, referred to above as travel. The variable m_t measures the number of return trips between H and A, following the initial decision of where to work in year t. If $a_t = 0$ or $a_t = 1$, then $m_t = 0$. But as long as $a_t \hat{1} (0,1)$, $m_t = 1, 2, 3, \ldots$ In that case, given a_t and m_t, the average duration of a spell in H is the fraction $(1-a_t)/m_t$ of a year while spells in A are of duration a_t/m_t. By assumption $m_0 = 0$.

Individuals are assumed to experience diminishing marginal utility not just with respect to consumption goods but also with respect to the amount of time spent in a given country. Further, it is assumed that a migrant living in country A gains greater utility from a number of short sojourns to H than from one extended trip, and similarly for migrants living mainly in country H and visiting A.

The worker now chooses three vectors l, a and m to maximise the present value of utility

$$V = \sum_{t=1}^{N} \frac{U\left(C_t, Q_t, P_t\right)}{\left(1+\rho\right)^t} \tag{1}$$

in which U refers to the utility function, r refers to the person's internal rate of time preference, C_t is the real value of the worker's consumption

measured in H's currency, Q_t is an index of the stock of amenities enjoyed globally and P_t is an index of the global stock of personal relationships. The utility function is assumed to have the usual properties and for simplicity takes the form:

$$U(C_t, Q_t, P_t) = C_t^{\alpha_1} Q_t^{\alpha_2} P_t^{\alpha_3} \tag{2}$$

By spending time in A and H respectively, the volume of amenities enjoyed in year t is simply the combination of $a_t Q_t^A$ and $(1-a_t)Q_t^H$ whereby Q_t^A and Q_t^H are the exogenous levels of amenities in A and H at time t respectively. Enjoyment of the amenities is also a function of the number of times they are experienced per year, i.e.

$$Q_t = m_t^{\beta_1} \left[a_t Q_t^A \right]^{\beta_2} \left[(1-a_t) Q_t^H \right]^{\beta_3} \tag{3}$$

The strength of ties with family and friends in year t is a function of the stocks of relationships built up in both H and A and the number of visits made to nurture these relationships. It is assumed that stocks of relationships in a location build up linearly with the amount of time spent in that location. The number of new friends and acquaintances made per year is p^H in H, and p^A in A. Hence

$$P_t^H = P_0^H + \pi^H \sum_{j=1}^{t} \left(1 - a_{j-1}\right) \tag{4}$$

$$P_t^A = P_0^A + \pi^A \sum_{j=1}^{t} a_{j-1} \tag{5}$$

with P_0^H and P_0^A the initial stock of relationships in H and A respectively. This takes into account that the ease with which relationships build up can differ between H and A, as p^A and p^H need not be the same. If in year t the worker has not yet been in A (and recall $a_0 = 0$), then obviously $P_t^A = P_0^A$. The 'volume' of benefits from the global network of relationships is, similarly to amenities, a function of the combination of $a_t P_t^A$ and $(1-a_t)P_t^H$ whereby P_t^A and P_t^H are now the endogenous stocks of relationships in A and H in year t respectively. As noted above, the volume of personal interaction is also positively related to the number of trips between the countries. Hence,

$$P_t = m_t^{\beta_1} \left[a_t P_t^A \right]^{\beta_2} \left[(1-a_t) P_t^H \right]^{\beta_3} \tag{6}$$

Consumption equals income minus savings minus the cost of migration whenever it occurs, and minus the cost of trips between the two countries, i.e.

$$C_t = l_t \varphi_t Y_t^A + (1-l_t) Y_t^H - S_t - D_t |l_t - l_{t-1}| - 2m_t \tau_t \tag{7}$$

in which φ_t is the purchasing power parity exchange rate that converts foreign nominal income into comparable home consumption, Y_t^A and Y_t^H are income obtainable in A and H respectively, S_t is financial saving, D_t is the cost of job migration from H to A or back (which only occurs when $l_t \neq l_{t-1}$) and τ_t is the unit cost of a one-way trip between H and A. Consumption is spread evenly over the year, irrespective of location. The cost of migration D_t would include the transportation cost of the worker and family members, the removal of household belongings, job separation costs, etc.

The worker possesses human capital from a given level of education (including initial experience) E_0 that yields, through work, a rate of return δ_t^H or δ_t^A. In addition, working in either H or A yields additional experience in these countries that is rewarded in that country but not in the other (i.e. on the job training is country-specific). The return to experience is proportional to the time worked, with ε_t^H and ε_t^A being the rates of return.

Both in H and A, income depends on the availability of work. The unemployment rate of home and abroad are given by u_t^H and u_t^A respectively. When a person is unemployment, the government pays a social security benefit of B_t^H and B_t^A respectively. However, this benefit is only available when the person is actually in the country and when the person is eligible. Consequently, when working in A, expected income is

$$Y_t^A = (1-u_t^A)\alpha_t \delta_t^A E_0 + \varepsilon_t^A \sum_{j=1}^{t} l_{j-1}(1-u_{j-1}^A)a_{j-1} + u_t^A a_t B_t^A \tag{8}$$

while when working in H,

$$Y_t^H = (1-u_t^H)(1-a_t)\delta_t^H E_0 + \varepsilon_t^H \sum_{j=1}^{t}(1-l_{j-1})(1-u_{j-1}^H)(1-a_{j-1})$$
$$+ (1-a_t)B_t^H \tag{9}$$

with $t = 1, 2, ..., N$. The worker accumulates financial wealth as follows:

$$W_t = (1 + l_t i_t^A + (1-l_t)i_t^H)W_{t-1} + S_t \tag{10}$$

Initial financial wealth is exogenously given as W_0, which may be negative (e.g. in the case of the worker having incurred debt in gaining educational human capital E_0). Equation (10) allows for an effective after tax interest rate that depends on whether the worker resides and works in A or H. For example, a worker starting with negative financial wealth (a student loan) may have interest applied to the debt when in A, but not when in H (as is the case in New Zealand).

The optimisation model is fully specified once desired retirement wealth W_T is exogenously given and assumed to be feasible. Equations (1) to (10) describe a discrete time dynamic programming model of wealth accumulation with given initial and endpoint wealth, and the selection of vectors l, a and m to maximise the present value of utility (1). For given expected values of amenities, benefits from interaction with family and friends, returns to human capital and experience, migration costs, travel costs, unemployment rates and government policies (social security rates, taxes, etc) the optimal path could in principle be calculated numerically (e.g. Dreyfus and Law, 1977, p. 100-102). A formal mathematical analysis of optimal paths is beyond the scope of this paper, but will be an objective of future research. The optimal path evaluated at time 0 is denoted (l_0^*, a_0^*, m_0^*).

Optimal paths could be never to leave H (i.e., $l_0^* = [0, 0, \ldots, 0]$), to migrate to A and stay there (i.e., $l_0^* = [0, 1, 1, \ldots, 1]$), to migrate to A and eventually return to H (i.e., $l_0^* = [0, 1, \ldots, 1, 0, \ldots, 0]$), or more complex patterns. While working in one of the two countries, the optimal path is likely to involve nonetheless some time being spent in the other country (due to the benefits of amenities and personal interaction) while the optimal number of trips between the countries would be inversely related to trip cost.

Given suitable specification of the utility function, the first order conditions of the optimization problem will all be in the form of expressions for the marginal benefit of the optimal choice being equal to the marginal cost. More specifically, the optimal allocation of attachment is such that the marginal benefit of an additional day spent in A equals the value of marginal benefit of an additional day spent in H. This is shown diagrammatically in Figure 2. The marginal benefit gained from being in A, MB^A, declines with the proportion of time spent in A, while the marginal benefit of time spent in H, MB^H, increases when time spent in A increases. As such, it is possible to determine an optimal allocation of time, a*, which maximizes total utility, given optimal residence and travel.
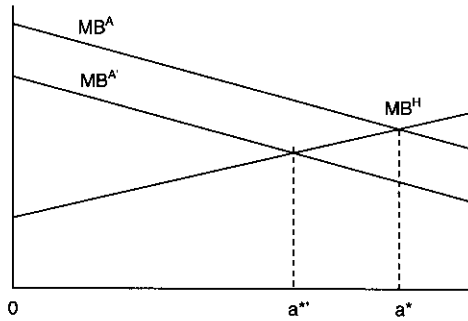
FIGURE 2. Optimal attachment to location A

Similarly, the optimal number of trips is such that the marginal benefit of an additional trip (which will be implicitly also a function of the selected level of attachment and the decision of where to work) is equal to the marginal cost $2\tau_i$. This is shown in Figure 3. The marginal cost of an additional trip is shown as an exogenous constant – the cost of flights, departure taxes and other associated costs are not dependent upon the number of trips made each year. Under the adopted assumptions, the total benefit of mobility TB is a concave function, implying that for any given proportion of time spent abroad, a greater frequency of short trips is preferred to a single long stay, but the marginal benefit of each additional trip is declining.

The optimal location path l_0^* determined in year $t = 0$ is such that any other possible permutation of work/residence locations yields an expected
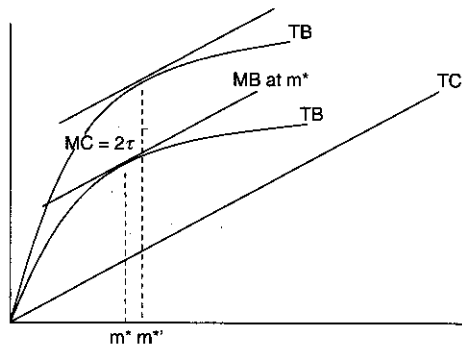

FIGURE 3. Optimal travel frequency

present value of utility that is less or at most equally high, given the information set available at the time when the initial optimal path is evaluated. However, changes in either the information set available or in actual external conditions may cause migrants to re-evaluate and alter their initial intentions.

The optimal choices are updated annually. Hence, in year 1, the optimal path becomes (l_0^*, a_1^*, m_1^*) and takes into account any new information. If no external conditions change, there will be time consistency, that is, workers will not deviate from their initially chosen optimal sequence of locations. However, if there are changes in conditions (such as an unexpected change in the unemployment rate in A or H), or if new information becomes available which alters the expected current and future utility paths, workers will adjust their plans of work location, attachment and travel accordingly. Any initially planned residence spell in A may then be curtailed or prolonged.

This theory suggests that a migrant's likelihood of return migration will change over time after initially better information is acquired (which may lead some to return) and subsequently on-the-job training and a growing stock of acquaintances leads to greater utility from staying. While migrants may have difficulty getting full information about employment and living conditions in the host country prior to arrival, it is likely that this knowledge will increase dramatically over a short time in the host country. In contrast, changes in the actual conditions in a country are likely to occur more gradually over time. As such, remigration decisions that are made within a short time after arrival are expected to be due to the acquisition of new information. Remigration in the longer term may be caused more by changes in actual conditions or may be part of a planned sequence of migratory moves. Planned return is unlikely to occur after short residence spells due to the fixed costs associated with migration itself. These considerations suggest that the likelihood of an onward or return migration is initially increasing with increasing duration of stay (as the number of revisions of initial migration plans will increase when more information is obtained), but at a later stage the propensity to remigrate may decline.

The decline in subsequent mobility is also due to the fact that migrants gain greater experience and both social and economic connections in their current location. As the balance of personal and economic locational capital shifts towards the current location, migrants will face a lower incentive to re migrate. Known as 'cumulative inertia' or '(negative) duration dependence' in the migration literature, this has often been

confirmed in empirical studies (e.g. Greenwood 1997). Put together, the information effect and the accumulation of location-fixed capital lead to an expectation of a concave-shaped hazard function. This is confirmed by the semi-parametric estimation of the hazard function in Section 5.

We can now also predict the impact of a change in social security eligibility on migration, attachment and travel. The rules of eligibility of New Zealand citizen in Australia have gradually been tightened. Before 1986 migrants were eligible upon arrival. Between 1986 and 2000, a six month 'stand down' period was introduced, which was then extended to a 24 month period between February 2000 and February 2001. Subsequently, automatic eligibility was revoked entirely. Effectively, this implies in the model above that $B_t^A = 0$ for $t \geq P$ with $0 < P < N$. The removal of the unemployment benefit in A reduces expected income in A. This lowers the likelihood of migration from H to A (which we cannot observe with our data) but increases the likelihood of return migration (which we do observe, as will be shown in Section 5). In addition, $\partial Y_t^A / \partial a_t$ will be somewhat smaller (see Equation 8). This lowers MB^A for given MB^H and therefore implies lower attachment to A. With the lower attachment, the marginal benefit of an additional trip to H has increased for a given income, but with lower expected income in A, trips become less affordable so that the overall effect is theoretically indeterminate. The empirical results will show that the frequency of trips back home in fact increases. This is equivalent to a rotation upwards of the MB curve in Figure 2, for given marginal trip costs, thus leading to greater travel.

In summary, in Section 5 of this paper we apply this theory to the mobility behaviour of UK and New Zealand migrants to Australia. We measure and model the hazard rate of repeat or return migration following an intention to settle for 12 months or more in Australia. The attachment to Australia and the number of trips out of Australia are also considered. We then assess the extent to which these various measures of international mobility are affected by the policy changes introduced by the Australian Government in 2001. However, first we describe and summarise the data in Section 4.

INTERNATIONAL MOBILITY DATA

Australian legislation requires all passengers who enter or leave Australia by airplane or ship to complete a passenger card. The cards include

questions about current travel itineraries as well as personal characteristics such as age and occupation. When a non-Australian resident arrives stating an intention to remain in Australia for 12 months or more, they are classified as a Permanent or Long-Term (PLT) migrant. Passenger card details are recorded in full for all PLT arrivals and are then integrated with details available from the Travel and Immigration Processing System (TRIPS), which records travellers' passport and visa information, including age, sex, and marital status. After new PLT arrivals have been captured in the sample all their subsequent moves into and out of Australia are fully documented, regardless of the intended or actual duration of each trip.

The full sample used in this paper includes all New Zealand and UK citizens whose first entry to Australia since the current electronic recording system began in July 1998 occurred over the period from August 1999 to July 2002, and who stated an intention to remain in Australia for at least 12 months. The sample is split into three one-year cohorts of new arrivals. These cohorts broadly align with the different phases of Australia's policy change with respect to New Zealand citizens. The first cohort, from August 1999 to July 2000, entered Australia under a system in which New Zealanders became eligible for social welfare assistance, could apply for Australian citizenship, and sponsor family members for permanent residence once they had been in the country for two years. The second cohort, from August 2000 to July 2001, covers those people who arrived over the period during which the policy change was being discussed, announced, and implemented. The final cohort covers only those people who arrived after the policy change had been fully implemented. Figure 4 below shows the timeline for data collection, and relates this to the changes in welfare policy.
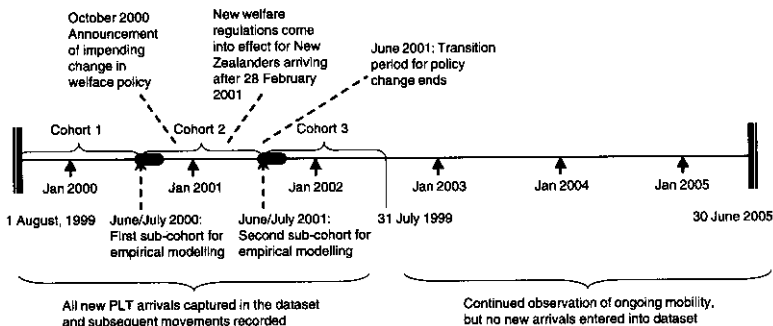

FIGURE 4. Timeline of data collection, policy changes, and empirical samples

A reduced sample is used for the multivariate empirical analysis of Section 5. The sub-sample takes two two-month cohorts of arrivals – those who arrived in June and July of 2000, before the announcement of the policy change, and those who arrived in June or July of 2001, after the policy change was fully implemented. This sub-sample was chosen to maximize the duration of time over which the migrants could be observed, while minimizing the differences between the two sub-cohorts due to either seasonal differences or changes in the overall environment by taking two periods exactly one year apart. In order to focus on the determinants of remigration among labour force participants, the sub-sample is restricted to those migrants who stated an intention to remain permanently in Australia, and for whom a main occupation could be determined under the Australian Standard Classification of Occupations (ASCO).

The full dataset covers a total of 221,188 people and 1,272,531 border crossings, either into or out of Australia. Among the 112,454 New Zealanders who migrated to Australia, 80,074 arrived as permanent settlers and 32,380 as temporary long-term residents. The total number of new arrivals from the UK was similar, but the composition very different, with 21,466 UK citizens arriving permanently and 87,268 as temporary migrants.

MODEL OF MIGRATION, ATTACHMENT AND TRAVEL

While differences across cohorts for New Zealand citizens suggest that there may indeed have been an effect from the policy change on the magnitude and composition of migration from New Zealand to Australia, the main focus of this paper is on changes in subsequent mobility patterns. The theoretical model outlined in Section 3 suggested that the increased risk associated with living in Australia without the safety net of publicly provided unemployment insurance is expected to increase the likelihood that New Zealand citizens choose to return home or to move on. Similarly, they may choose to make greater efforts to maintain connections with New Zealand, in order to benefit more from the ties they still have and facilitate later moves.

Secondary mobility is discussed first with respect to first arrival in Australia, looking at the length of time for which Australia remains the main residential location. Multivariate duration analysis is used to examine the effect of personal characteristics and the change in social welfare

eligibility on the probability of remigration among New Zealand citizens. A competing risks model is then used to determine the destination of New Zealand citizen departures – looking at whether those migrants who left Australia were returning to New Zealand or travelling on to a secondary destination. The degree of attachment which migrants have to Australia is then examined through statistical modelling of the proportion of time that new migrants spend away from Australia, and the number of overseas trips they make.

The concept of migration, as developed in Section 3, is defined in terms of a long-term change in residential location, associated with a change in the location of employment. According to their own stated intentions on arrival, all the migrants in the sample arrived in Australia planning to stay for a year or more. This is a significant period of time, and while a small number of these people may have come to Australia with sufficient funds to spend a year travelling, most will be expecting to find work in Australia or to be supported by other working family members. As such, the initial arrival of these people in Australia falls into the category of migration.

Due to the fluidity of moves into and out of Australia it is not possible to state when a person has 'permanently departed'. Remigration is therefore defined as a spell of at least six months out of the country, broken by no more than one short re-entry (defined as a re-entry spanning no more than one month transition). This prevents some of these people who spend most of their time outside Australia but return for regular short trips from being counted as resident in Australia.

Those people who arrived in the July 2001 cohort are observed over a period of only four years. In order to preserve consistency across the two sub-cohorts, it is therefore necessary to use a 48 month observation period for all the multivariate analysis. Although a six month time period does not accord with the official definition of long-term departure (which is 12 months), it allows for a greater coverage of the duration of time spent in the country. At the same time, it remains long enough that those who are observed to be outside the country can reasonably be assumed to have set up a residence in another country, rather than being on an extended vacation. Of all the completed spells away from Australia (that is, spells abroad which ended in a return to Australia) 88.9 % lasted 6 months or less. The longer observed spells away appear to be people who did not settle in Australia, or who departed and returned for a short visit some time later, rather than people who left for a period and then came back to live in Australia.

Using this definition of remigration, 46.7% of all migrants were counted as still being resident in Australia at the end of June 2005. In line with the difference in stated intentions, the relevant figures were 67.2% and 67.0% for New Zealand and UK permanent settlers, 47.8% for New Zealand long-term visitors, and 22.4% for UK visitors. Hence even among those migrants who intended to settle permanently, one third re migrated within four years.

Using the sub-sample, we now turn to an examination of the impact of personal characteristics and the social welfare policy change on the probability of remigration from Australia. This is done through the use of a set of techniques known as Duration Analysis or Survival Analysis. The central concept of survival models is that they focus not on the unconditional probability of an event occurring (e.g. the probability that a migrant will depart from Australia within a year of arrival) but rather on the instantaneous probability of departure conditional on survival until that time (e.g. the probability that a migrant will depart in the 12th month after arrival, given that they have remained resident in Australia for the preceding 11 months). Therefore, discussion of duration analysis is framed in terms of hazard functions, describing the conditional probability of departure at any given time. The hazard function is defined as $\lambda(t) = f(t)/S(t)$ where $f(t)$ is the number of departures at time t and $S(t)$ is the number of migrants who remain resident in Australia up to time t. The models can also be formulated in terms of unconditional or cumulative probabilities by looking at the survival rate over time – the proportion of all new arrivals who remain in Australia at a given duration after arrival; or at cumulative hazard rates – the cumulative probability of departure having occurred up until a given time. The benefit of a hazard function parameterisation is that it allows for the focus to be on the changing probability of departure at given durations.

Table 1 presents the results of a Cox Proportional Hazards model for the duration of time before remigration among permanent settlers. The Cox model is based on the assumption that there is an underlying probability of departure at any given time, $\lambda_0(t)$, which is scaled proportionately according to a vector of explanatory variables, x, representing individual characteristics and environmental changes, with unknown coefficients, β, which have a multiplicative effect on the baseline hazard function. The overall hazard function is therefore expressed as $\lambda(t, x, \beta, \lambda_0) = \phi(x, \beta)\lambda_0(t)$, with the factor ϕ commonly specified as $\phi(x, \beta) = \exp(x, \beta)$.

TABLE 1. Cox proportional hazard estimates

Variable	NZ Permanent Settler		UK Permanent Settler	
	Coeficient	Std. Err.	Coeficient	Std. Err.
Semi-skilled	0.026	0.063	−0.249 **	0.113
Low-skilled	0.012	0.094	−0.482	0.339
Age	−0.073 ***	0.009	0.003	0.021
Age squared	0.002 ***	0.000	0.000	0.001
Non-native	−0.329 ***	0.079	0.596 **	0.149
Female	0.013	0.059	0.121 *	0.106
Cohort	0.182 ***	0.059	−0.212 **	0.104
N	3473		1111	
Number of Failures	1152		359	
Log-likelihood	−9109.68		−2447.87	
$\chi^2(7)$	152.01		33.47	

Significance levels: * 10% ** 5% *** 1%

In order to get consistent figures for comparing departure rates, each monthly cohort is observed over the same duration since arrival. As the last sub-cohort of arrivals can be observed for a maximum of 48 months, this reduced observation period is used for all arrivals. For example, those who arrived in June 2000 are observed only up until the end of May 2004. As the baseline hazard is estimated at a zero value of the covariates, the age variable is normalised so that the baseline hazard is estimated for migrants in the 20 - 25 year age group. Robust standard errors are reported throughout.

After controlling for compositional effects, the results show a significant difference in the duration of stay in Australia of 'permanent' New Zealand migrants who arrived before and after the policy change. Individuals who arrived in the later cohort are estimated to have a 20% higher probability of departure at any given time than an identical migrant from the earlier cohort. In contrast, the probability of departure among UK permanent settlers was lower for the later cohort. If it is assumed that, absent the change in welfare policy, New Zealand migrants would have experienced a similar change in hazard rates over time as the UK migrants, a comparison of the difference between the two coefficients gives an estimate of the total effect of the policy change. In this case, the difference-in-differences estimator is exp (0.182−(−0.212)) = 1.48, and statistically significant at the one % level. That is, the policy change appears to have increased the instantaneous probability of departure among New Zealand

settlers by almost 50 %. Other factors which show up as important determinants of the probability of remigration include age, which for New Zealanders has a non-monotonic relationship with the conditional probability of departure, with the lowest hazard rates being among those people in their thirties, the years when many people are starting families. Birthplace is also an important explanatory factor, but has different effects for New Zealanders and UK Citizens. Among UK settlers, the relationship between birthplace and remigration propensity follows the expected pattern – those people who have already made at least one international move are more likely to remigrate from Australia. In contrast, non-native born New Zealand citizens show a lower propensity for remigration. This adds some support to the Australian contention that some migrants use New Zealand as a 'back-door' entry point for migration to Australia – taking advantage of New Zealand's less restrictive migration policies to gain first permanent residence, then citizenship, with the attending right to live and work in Australia. Having reached Australia they then settle down and do not leave again.

As the sample used for the model reported in Table 1 is constructed only of those who initially intended to remain permanently in Australia, all those who depart have experienced a change of mind over the intervening period. As noted in Section 3, this may occur either due to a change in external circumstances or a change in the information set available to migrants. Figure 5 plots the estimated baseline hazard functions for the two groups of migrants. The non-monotonic shape of these functions, with a more pronounced peak for the UK migrants, suggests that information effects may indeed play an important role in the remigration decision. Both UK and UK migrants have a relatively high probability of remigration in the early months after arrival. This probability is stronger among UK migrants, who presumably have less premigration information about their new host country, due to the greater distance between source and host countries. Over time, the probability of migration falls, as migrants are sorted into those who have good outcomes in Australia, and these migrants build up productive locational capital and personal relationships.

From the source country perspective, the question of how long New Zealand emigrants remain in Australia is perhaps of secondary importance to the question of whether those who depart return to their country of origin or move on to an alternative destination. Table 2 reports the results of a competing risks proportional hazard model, examining the differences among three groups of New Zealand settlers: those who remain in
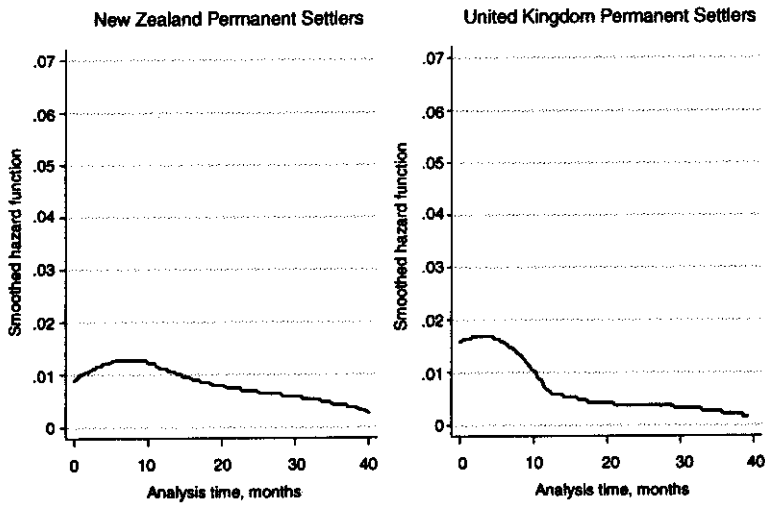
FIGURE 5. Estimated baseline hazard functions, cox proportional hazards model

TABLE 2. Competing risks analysis

Variable	NZ Permanent Settler Coef.	Std. Err.
Semi-skilled	–0.019	0.091
Low-skilled	–0.060	0.148
Age	–0.056 ***	0.013
Age Squared	0.001 **	0.000
Non-native	–0.570 ***	0.125
Female	0.142 *	0.086
Cohort	0.545 ***	0.085
Semi-skilled*type	–0.557 **	0.265
Low-skilled*type	–1.194 **	0.545
Age*type	–0.109 ***	0.037
Age squared*type	0.003 **	0.001
Non-native*type	1.179 ***	0.279
Female*type	–0.370	0.249
Cohort*type	0.086	0.243
Type	–1.371 ***	0.442
N	3692	
Number of Failures	636	
Log-pseudolikelihood	–4813.20	
$\chi^2(15)$	386.27	

Australia; those who return to New Zealand; and those who move on to other countries.

Identifying the destination of departing migrants is somewhat complicated as only those migrants who state that they are 'residents of Australia departing permanently' are asked to give a country of next permanent residence (CNPR). As many departures class themselves as 'visitors' in Australia (despite their earlier assertion that they intended to settle permanently), this means that response rates for the question on CNPR are very low. However, by combining migrant responses to CNPR with their response to 'country of disembarkation from this flight' it is possible to get a reasonably good response rate for the destination of New Zealand migrants. Due to their relative geographic positions, it seems reasonable to assume that travellers departing from Australia and disembarking in New Zealand will have New Zealand as their main destination. This analysis cannot be performed for UK migrants, as the recorded country of disembarkation for migrants travelling to the northern hemisphere will generally be a stopover, rather than their intended destination.

Departing migrants who gave neither an intended country of next permanent residence nor a country of disembarkation are excluded from the analysis. In order to redress the balance between stayers (who are overrepresented in the remaining sample, due to the exclusion of those who departed without giving an intended destination) and re migrants, a random selection of just under half of the stayers were also excluded from the sample. This is justifiable under the assumption that there were no systematic differences between those who did and those who did not state an intended destination on departure from Australia. The resulting sample consists of 1,846 permanent settlers, of whom 1,210 remained resident in Australia throughout the four year observation period, 558 returned to New Zealand, and 78 left Australia for a third destination.

The formulation of the model shown in Table 2 assumes that individual characteristics will impact differently on the conditional probability of return than on the conditional probability of an onward move, but restricts the underlying shape of the baseline hazard function to be the same for both types of departure. An additional variable, type, is added to capture the different base probability of an onward move, relative to a return move. Type is a binary variable equal to zero for return moves and one for onward moves. As such, the coefficient of –1.371 associated with the type variable suggests that for the average migrant, the probability

of an onward move is around exp $(-1.371) = 25$ % of the probability of a return to New Zealand.

The basic coefficients relate to the probability of return migration, while the coefficients on the interaction terms show how the probability of departure differs from the base when the event in question is onward migration, rather than return. The coefficient of 0.545 on the cohort variable suggests that those migrants who arrived in the June/July 2001 cohort have a probability of departure at any given duration of stay exp $(0.545) = 1.72$ times that of those from the earlier cohort. The lack of significance of the interaction between cohort and type suggests that being in the latter cohort does not have a differential effect on the probability of an onward move, relative to a return.

Where interaction terms are significant, the relative probability of an onward move associated with the characteristic in question can be calculated by adding the exponentiated coefficient on the basic variable to that of the interacted variable. For example, the probability of return among the non-native born is only exp $(-0.570) = 0.57$ times that of the New Zealand born, while the relative probability of an onward move is exp $(-0.570 + 1.179) = 1.84$. That is, the non-New Zealand born have an 84 % higher probability of departing for a secondary destination, and a probability of returning to New Zealand 43 % lower than that of the New Zealand born. This suggests that the non-New Zealand born have weaker attachments to New Zealand, perhaps combined with continuing attachments to their country of birth. Alternatively, they may also have a greater preference for travel and new residential locations.

Occupational skill also came out as an important determinant of remigration destinations, with higher skill levels being associated with a greater probability of onward migration. Skilled migrants are likely to be more internationally mobile due to both a more globalised labour market in skilled occupations, better skills for gathering and processing information about opportunities in other locations and also as they are less likely to face restrictive immigration barriers to entering other countries than unskilled workers. Age had a non-monotonic relationship with both onward and return migration, while females showed a slightly higher probability of return migration than males. After accounting for the variance in both the base and interaction variable there is no evidence for a gender difference in the probability of onward migration. The baseline hazard function is shown in Figure 6 and again suggests a non-monotonic relationship between the duration of stay and the instantaneous probability of departure.
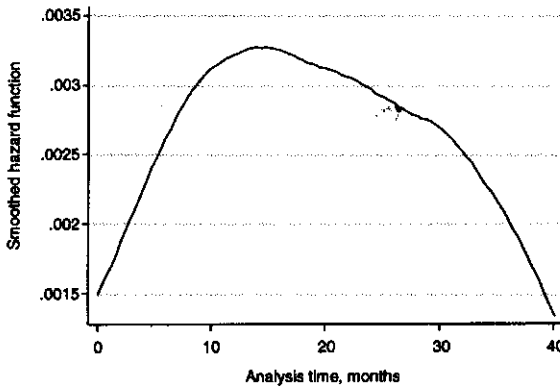
FIGURE 6. Estimated baseline hazard function, competing risks model

Alongside the questions surrounding actual duration of stay, the DIMIA dataset also provides valuable information about the ongoing mobility patterns of new migrants to Australia. One of the main features of the dataset is that is records the details of every move that individuals make, both into and out of the country. As such, it is particularly useful for studying the way in which new migrants allocate their time between Australia and other countries, and the patterns of international mobility through which they maintain ongoing international connections.

Focusing on those migrants who remained resident in Australia throughout the observation period, Figure 7 shows the proportion of time that new migrants actually spent onshore over their first four years after arrival – that is, their cumulative attachment to Australia (see also, e.g., equations 4 and 5 of the theoretical model). Among those migrants who were not observed to remigrate from Australia, 99 % spent over three quarters of their time onshore.

Table 3 considers the determinants of attachment of those migrants who remained resident in Australia. The results show that skill levels are important in determining the proportion of time which new migrants spend onshore, with higher skill levels being associated with lower attachment to Australia. Cohort effects are again important for the New Zealand settlers, but not for the UK citizens, and suggest that the change in social welfare policy indeed had the anticipated effect of reducing observed attachment to Australia.

Table 3 turns the focus to the extent of international travel among those who remain resident in Australia. Clearly, travel rates are closely
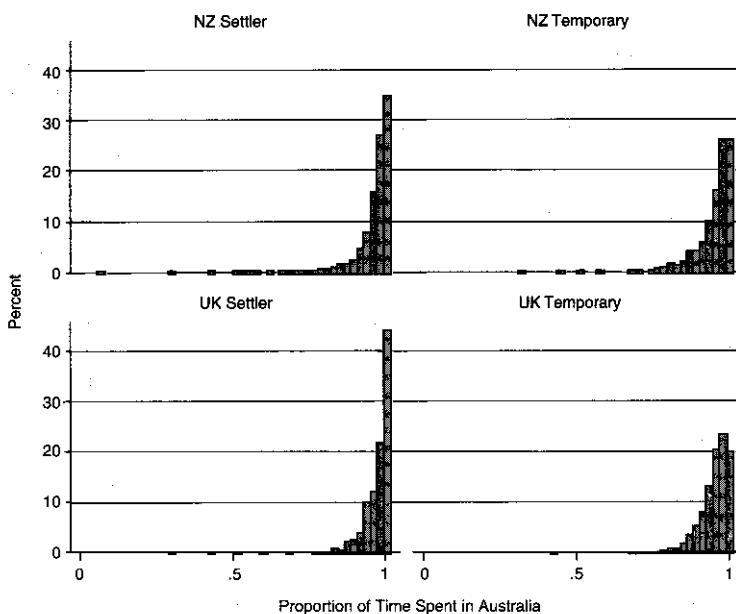
FIGURE 7. Histogram of cumulative attachment to Australia, four year observation period, Australian residents only

TABLE 3. OLS regression of attachment rate, Australian residents only

Variable	NZ Permanent Settler		UK Permanent Settler	
	Coeficient	Std. Err.	Coeficient	Std. Err.
Semi-skilled	0.015 ***	0.003	0.014 ***	0.004
Low-skilled	0.018 ***	0.003	0.021 ***	0.005
Age	0.001 ***	0.000	0.001	0.001
Age squared	0.000 ***	0.000	0.000 *	0.000
Non-native	0.004	0.003	−0.007	0.009
Female	−0.003	0.002	−0.001	0.004
Cohort	−0.006 **	0.003	0.003	0.004
Intercept	0.955 ***	0.005	0.952 ***	0.009
N	3473		1111	
R^2	0.04		0.04	
F(7,3465/1103)	18.69		5.04	

interrelated with overall attachment levels – those people who choose to spend more time abroad will naturally be expected to make more overseas trips. In order to control for the proportion of time that migrants choose to spend abroad, while reducing the problem of endogeneity associated with the relationship between attachment to Australia and the travel frequency, the dependent variable in the model is the number of exits made over the last three years of observation, while attachment to Australia in the first year after arrival is used as an instrument for the overall degree of attachment. Attachment to Australia is found to have a strong and significant negative relationship to international mobility in the following periods.

After controlling for the total proportion of time spent out of the country, cohort effects are significant for New Zealand citizens but not for UK citizens, with those New Zealanders who arrived after the policy change being more likely to travel internationally. It may be that even within the group who choose to make Australia their main base, those people who arrived after the policy change have a greater incentive to maintain connections with their home countries, having less attachment to Australia and a greater probability of eventual return.

Distance and travel costs also appear to play an important role in determining travel frequency. This is implied by the comparison of travel frequency between New Zealand and UK citizens, and between native born and non-native born New Zealanders. Using the intercept terms to compare basic travel frequency shows that New Zealanders tend to make more trips on average than their UK counterparts. This reflects the greater expense involved in travelling 'home' when the source country is more distant. At the same time, non-native born New Zealanders show lower travel frequency than the native born, as the non-native born are more inclined to travel to more distant destinations rather than back to New Zealand. In contrast, there is no significant difference in the travel frequency of UK citizens according to birthplace. While the distance between home and host countries is generally greater for the UK citizens, the non-native born do not systematically live in more distant locations than the native born, as is the case for New Zealand.

The positive relationship between skill levels and travel frequency is strong and consistent across the migrant groups. Those in skilled occupations are likely to have higher disposable incomes, and hence greater opportunities to travel overseas for personal reasons, as well as a higher likelihood of work-related international travel.

TABLE 4. Negative binomial regressions for number of trips away in years 2-4, Australian residents

Variable	NZ Permanent Settler Coeficient	Std. Err.	UK Permanent Settler Coeficient	Std. Err.
Semi-skilled	−0.472 ***	0.050	−0.695 ***	0.102
Low-skilled	−0.612 ***	0.067	−0.837 ***	0.216
Age	−0.002	0.007	−0.010	0.021
Age Squared	0.000	0.000	0.001	0.001
Non-native	−0.330 ***	0.064	0.076	0.181
Female	0.023	0.044	0.105	0.105
Cohort	0.227 ***	0.049	0.120	0.109
Attachment in first year	−3.911 ***	0.331	−3.522 ***	0.574
Intercept	4.701 ***	0.084	3.723 ***	0.207
Alpha	0.568 ***	0.042	0.819 ***	0.126
N	2321		752	
Log pseudolikelihood	−4694.78		−1206.86	
×2(8)	557.26		105.60	

Significance levels: * : 10% ** : 5% *** : 1%

CONCLUSION

In this paper we focused on the international mobility of New Zealand migrants to Australia. This topic is of interest for public policy in both countries, given that the number of New Zealand citizens residing in Australia has increased markedly in recent decades and more than one out of ten New Zealanders now lives across the Tasman Sea. The available data to study migration incidence and spells are more limited than in, for example, European countries that maintain population registration systems. Nonetheless, longitudinal information on arrivals and departures by individuals permitted an assessment of the likelihood of remigration of New Zealand migrants to Australia, their attachment to that country, and their international travel. To assess the impact of the removal of eligibility to labour market-related social security in Australia to visa-free trans-Tasman migrants, United Kingdom migrants acted as a control group.

We found that of New Zealand migrants who came to Australia to settle permanently, one third remigrated within four years, but this proportion is almost the same for those from the United Kingdom.

However, the impact of the policy changes on the hazard rate of the mobility process is quite high: the difference-in-differences estimator suggested a 50 % increase on the hazard rate of remigration among New Zealanders. No difference was detected in the impact on onward and return moves, but settlers arriving after the policy changes had lower attachment to Australia and made more trips away. It also appears that this policy, which intended to discourage 'back-door' migration via New Zealand of persons not meeting immigration criteria to settle in Australia, indeed achieved this objective.

The present analysis can be extended in various ways. The most obvious is that it would be helpful to extend the data to a longitudinal sample of a decade or longer. This would permit the more conventional definition of remigration, i.e. a spell away of twelve months or more. With the longer observation period, it would also be possible to take account of place (home and host country) rather than just person characteristics. The omission of the former is justified in the present analysis by the observation that over the short time span considered relative economic conditions in the UK, Australia and New Zealand did not change much.

Another extension is to contrast migrants' intention as stated on their arrival and departure cards with actual outcomes. The analysis of causes of prolonging or curtailment of trips is only appropriate for long-term visitors rather than permanent settlers and has not been considered here (but see Sanderson 2006).

A further extension, possible with longer time-spans is to consider how travel and attachment affect subsequent remigration decisions. Is an increased frequency of trips home simply an income elastic response to successful settlement, or an investment that will pay off in a subsequent return migration?

It is clear that the information available from arrival and departure cards is very limited. Further in-depth analysis of migrant behaviour would certainly benefit from an in-depth survey of randomly selected new settlers, ideally followed up by subsequent interviews to maintain the information longitudinally.

Finally, some recent research using New Zealand international movement data suggests that remigration of new settlers in New Zealand is much higher the propensity of New Zealanders to emigrate (Shorland, 2006). A comparison and analysis of international mobility patterns of the native born and migrants in both Australia and New Zealand also remains a potentially fruitful avenue for further research.

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